Test Report

Verified code: 181556

Report No.: E20240827121501-4EN

Customer:	GUANGZHOU RANTION TECHNOLOGY CO., LTD.
Address:	Room 7002 and 7003,7th Floor,Digital Entertainment Industrial Park,Greater Bay Area,No. 28 Huangpu Park West Road,Huangpu District,Guangzhou,China.
Sample Name:	Donner OURA Piano
Sample Model:	R300
Receive Sample Date:	Sep.09,2024
Test Date:	Sep.14,2024 ~ Nov.18,2024
Reference Document:	47 CFR, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
Test Result:	Pass

Prepared by: Wen Wenwen Reviewed by: Jiang Tao Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-12-02

Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.

2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. This testing report is only for scientific research, teaching, internal quality control, etc.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20240827121501-4EN	Original Issue	2024-11-26

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1. TEST RESULT SUMMARY

47 CFR, FCC Part 15 Subpart C 15.247，ANSI C63.10-2020 KDB 558074 D01 15.247 measurement guidance v05r02			
Standard	**Item**	**Limit / Severity**	**Result**
47 CFR, FCC Part 15 Subpart C (15.247)	Antenna Requirement	Section 15.203	PASS[1)]
	20dB Bandwidth	Section 15.247(a)(1)	PASS
	Carrier Frequencies Separated	Section 15.247(a)(1)	PASS
	Hopping Channel Number	Section 15.247(a)(1)(iii)	PASS
	Dwell Time	Section 15.247(a)(1)(iii)	PASS
	Maximum Peak Output Power	Section 15.247(b)(1)	PASS
	Conducted Emission	Section 15.207	PASS
	Conducted band edges and Spurious Emission	Section 15.209 &15.247(d)	PASS
	Radiated Spurious Emission	Section 15.209 &15.247(d)	PASS
	Restricted bands of operation	Section 15.247 (d) &15.205	PASS

Note:

1) The antenna is PCB printed antenna. The max gain of antenna is 1.9dBi.which accordance 15.203.is considered sufficient to comply with the provisions of this section.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	GUANGZHOU RANTION TECHNOLOGY CO., LTD.
Address:	Room 7002 and 7003,7th Floor,Digital Entertainment Industrial Park,Greater Bay Area,No. 28 Huangpu Park West Road,Huangpu District,Guangzhou,China.

2.2 MANUFACTURER

Name:	GUANGZHOU RANTION TECHNOLOGY CO., LTD.
Address:	Room 7002 and 7003,7th Floor,Digital Entertainment Industrial Park,Greater Bay Area,No. 28 Huangpu Park West Road,Huangpu District,Guangzhou,China.

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name:	Donner OURA Piano
Product Model:	R300
Trade Name:	DONNER
Additional Model:	S100, R100, S200, R200, S300, S400, R400
Model difference descriptions:	The main model no. R300 and the family models no. S100, R100, S200, R200, S300, S400, R400 have the same technical construction-including circuit-diagram, PCB-LAYOUT, hardware version and software version identical, the model names are different, which does not affect electromagnetic compatibility and electrical safety performance.
Power Supply:	DC 12V by adapter
Adapter:	Model: GQ36-120300-AX Input: 100-240V~ 50/60Hz 1.0A Max, Output: 12V ⎓ 3.0A 36.0W
FCC ID:	2AV7N-OURA
Transmit Power:	GFSK: -2.11dBm π/4-DQPSK: -0.52dBm 8DPSK: -0.30dBm
Type of Modulation:	FHSS (GFSK for 1Mbps, π/4-DQPSK for 2Mbps,8DPSK for 3Mbps)
Antenna Type:	PCB printed antenna with 1.9dBi (Max.)
Temperature Range:	0℃ ~ 38℃
Hardware Version:	V1.1
Software Version:	V1.1
Sample No:	E20240827121501-0001, E20240827121501-0002
Note:	The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions. After evaluated the difference descriptions of the

models, the test model is R300.

2.4 TEST OPERATION MODE

Mode No.	Description of the modes
1	Bluetooth(BT) fixed frequency transmitting

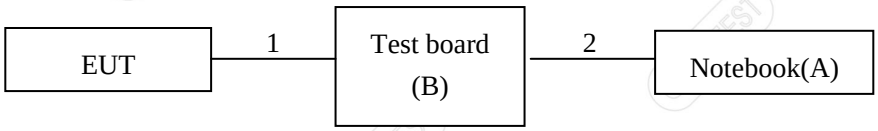
2.5 LOCAL SUPPORTIVE

No.	Name of Equipment	Manufacturer	Model	Serial Number
A	Notebook	DELL	Latitude3300	2C6CFW2
B	Test board	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	Serial cable	1	No	0	0.2m
2	USB cable	1	No	0	1.0m

Note: The notebook is just used to produce fixed frequency transmitting.

2.6 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

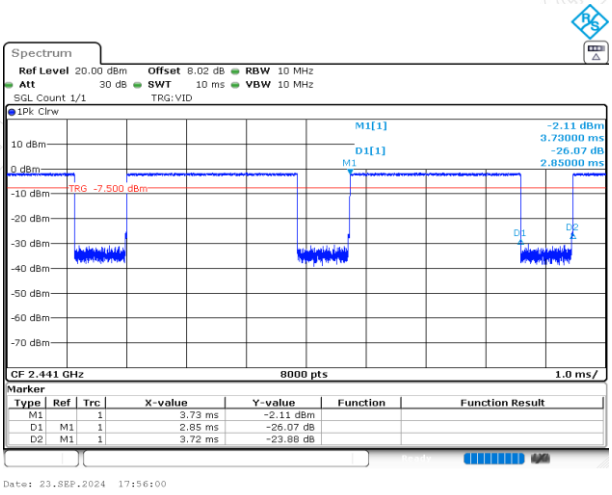
Software version	Test level
FCC_V2.24	0

2.7 DUTY CYCLE

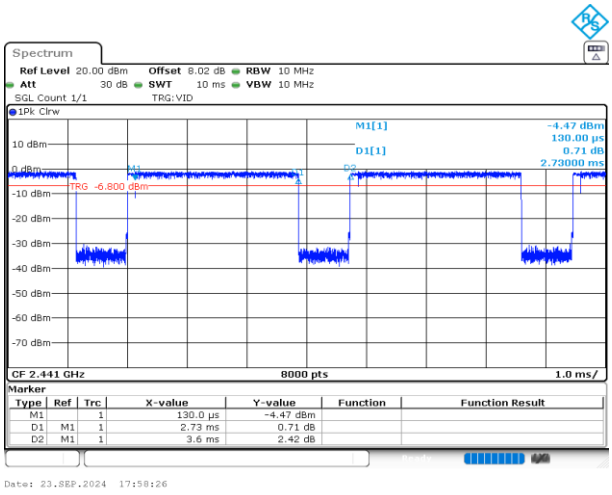
Environment: 20.1℃/68%RH/101.0kPa Voltage: AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-23

TestMode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	DC [%]	T [s]
DH5	Ant1	2441	2.85	3.72	76.61	0.00285
2DH5	Ant1	2441	2.73	3.60	75.83	0.00273
3DH5	Ant1	2441	2.73	3.59	76.04	0.00273

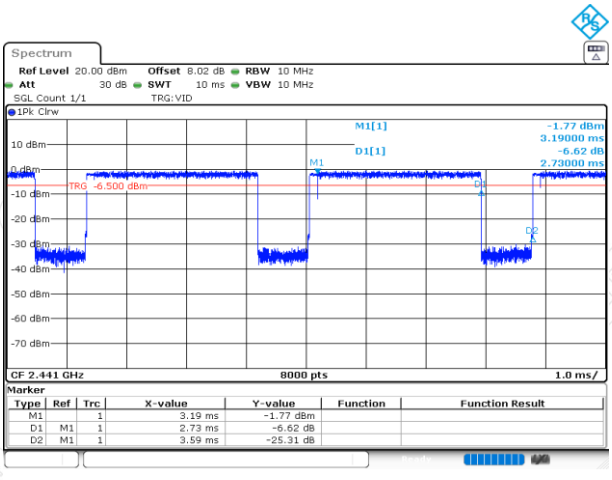
DH5_2441MHz



2DH5_2441MHz



3DH5_2441MHz



3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add	:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China
P.C.	:	518110
Tel	:	0755-61180008
Fax	:	0755-61180008

3.2 ACCREDITATIONS

Our laboratoriesare accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA	A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	X	9kHz～30MHz	4.4dB[1)]
	Y	9kHz～30MHz	4.4dB[1)]
	Z	9kHz～30MHz	4.4dB[1)]
	Horizontal	30MHz～200MHz	4.6dB[1)]
		200MHz～1000MHz	4.8dB[1)]
		1GHz～18GHz	5.0dB[1)]
		18GHz～26.5GHz	5.2dB[1)]
	Vertical	30MHz～200MHz	4.7dB[1)]
		200MHz～1000MHz	4.7dB[1)]
		1GHz～18GHz	5.1dB[1)]
		18GHz～26.5GHz	5.4dB[1)]
Conduction Emission		150kHz～30MHz	3.3dB[1)]

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.40 dB
Unwanted emission, conducted	0.68 dB
Humidity	6.00 %
Temperature	2.0℃

Note:

[1)] This uncertainty represents an expanded uncertainty expressed at approximately the 95%. This uncertainty represents an expanded uncertainty factor of k=2.

4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Hopping Channel Number & Dwell Time & 20 dB Bandwidth & Conducted band edges and Spurious Emission & Carrier Frequencies Separated				
Spectrum Analyzer	R&S	FSV30	1321.3008K30 -104381-rH	2024-10-13
Automatic control unit	TONSCEND	JS0806-2	2018060317	2025-07-20
BT/WIFI System	Tonscend	JS1120-3		
Radiated Spurious Emission&Restricted bands of operation				
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3402	2025-09-11
Loop Antenna	Schwarzbeck	FMZB 1513-60	1513-60-56	2025-05-07
Horn Antenna	Schwarzbeck	BBHA 9120D	02143	2025-06-15
Test Receiver	R&S	ESR26	101758	2025-09-10
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2025-08-24
Amplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G40	20200928001	2025-01-30
Amplifier	Tonscend	TAP01018048	AP20E8060075	2025-03-01
Amplifier	Tonscend	TAP184050	AP20E806071	2025-03-01
Amplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2025-07-19
Test S/W	Tonscend	JS32-RE/5.0.0	/	/
Maximum Peak Output Power				
Pulse power sensor	Anristu	MA2411B	1126150	2025-01-11
Power meter	Anristu	ML2495A	1204003	2025-01-11
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2025-07-19
LISN(EUT)	R&S	ENV216	101543	2025-07-10
Test S/W	EZ	CCS-3A1-CE		

Note: The calibration interval of the above test instruments is 12 months.

5. TEST RESULTS

5.1 E.U.T. TEST CONDITIONS

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	**2402**	14	2416	28	2430
1	2403	15	2417	29	2431
2	2404	16	2418	30	2432
3	2405	17	2419	31	2433
4	2406	18	2420	32	2434
5	2407	19	2421	33	2435
6	2408	20	2422	34	2436
7	2409	21	2423	35	2437
8	2410	22	2424	36	2438
9	2411	23	2425	37	2439
10	2412	24	2426	38	2440
11	2413	25	2427	**39**	**2441**
12	2414	26	2428	40	2442
13	2415	27	2429	41	2443

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	2444	55	2457	68	2470
43	2445	56	2458	69	2471
44	2446	57	2459	70	2472
45	2447	58	2460	71	2473
46	2448	59	2461	72	2474
47	2449	60	2462	73	2475
48	2450	61	2463	74	2476
49	2451	62	2464	75	2477
50	2452	63	2465	76	2478
51	2453	64	2466	77	2479
52	2454	65	2467	**78**	**2480**
53	2455	66	2468		
54	2456	67	2469		

Test frequency is the lowest channel: 0 frequency(2402MHz), middle channel: 39 frequency (2441MHz) and highest channel: 78 frequency(2480MHz)

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6. 20dB BANDWIDTH

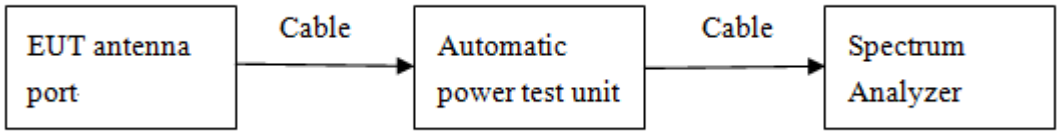
6.1 LIMITS

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.

6.2 TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW=30kHz, VBW=100kHz, Span=3MHz, Sweep = auto. Allow the trace to stabilize, record 20dB bandwidth value
3) Repeat until all the test channels are investigated.

6.3 TEST SETUP



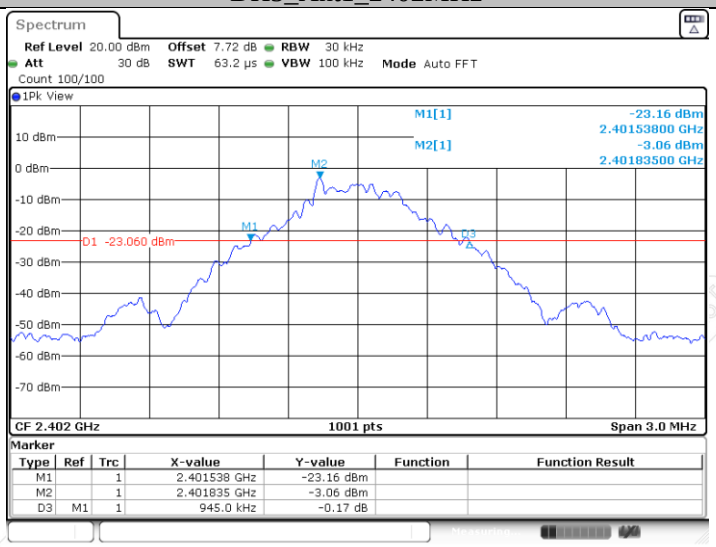
6.4 TEST RESULTS

Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-14

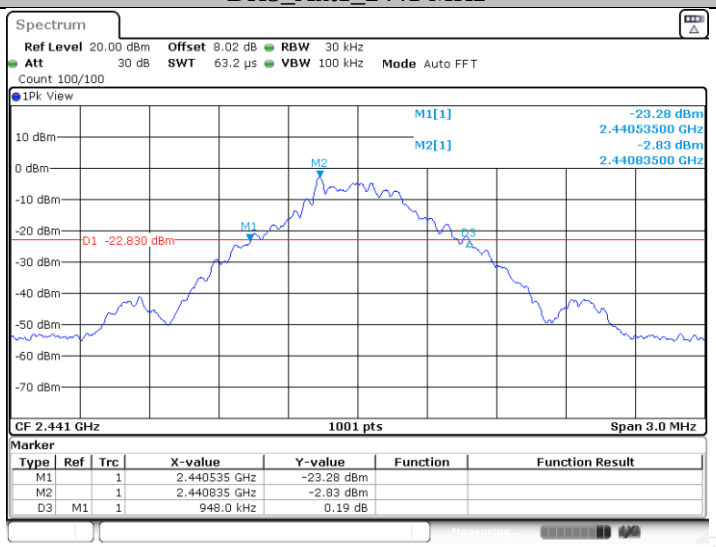
Test mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
DH5	Lowest	2402	945
	Middle	2441	948
	Highest	2480	948
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
2DH5	Lowest	2402	1281
	Middle	2441	1278
	Highest	2480	1278
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
3DH5	Lowest	2402	1251
	Middle	2441	1248
	Highest	2480	1248

Result plot as follows:

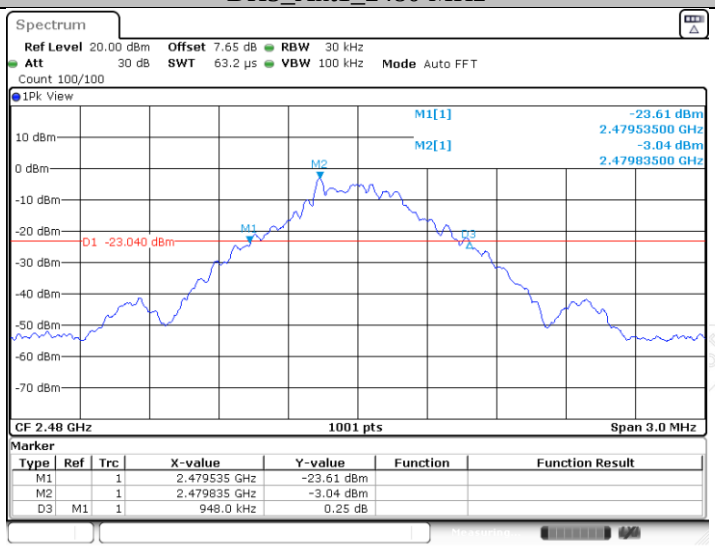
DH5_Ant1_2402MHz



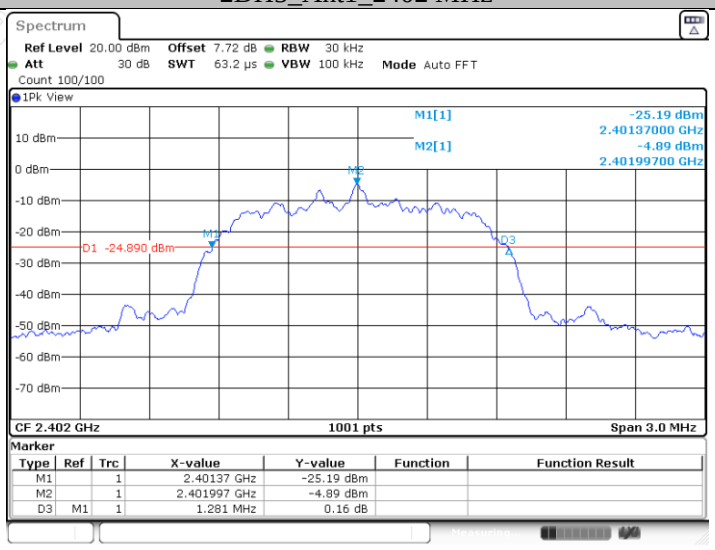
DH5_Ant1_2441 MHz



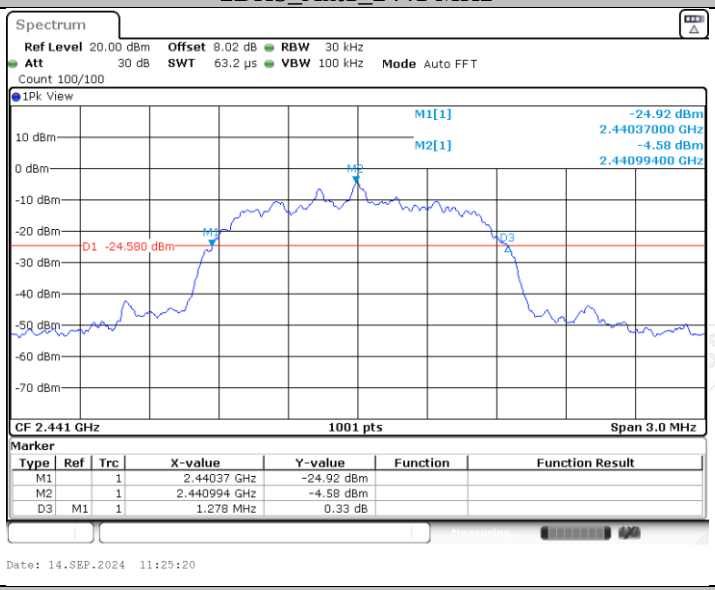
DH5_Ant1_2480 MHz



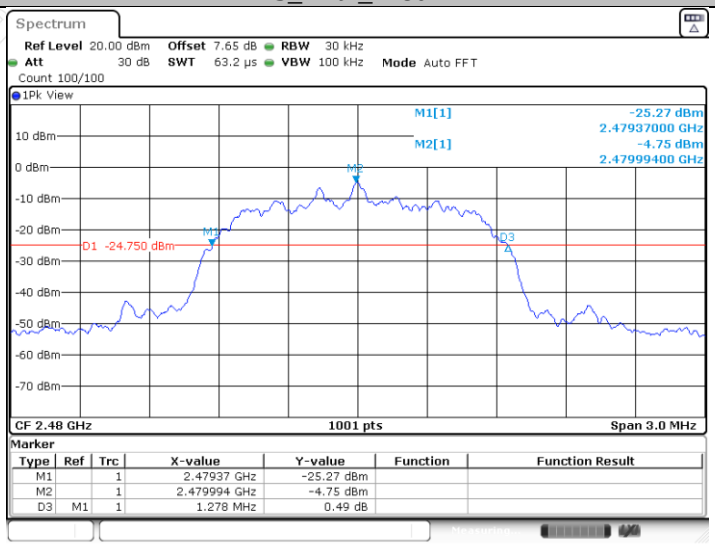
2DH5_Ant1_2402 MHz

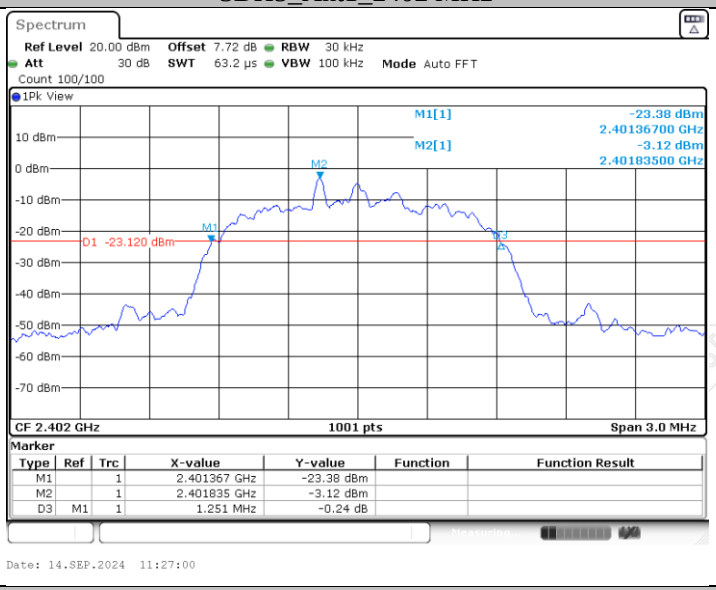


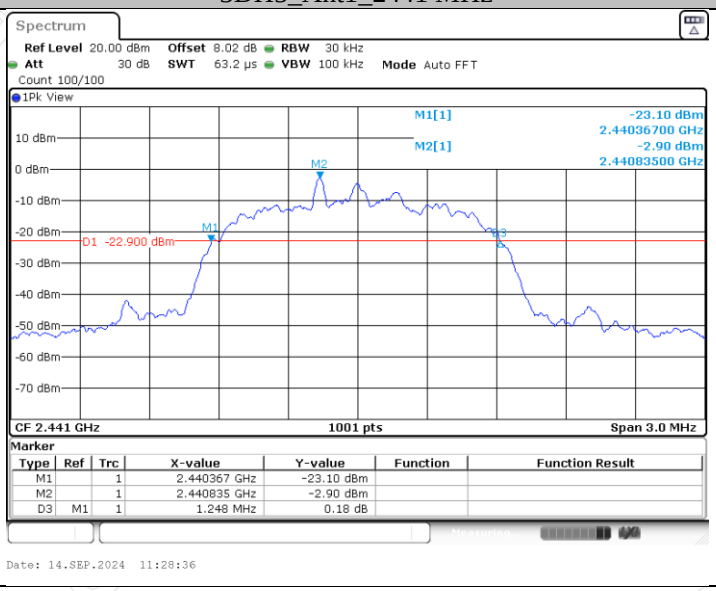
2DH5_Ant1_2441 MHz

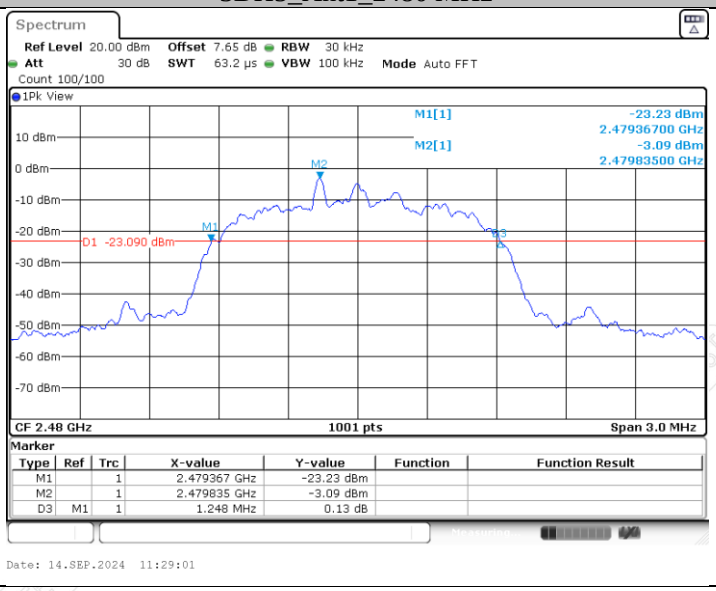


2DH5_Ant1_2480 MHz



3DH5_Ant1_2402 MHz


3DH5_Ant1_2441 MHz


3DH5_Ant1_2480 MHz


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7. CARRIER FREQUENCIES SEPARATED

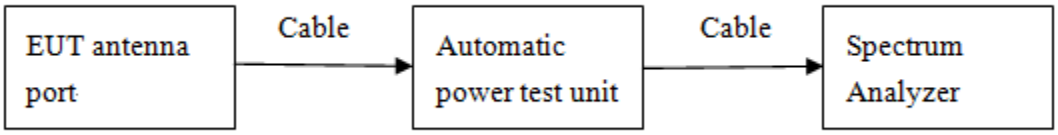
7.1 LIMITS

1) 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.

7.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set center frequency of spectrum analyzer = middle of hopping channel.
3) Set the spectrum analyzer as RBW=100kHz, VBW=300kHz, Adjust Span to 2MHz, Sweep = auto
4) Use the marker-delta function to markhopping channel carrier frequencies and record the channel separation.

7.3 TEST SETUP



7.4 TEST RESULTS

Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-14

DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.003	632	> Two-thirds of the 20 dB Bandwidth	Pass

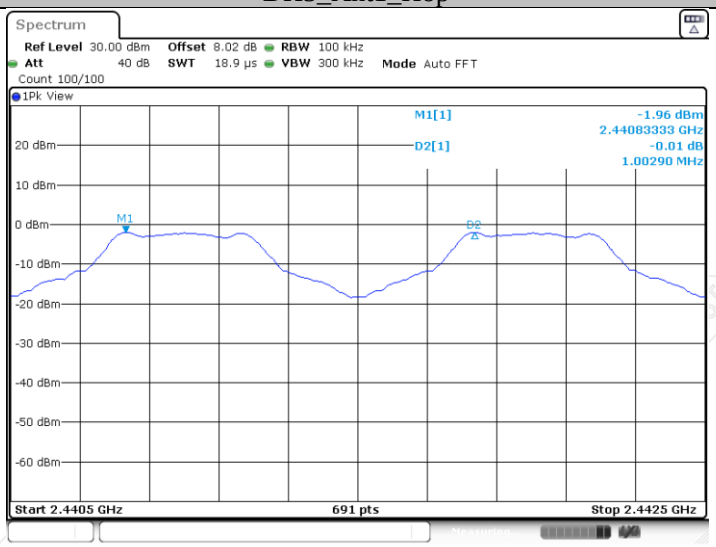
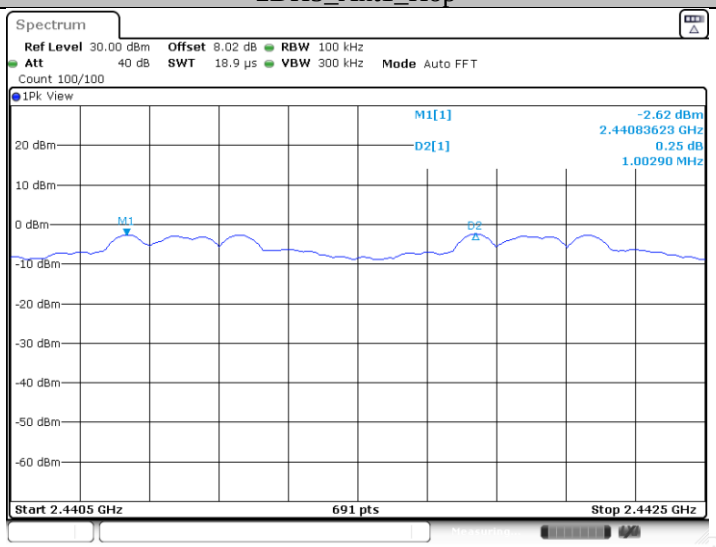
2DH5

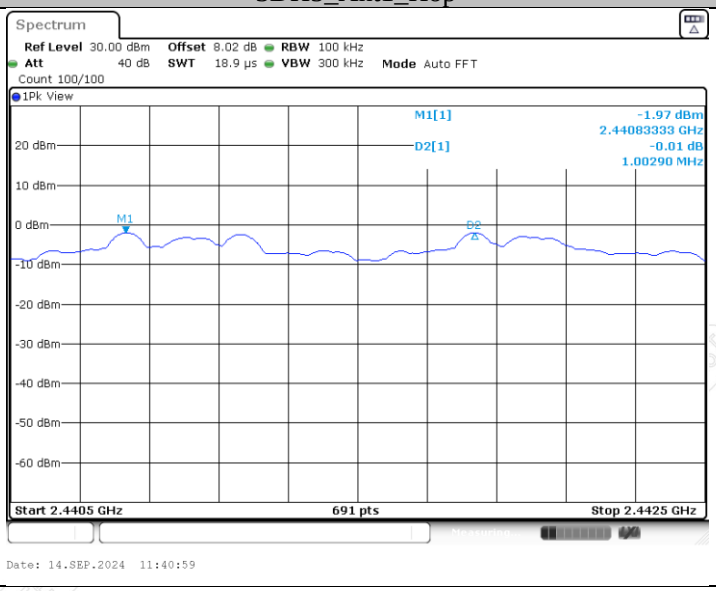
Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.003	854	> Two-thirds of the 20 dB Bandwidth	Pass

3DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.003	834	> Two-thirds of the 20 dB Bandwidth	Pass

Result plot as follows:

DH5_Ant1_Hop

2DH5_Ant1_Hop


3DH5_Ant1_Hop


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8. HOPPING CHANNEL NUMBER

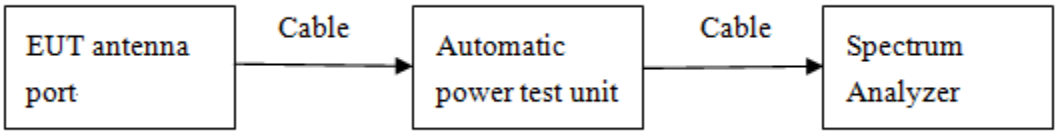
8.1 LIMITS

Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

8.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW=100kHz, VBW=300kHz.
3) Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

8.3 TEST SETUP

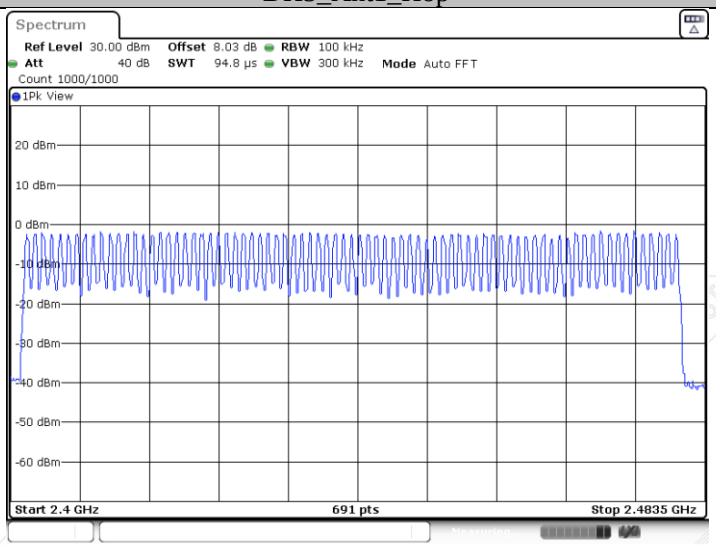


8.4 TEST RESULTS

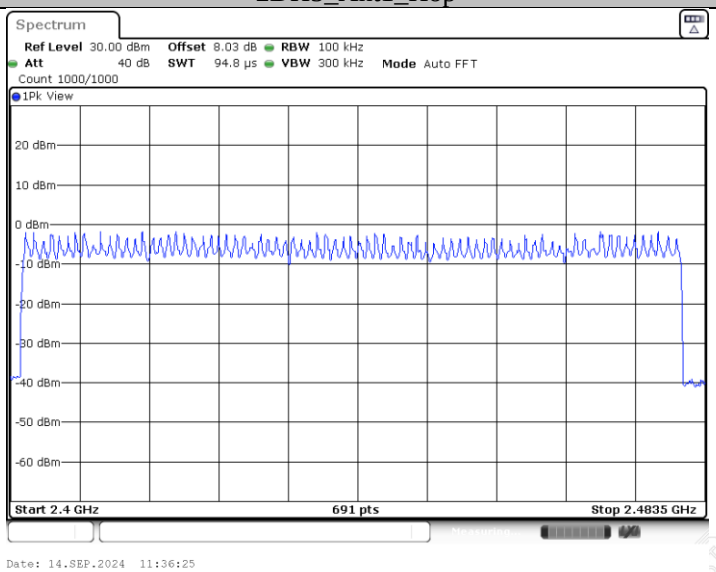
Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-14

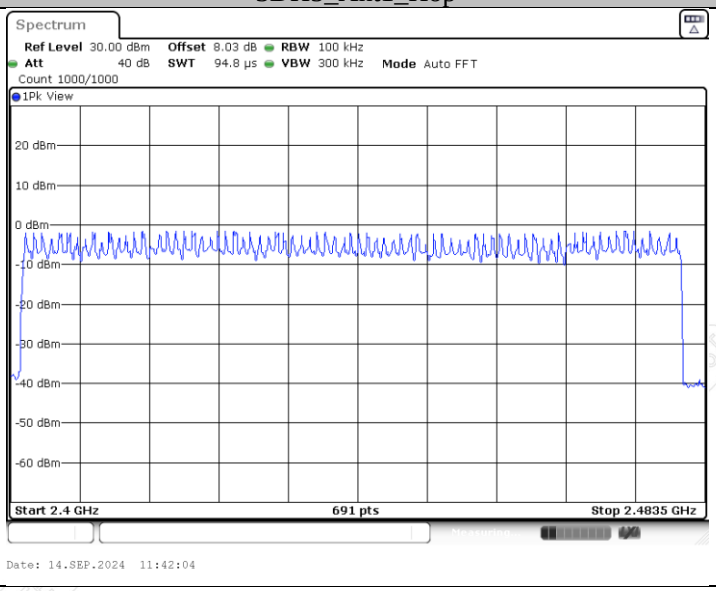
Test mode	Result (No. of CH)	Limit (No. of CH)	Result
DH5	79	≥15	PASS
2DH5	79	≥15	PASS
3DH5	79	≥15	PASS

DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


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9. DWELL TIME

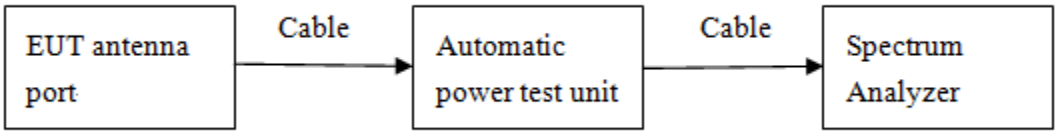
9.1 LIMITS

Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

9.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2) Set spectrum analyzer span = 0. centered on a hopping channel;
3) Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4) Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). Repeat this test for each variation.
5) DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds
6) DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slotsTX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds
7) DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slotsTX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds

9.3 TEST SETUP



9.4 TEST RESULTS

Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-23

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

GFSK: Middle Channel (2.441GHz)

DH1	time slot=	0.368	(ms)*	(1600/(2*79))	*	31.6	=	118	ms
DH3	time slot=	1.608	(ms)*	(1600/(4*79))	*	31.6	=	257	ms
DH5	time slot=	2.849	(ms)*	(1600/(6*79))	*	31.6	=	304	ms

π/4-DQPSK: Middle Channel (2.441GHz)

2DH1	time slot=	0.378	(ms)*	(1600/(2*79))	*	31.6	=	121	ms
2DH3	time slot=	1.621	(ms)*	(1600/(4*79))	*	31.6	=	259	ms
2DH5	time slot=	2.862	(ms)*	(1600/(6*79))	*	31.6	=	305	ms

8DPSK: Middle Channel (2.441GHz)

3DH1	time slot=	0.376	(ms)*	(1600/(2*79))	*	31.6	=	120	ms
3DH3	time slot=	1.620	(ms)*	(1600/(4*79))	*	31.6	=	259	ms
3DH5	time slot=	2.863	(ms)*	(1600/(6*79))	*	31.6	=	305	ms

The results are not greater than 0.4 seconds.

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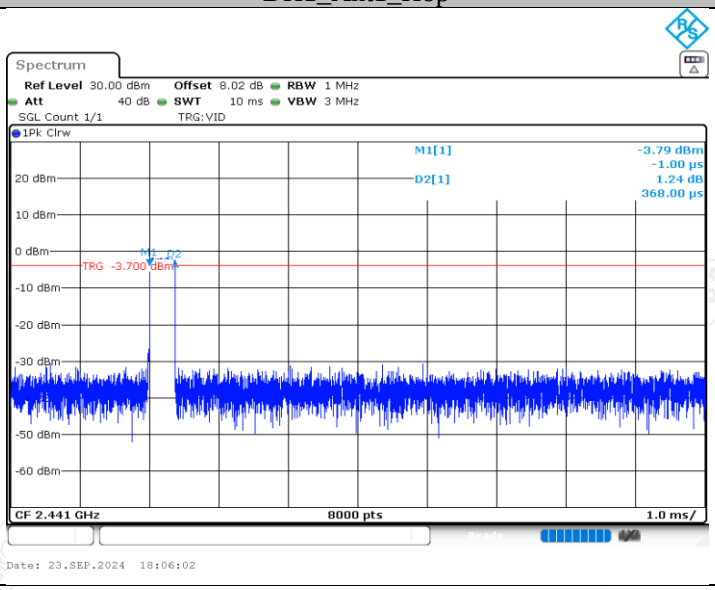
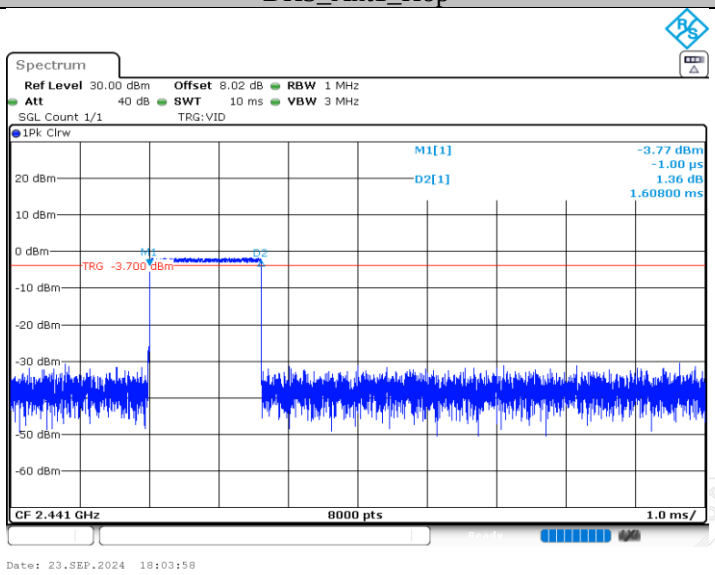
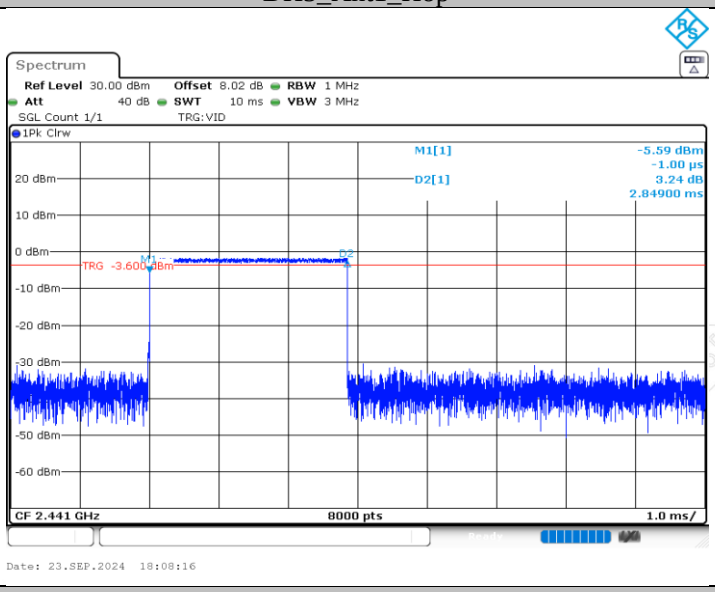
Please refer the graph as below:

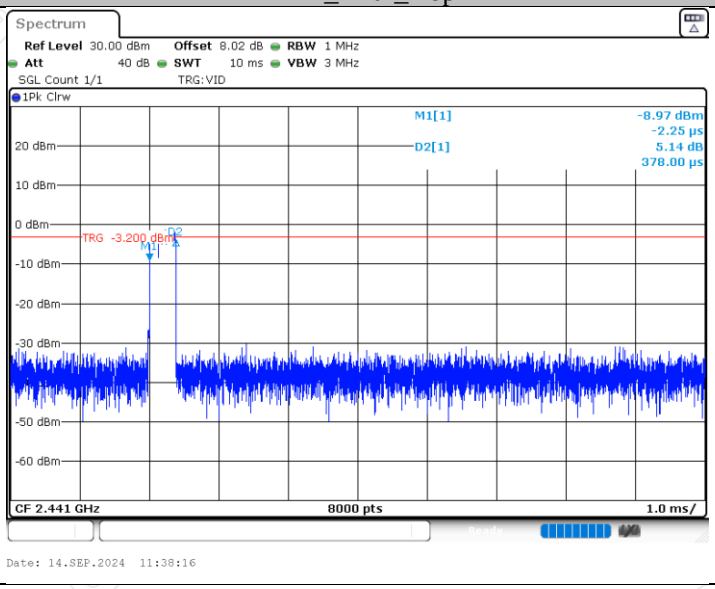
DH1_Ant1_Hop


DH3_Ant1_Hop


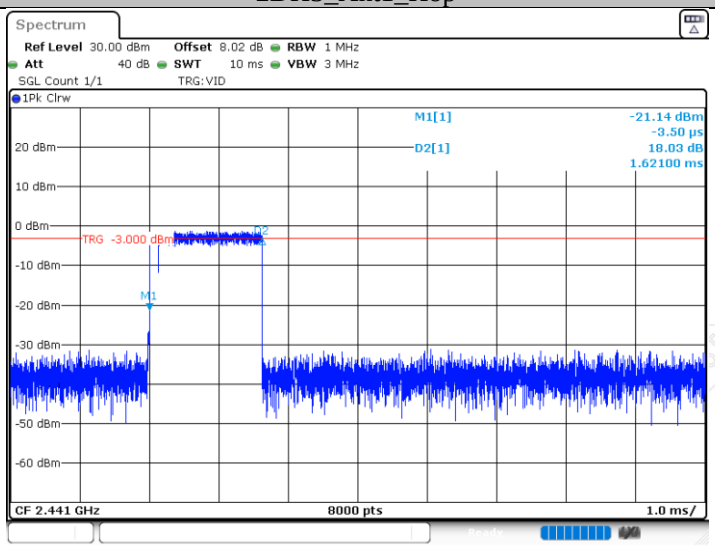
DH5_Ant1_Hop



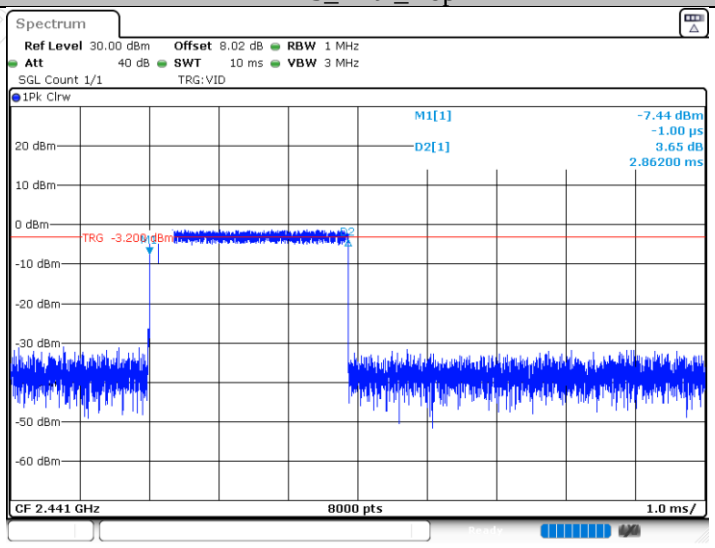
2DH1_Ant1_Hop

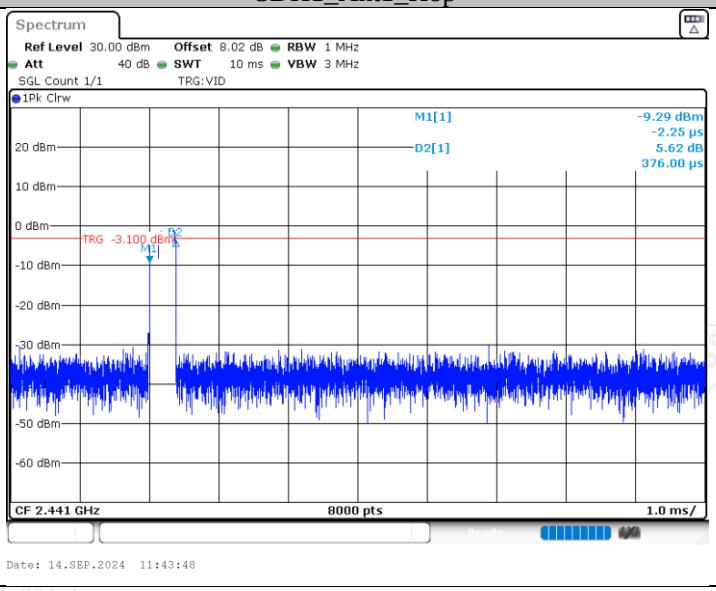


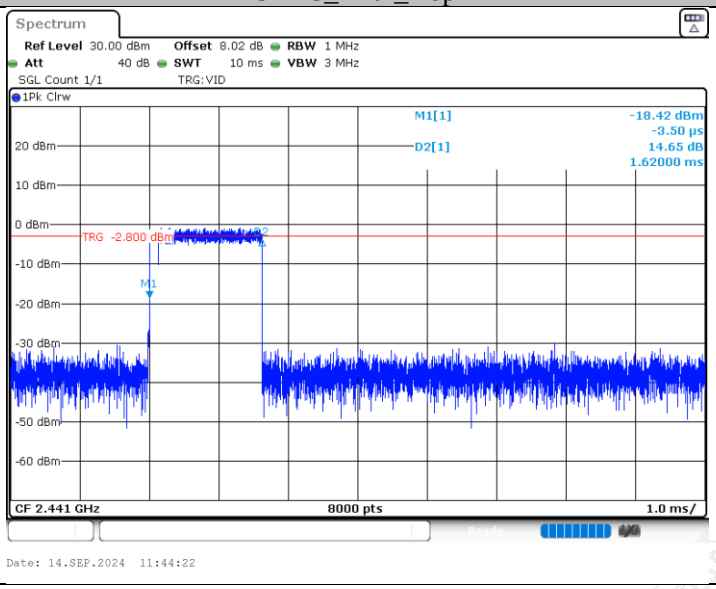
2DH3_Ant1_Hop

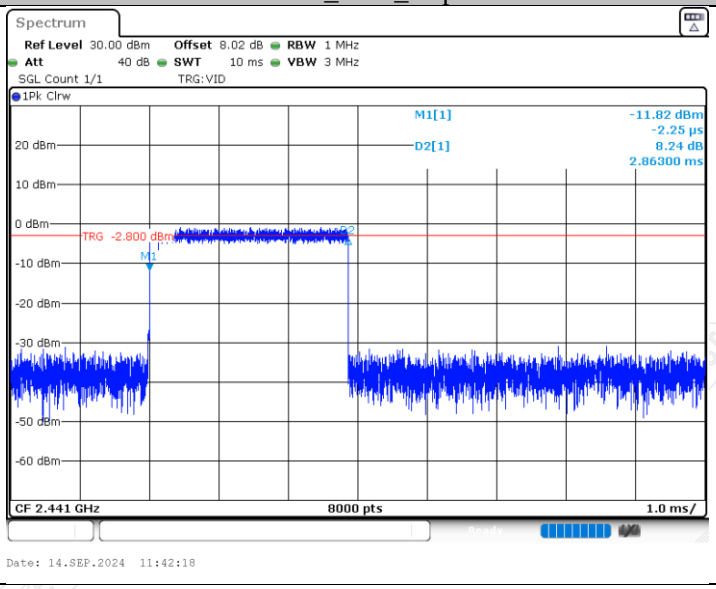


2DH5_Ant1_Hop



3DH1_Ant1_Hop


3DH3_Ant1_Hop


3DH5_Ant1_Hop


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10. MAXIMUM PEAK OUTPUT POWER

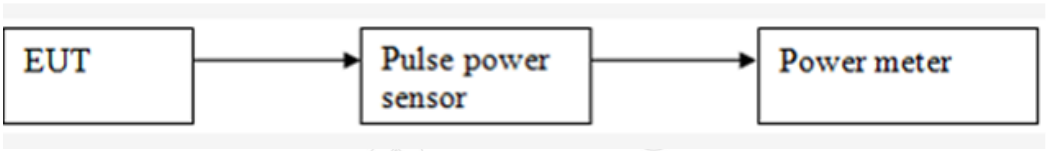
10.1 LIMITS

Regulation 15.247 (b)(1)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.

10.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the power meter and enable the EUT transmit continuously.
2) Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

10.3 TEST SETUP



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10.4 TEST RESULTS

Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-23

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	-2.11	20.97	Peak	Pass
Middle	2.441	-2.37			Pass
Highest	2.480	-2.72			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	-0.52	20.97	Peak	Pass
Middle	2.441	-0.78			Pass
Highest	2.480	-1.14			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	-0.30	20.97	Peak	Pass
Middle	2.441	-0.56			Pass
Highest	2.480	-0.88			Pass

11. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

11.1 LIMITS

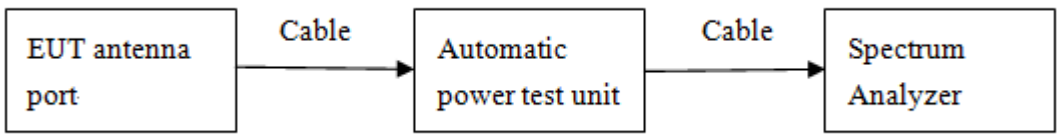
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB.

11.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance v05r02.

1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
3) Measure and record the results in the test report.
4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

11.3 TEST SETUP



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11.4 TEST RESULTS

Environment: 25.3℃/59%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Qin tingting Date: 2024-09-23

Band edge measurements

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Low	2402	-2.86	-49.14	≤-22.86	PASS
		High	2480	-2.75	-47.52	≤-22.75	PASS
		Low	Hop_2402	-3.03	-47.64	≤-23.03	PASS
		High	Hop_2480	-3.54	-47.63	≤-23.54	PASS
2DH5	Ant1	Low	2402	-3.71	-48.39	≤-23.71	PASS
		High	2480	-2.85	-48.19	≤-22.85	PASS
		Low	Hop_2402	-2.93	-47.13	≤-22.93	PASS
		High	Hop_2480	-4.25	-47.4	≤-24.25	PASS
3DH5	Ant1	Low	2402	-2.92	-48.2	≤-22.92	PASS
		High	2480	-2.76	-47.6	≤-22.76	PASS
		Low	Hop_2402	-5.22	-47.4	≤-25.22	PASS
		High	Hop_2480	-3.31	-48.8	≤-23.31	PASS

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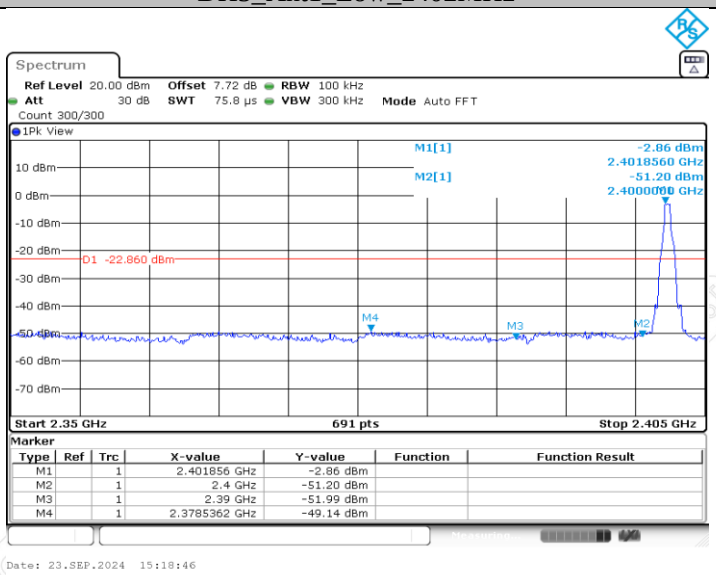
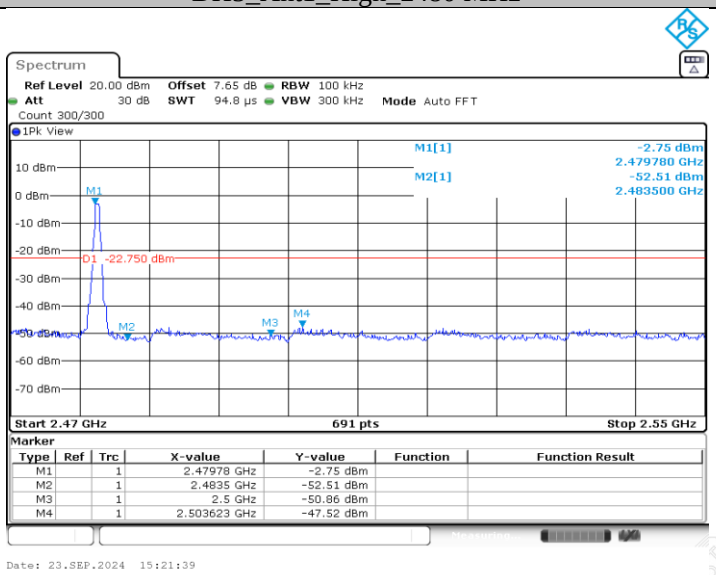
Test result plot as follows:

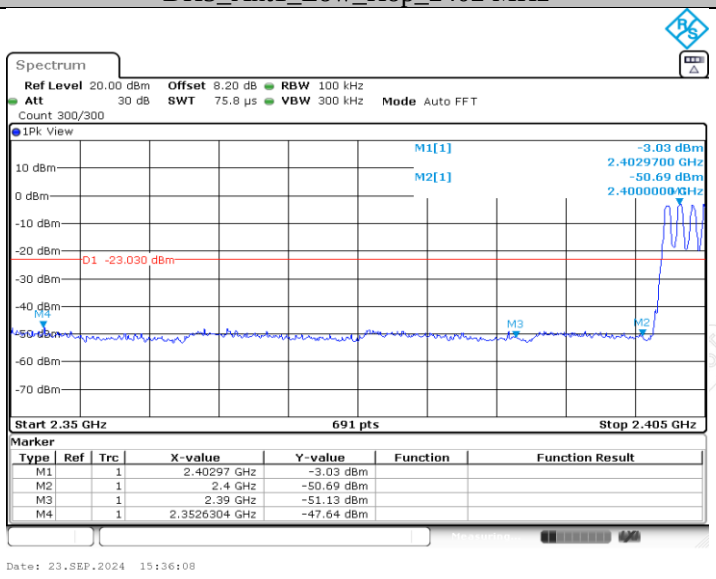
DH5_Ant1_Low_2402MHz



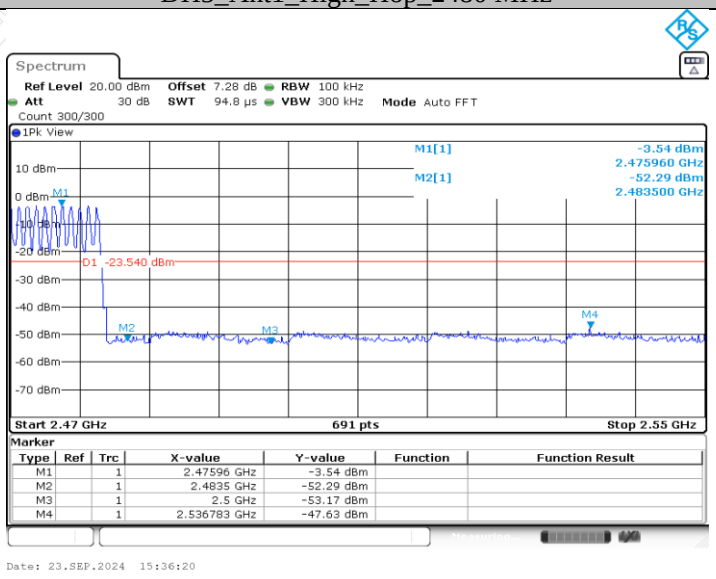
DH5_Ant1_High_2480 MHz

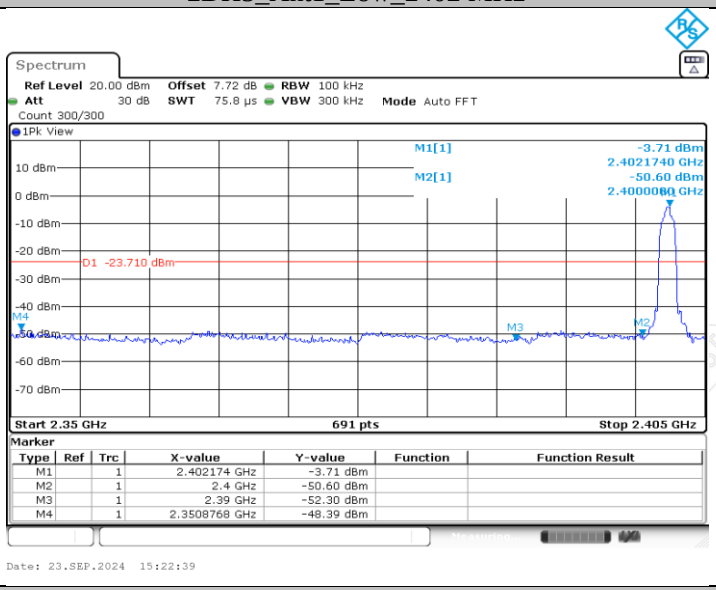


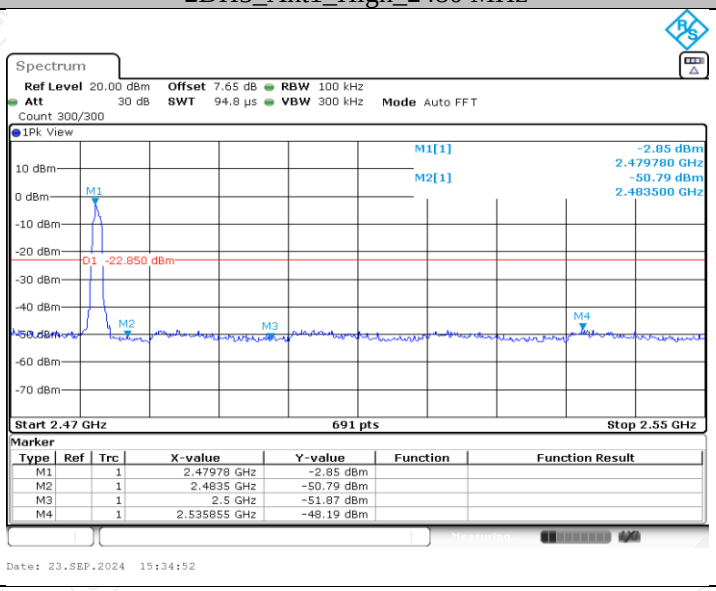
DH5_Ant1_Low_Hop_2402 MHz



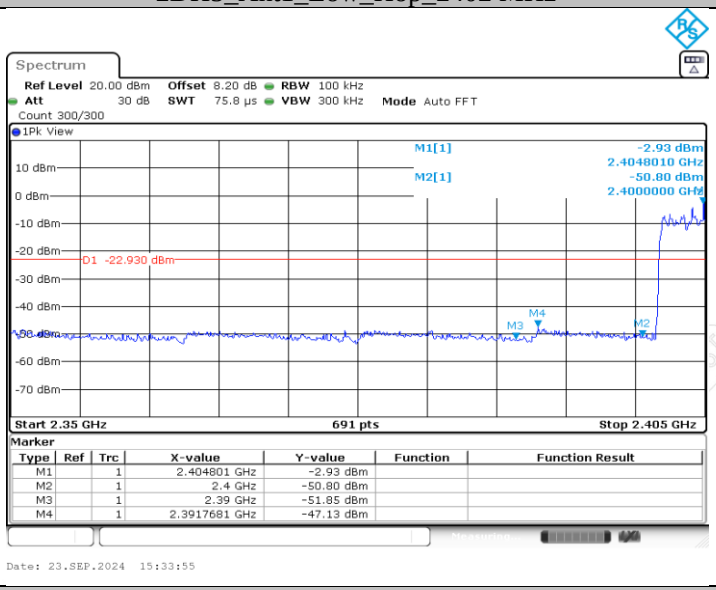
DH5_Ant1_High_Hop_2480 MHz



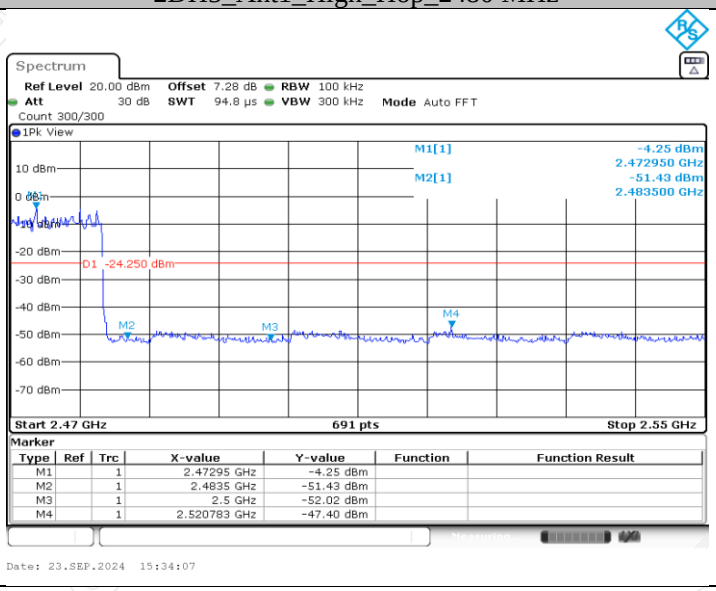
2DH5_Ant1_Low_2402 MHz


2DH5_Ant1_High_2480 MHz


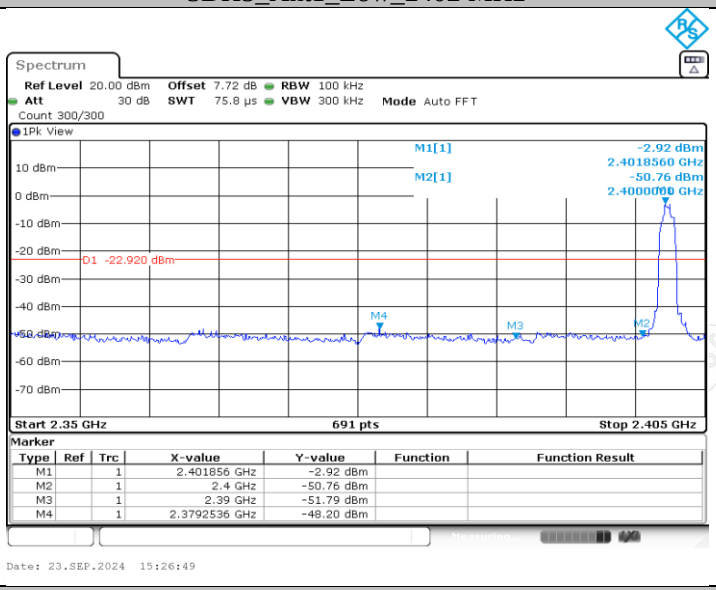
2DH5_Ant1_Low_Hop_2402 MHz



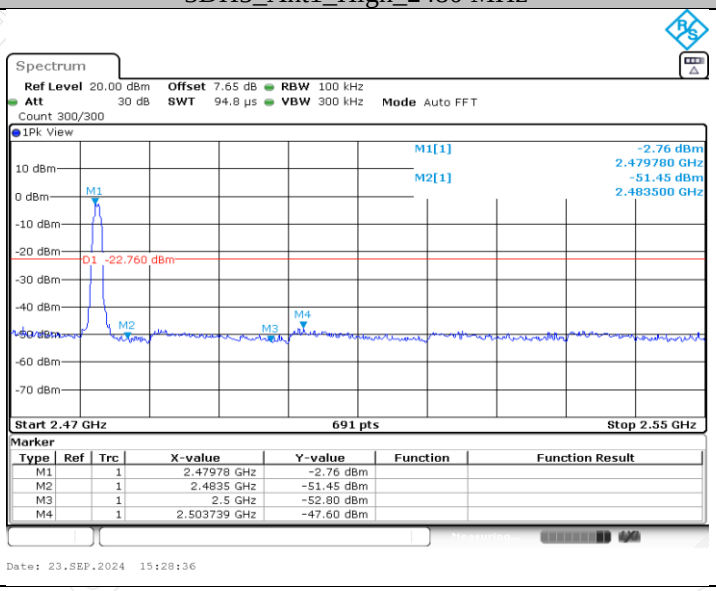
2DH5_Ant1_High_Hop_2480 MHz



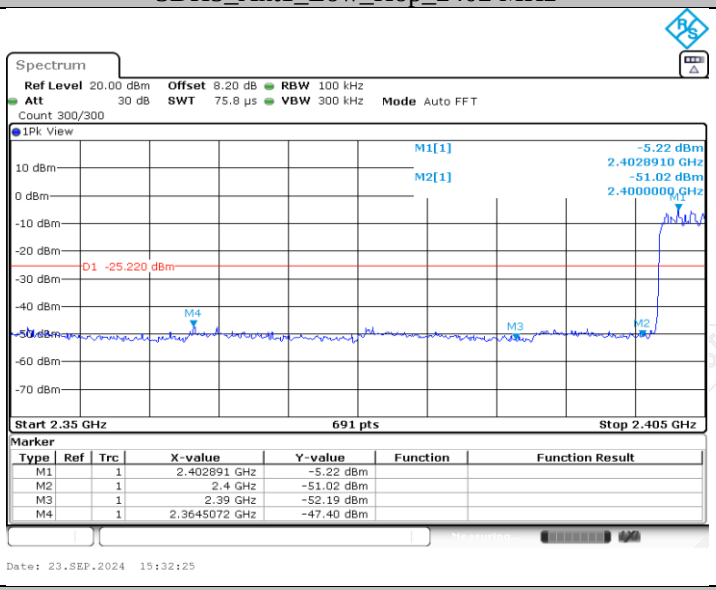
3DH5_Ant1_Low_2402 MHz



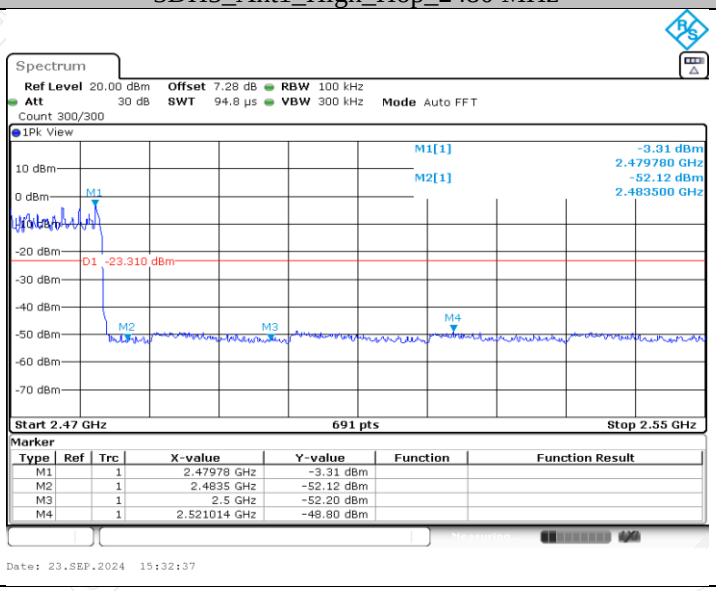
3DH5_Ant1_High_2480 MHz



3DH5_Ant1_Low_Hop_2402 MHz

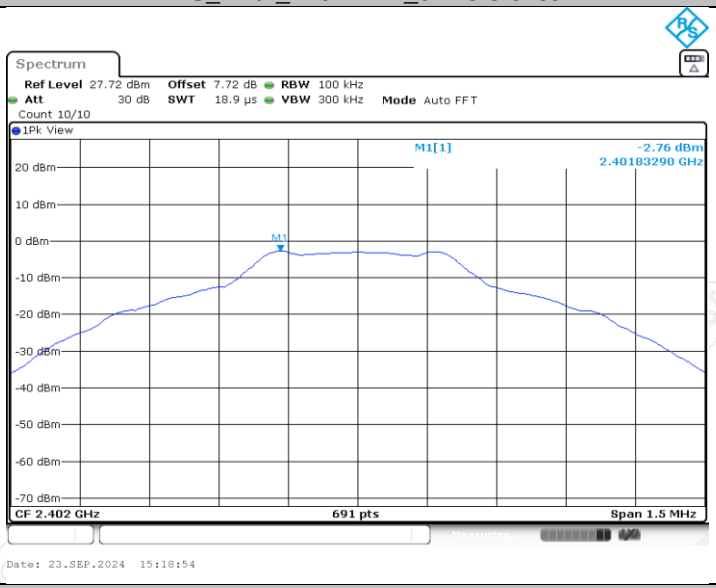
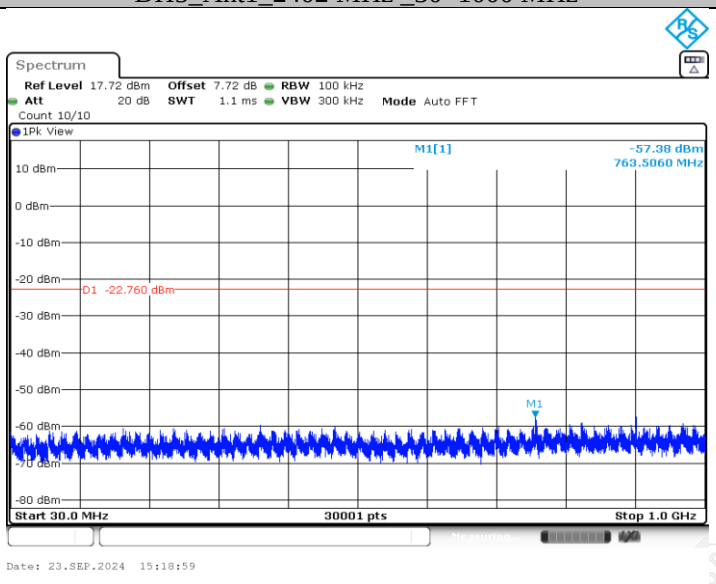


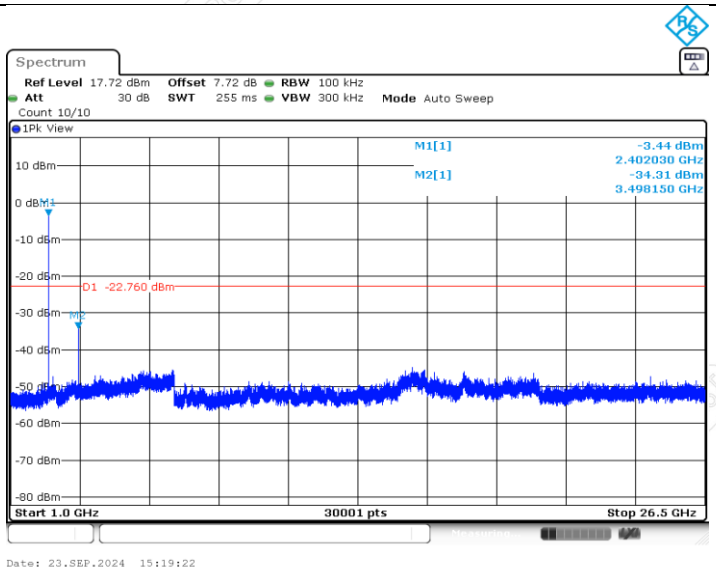
3DH5_Ant1_High_Hop_2480 MHz



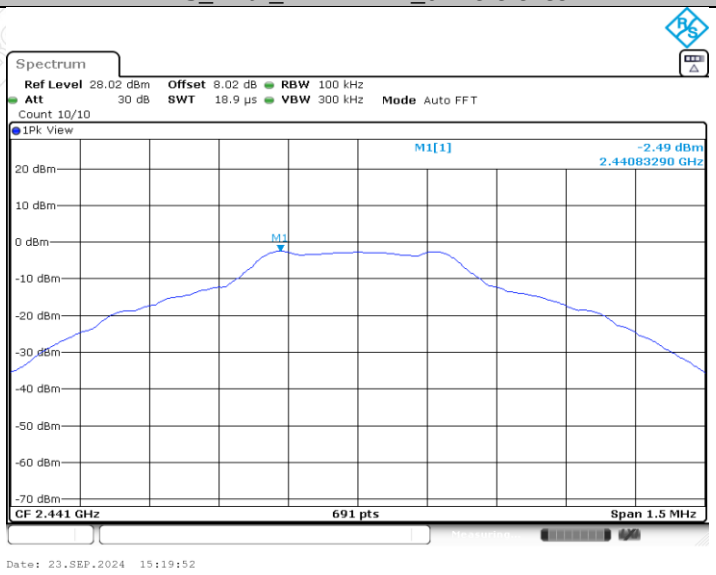
Conducted Spurious Emission

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	Reference	-2.76	-2.76	---	PASS
			30~1000	-2.76	-57.38	≤-22.76	PASS
			1000~26500	-2.76	-34.31	≤-22.76	PASS
		2441	Reference	-2.49	-2.49	---	PASS
			30~1000	-2.49	-54.14	≤-22.49	PASS
			1000~26500	-2.49	-32.39	≤-22.49	PASS
		2480	Reference	-2.77	-2.77	---	PASS
			30~1000	-2.77	-57.37	≤-22.77	PASS
			1000~26500	-2.77	-36.45	≤-22.77	PASS
2DH5	Ant1	2402	Reference	-2.96	-2.96	---	PASS
			30~1000	-2.96	-57.01	≤-22.96	PASS
			1000~26500	-2.96	-44.92	≤-22.96	PASS
		2441	Reference	-2.67	-2.67	---	PASS
			30~1000	-2.67	-55.17	≤-22.67	PASS
			1000~26500	-2.67	-44.52	≤-22.67	PASS
		2480	Reference	-2.88	-2.88	---	PASS
			30~1000	-2.88	-59.13	≤-22.88	PASS
			1000~26500	-2.88	-43.73	≤-22.88	PASS
3DH5	Ant1	2402	Reference	-2.83	-2.83	---	PASS
			30~1000	-2.83	-55.48	≤-22.83	PASS
			1000~26500	-2.83	-44.39	≤-22.83	PASS
		2441	Reference	-2.54	-2.54	---	PASS
			30~1000	-2.54	-57.16	≤-22.54	PASS
			1000~26500	-2.54	-44.52	≤-22.54	PASS
		2480	Reference	-2.79	-2.79	---	PASS
			30~1000	-2.79	-57.33	≤-22.79	PASS
			1000~26500	-2.79	-44.26	≤-22.79	PASS

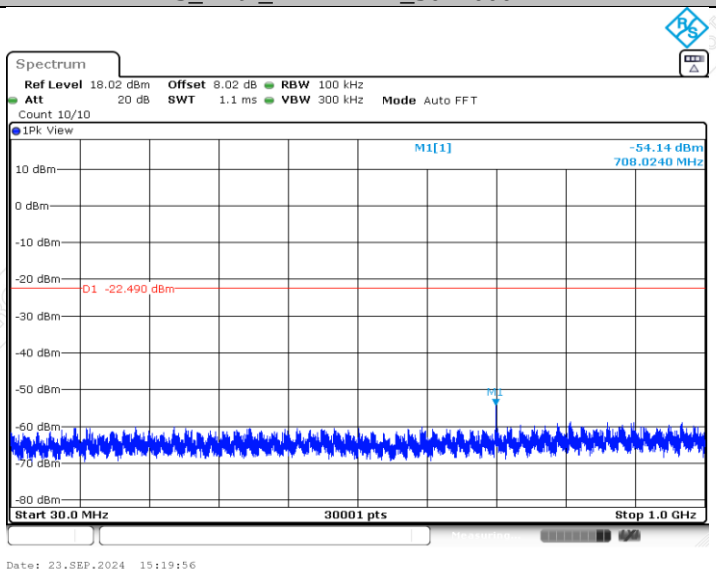
DH5_Ant1_2402MHz_0~Reference

DH5_Ant1_2402 MHz _30~1000 MHz

DH5_Ant1_2402 MHz _1000~26500 MHz



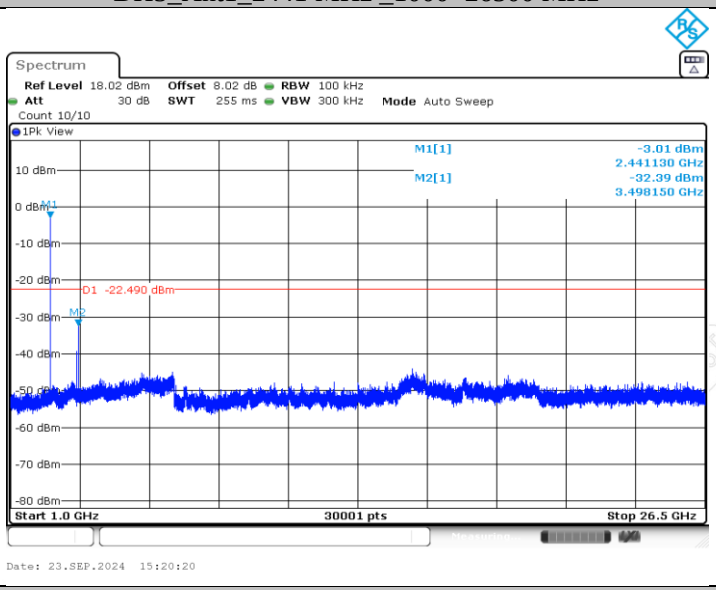
DH5_Ant1_2441 MHz _0~Reference



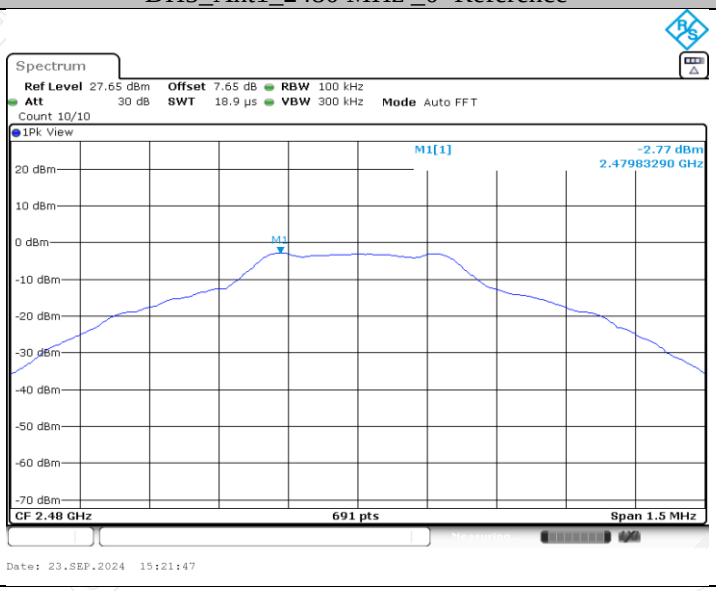
DH5_Ant1_2441 MHz _30~1000 MHz

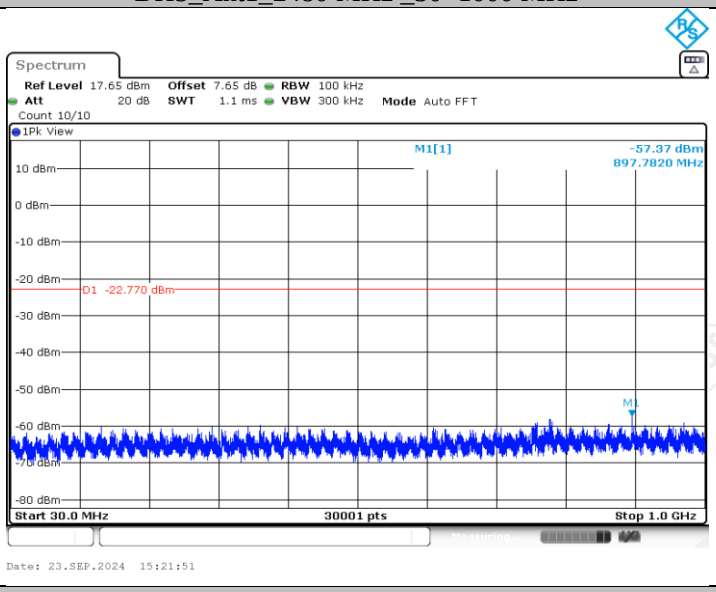


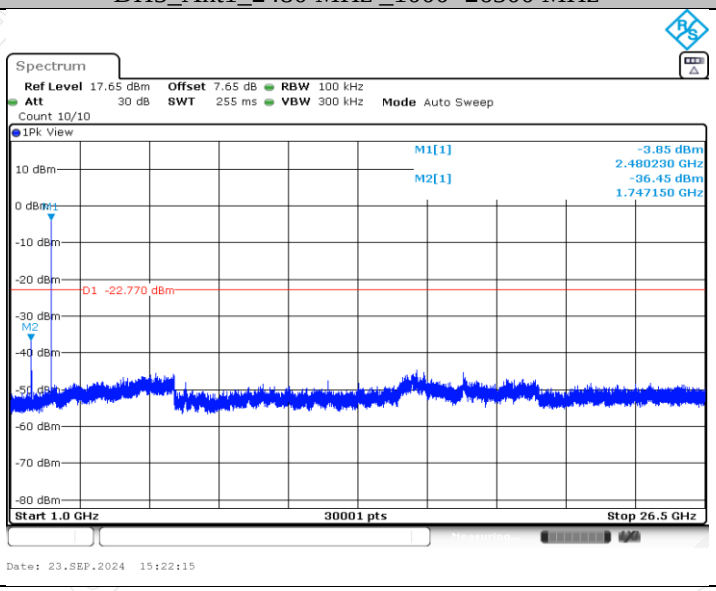
DH5_Ant1_2441 MHz _1000~26500 MHz



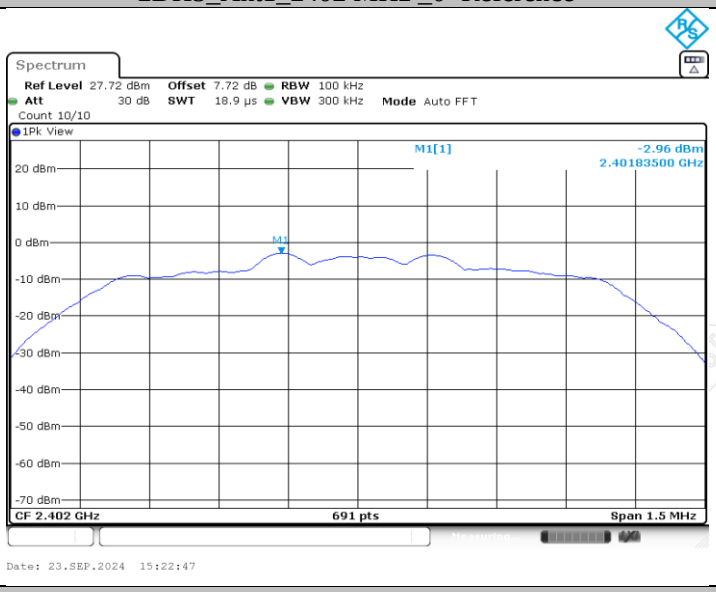
DH5_Ant1_2480 MHz _0~Reference



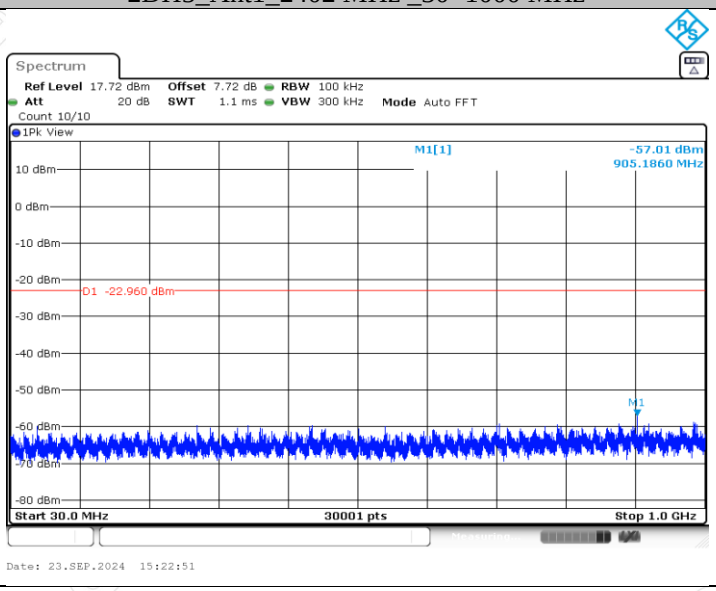
DH5_Ant1_2480 MHz _30~1000 MHz


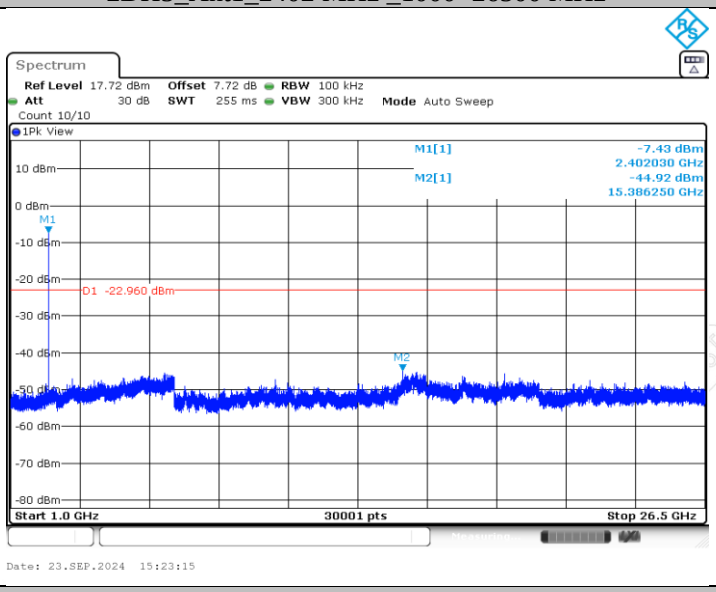
DH5_Ant1_2480 MHz _1000~26500 MHz


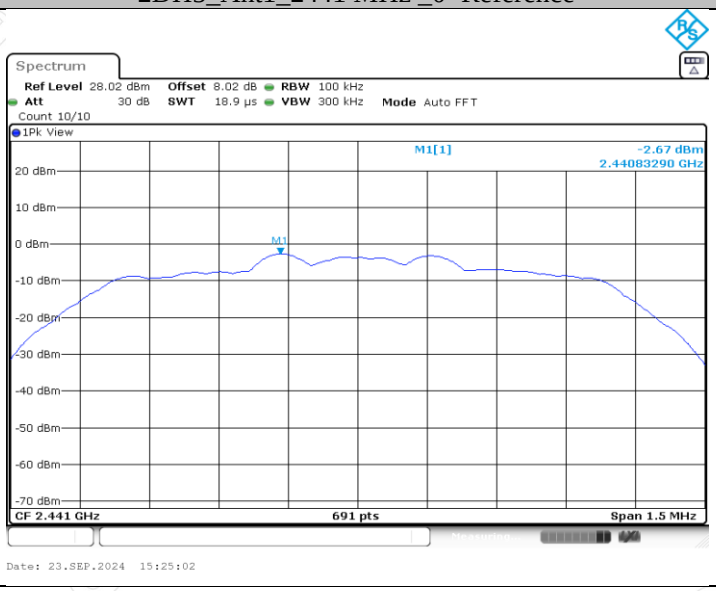
2DH5_Ant1_2402 MHz _0~Reference

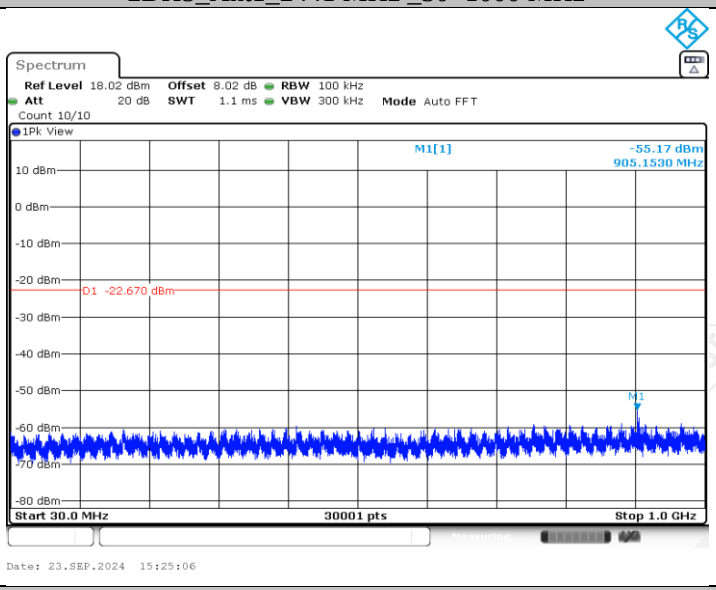


2DH5_Ant1_2402 MHz _30~1000 MHz



2DH5_Ant1_2402 MHz _1000~26500 MHz


2DH5_Ant1_2441 MHz _0~Reference


2DH5_Ant1_2441 MHz _30~1000 MHz


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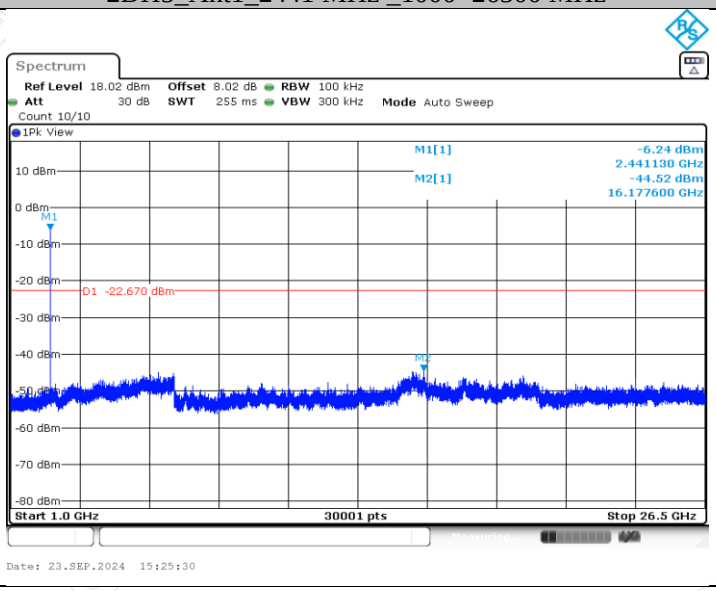

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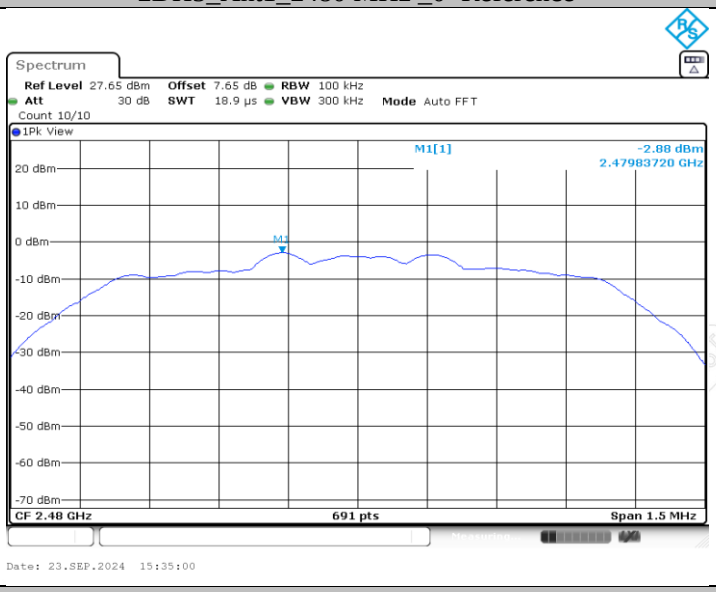
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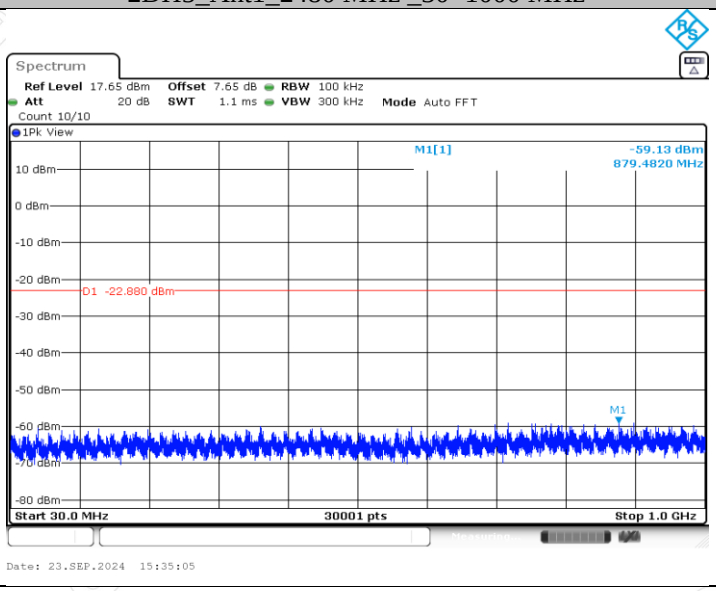

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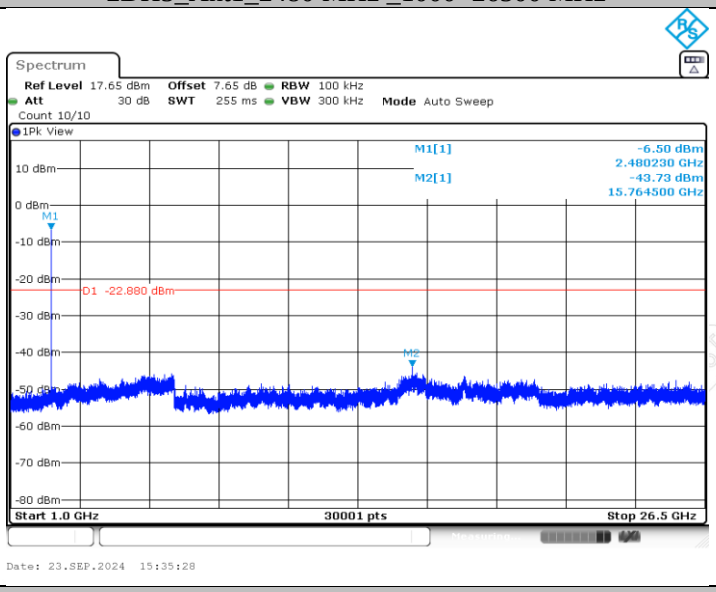

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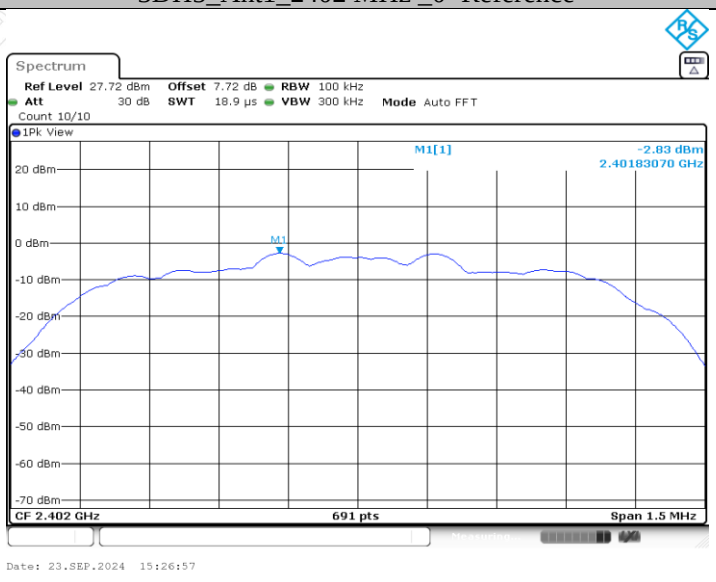
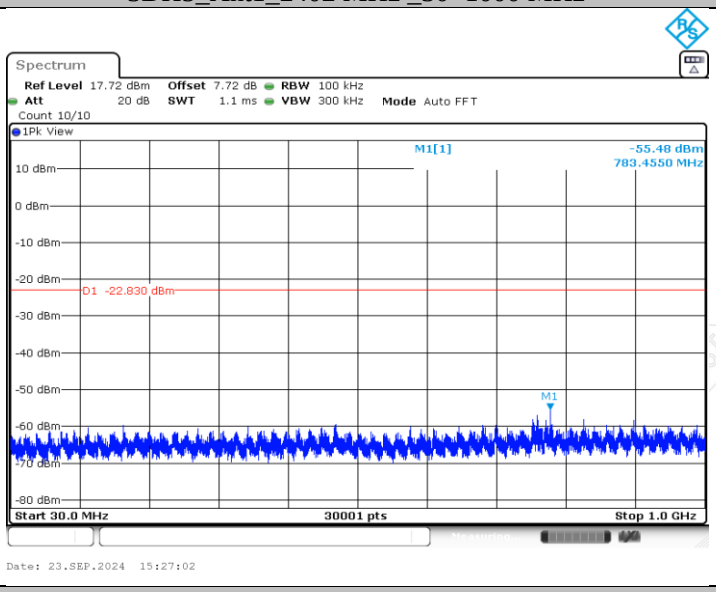
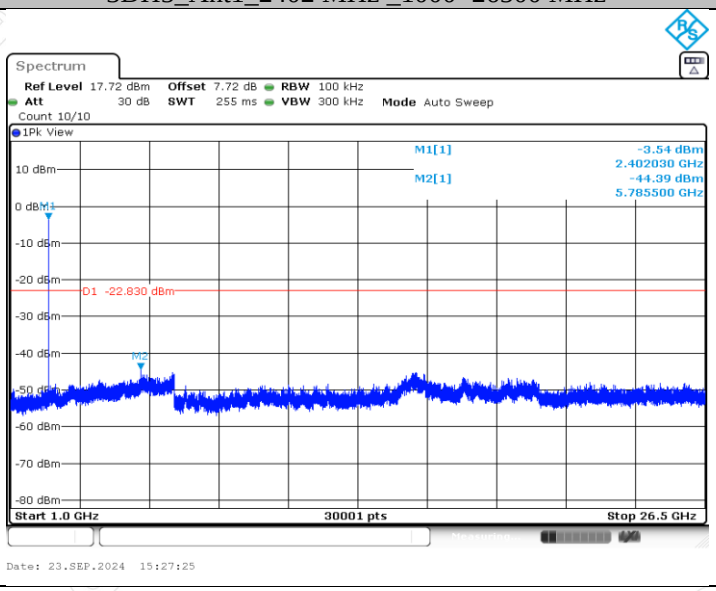


3DH5_Ant1_2402 MHz _30~1000 MHz


3DH5_Ant1_2402 MHz _1000~26500 MHz


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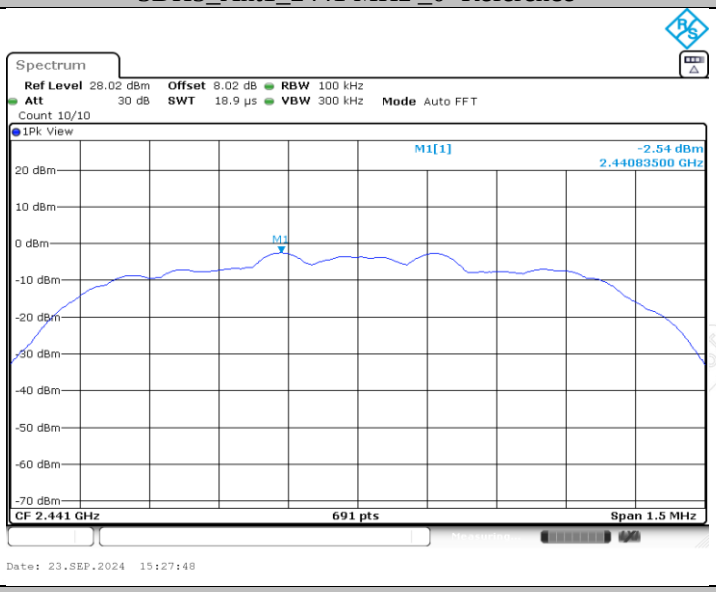
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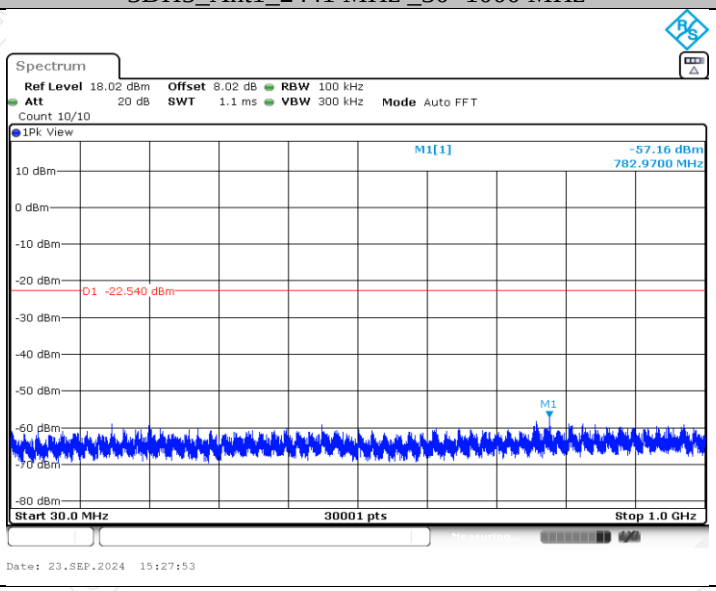
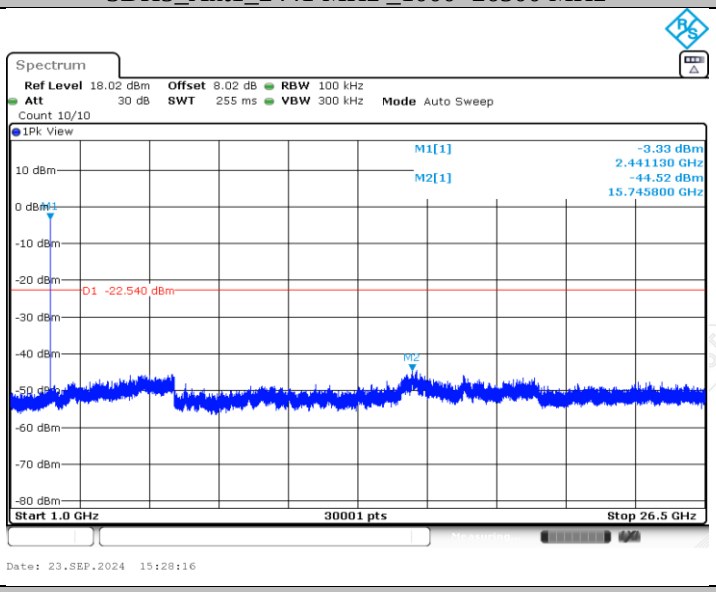
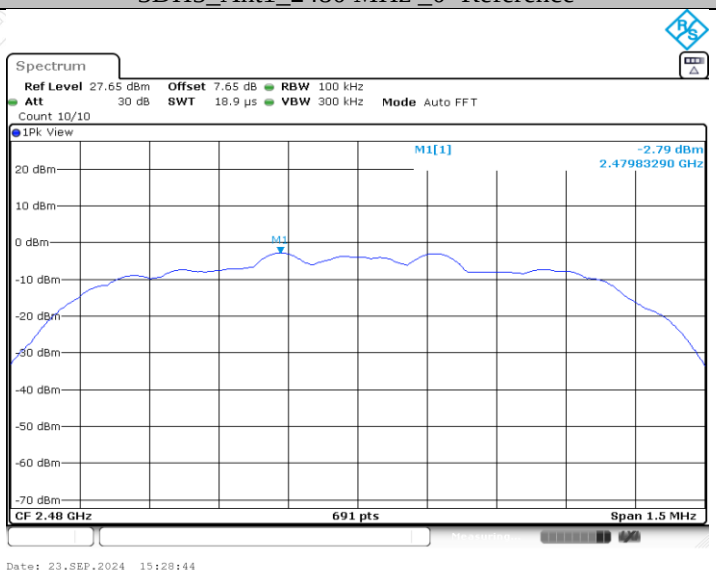
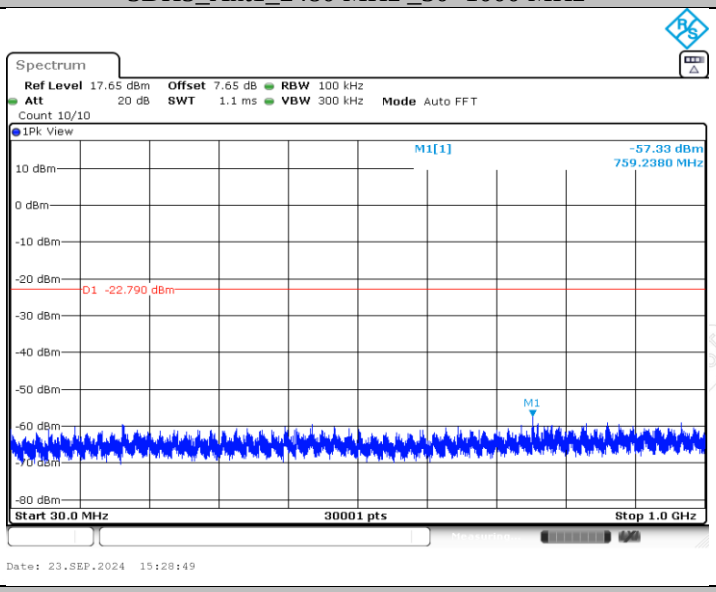


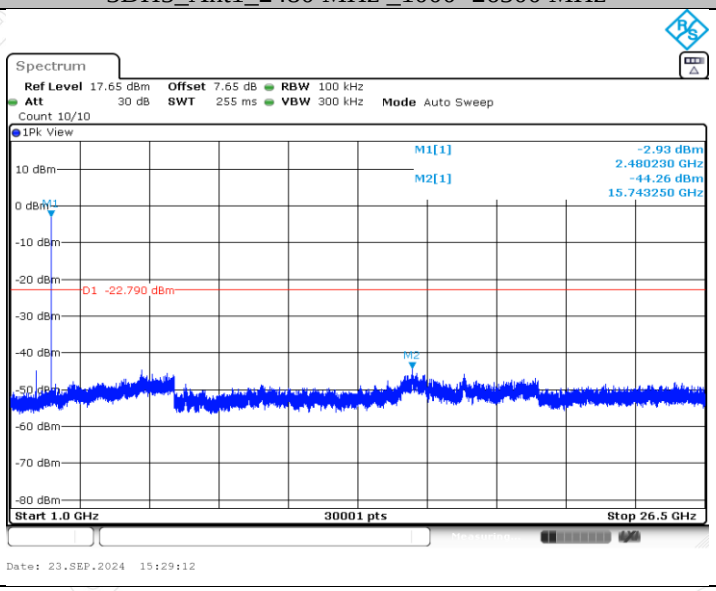
3DH5_Ant1_2441 MHz _1000~26500 MHz


3DH5_Ant1_2480 MHz _0~Reference


3DH5_Ant1_2480 MHz _30~1000 MHz



3DH5_Ant1_2480 MHz _1000~26500 MHz



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12. RADIATED SPURIOUS EMISSIONS

12.1 LIMITS

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

(1) The emission limits for the ranges 9-90kHz and 110-490kHz are based on measurements employing a linear average detector.

(2) The lower limit shall apply at the transition frequencies.

(3) Above 18GHz test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m). The Avg Limit=54+20*log(3/1)=63.54 (dBμV/m).

12.2 TEST PROCEDURES

1) Sequence of testing 9kHz to 30MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna height is 1.0 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30MHz to 1GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1GHz to 18GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18GHz
Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:

(a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak&AVG), RBW=300Hz(for Peak&AVG). the frequency from 150kHz to 30MHz, Set RBW=9kHz, RBW=9kHz, (for QP Detector).
(b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, RBW=300kHz, (for QP Detector).
(c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.
(d).The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle ≥98%， set VBW≤RBW/100 (i.e.,10kHz) but not less than 10 Hz. if the EUT duty cycle is ＜98%，set VBW≥1/T, Where T is defined in section 2.7.

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12.3 TEST SETUP

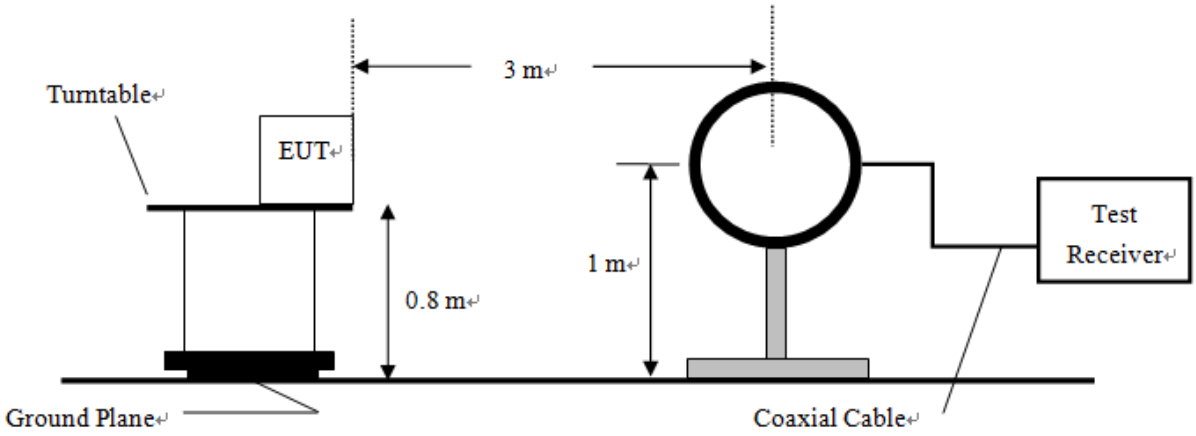

Figure 1. 9kHz to 30MHz radiated emissions test configuration

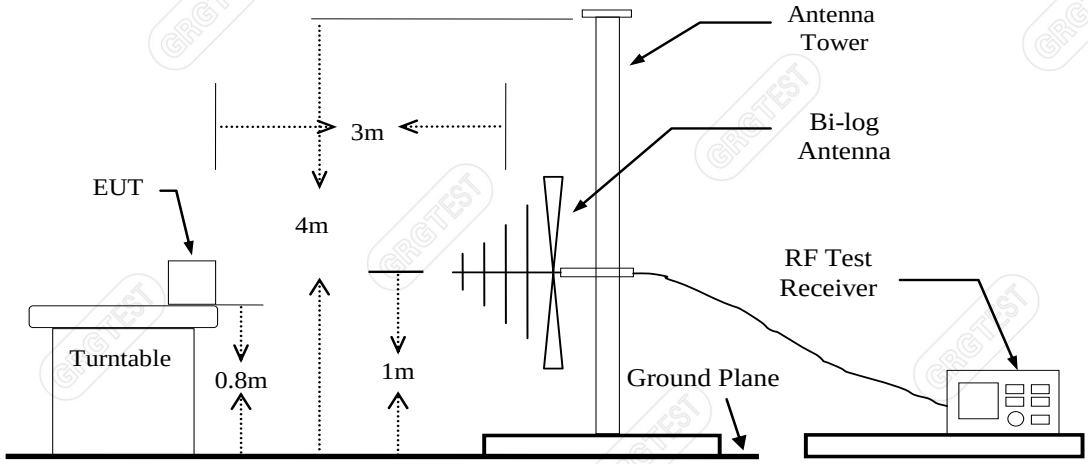

Figure 2. 30MHz to 1GHz radiated emissions test configuration

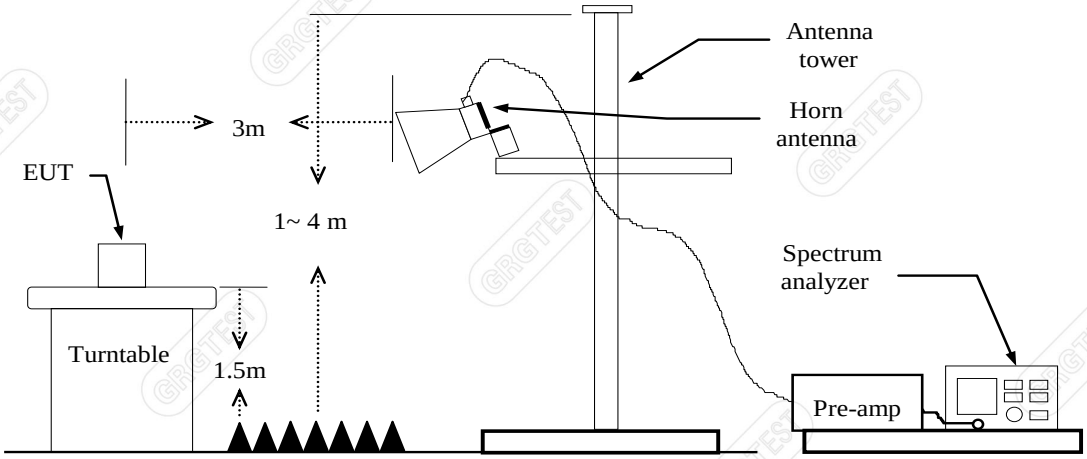

Figure 3. 1GH to 18GHz radiated emissions test configuration

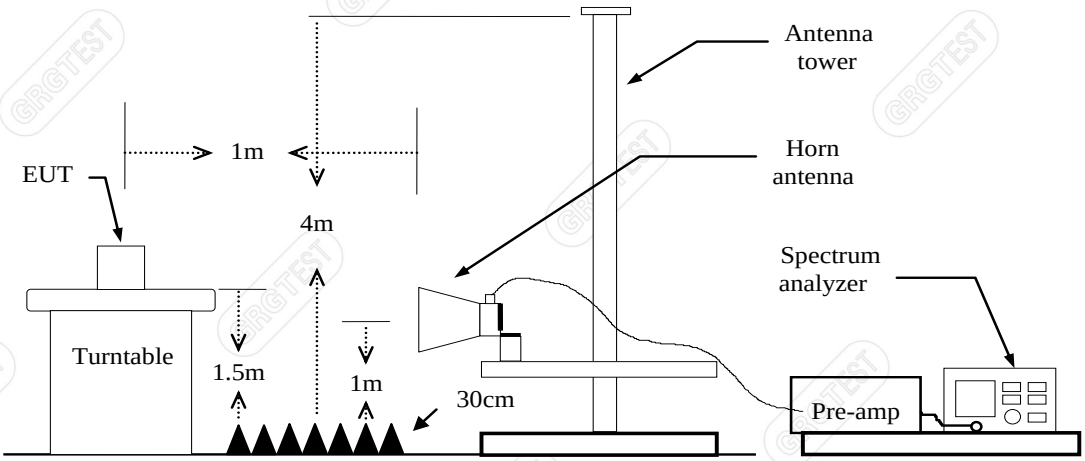

Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

12.4 DATA SAMPLE

30MHz to 1GHz

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
xxx	86.5096	67.55	33.83	-33.72	40.00	6.17	QP	200	118	Horizontal	PASS

Frequency (MHz) = Emission frequency in MHz

Reading (dBuV) = Uncorrected Analyzer / Receiver reading

Factor (dB) = Antenna factor + Cable loss – Amplifier gain

Level (dBuV/m) = Reading (dBuV) + Factor (dB)

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Limit (dBuV/m) - Level (dBuV/m)

QP = Quasi-peak Reading

1GHz-18GHz

No.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	78.01	55.30	-22.71	74.00	18.70	100	50	Horizontal	Peak
xxx	xxxx	66.37	43.66	-22.71	54.00	10.34	100	50	Horizontal	AVG

Above 18GHz

NO.	Freq. [MHz]	Reading [dBμV/m]	Level for 1m [dBμV/m]	Level for 3m [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	54.49	42.38	32.84	-12.11	74	41.16	100	211	Horizontal	Peak
xxx	xxxx	43.99	31.88	22.34	-12.11	54	31.66	100	211	Horizontal	AVG

Frequency (MHz) = Emission frequency in MHz

Reading (dBuV/m) = Uncorrected Analyzer / Receiver reading

Factor (dB)	= Antenna factor + Cable loss – Amplifier gain
Level for 1m (dBuV/m)	= Reading (dBuV/m) + Factor (dB)
Level for 3m (dBuV/m)	= Level for 1m (dBuV/m) + 20*log(1/3)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Limit (dBuV/m) – Level (dBuV/m)
Polarity	= Antenna polarization
Peak	= Peak Reading
AVG	= Average Reading

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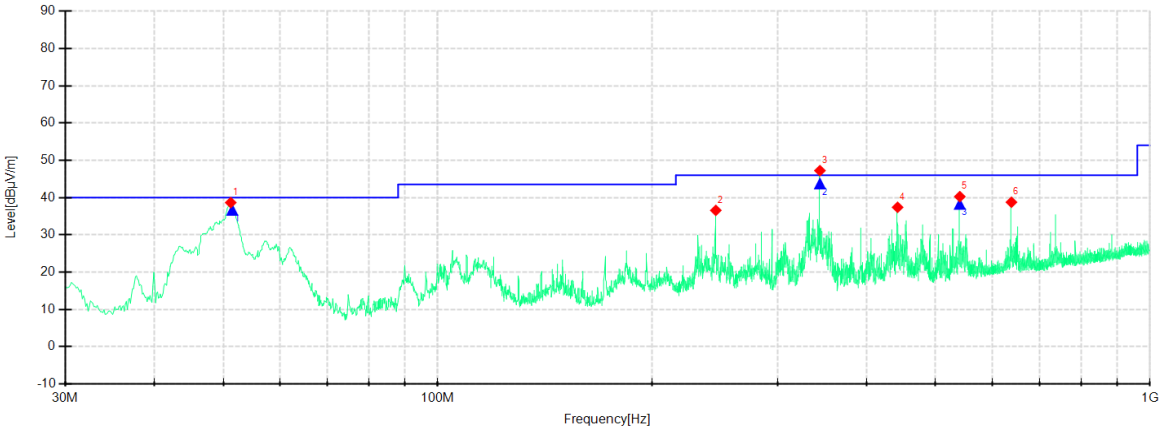
12.5 TEST RESULTS

Below 1GHz:

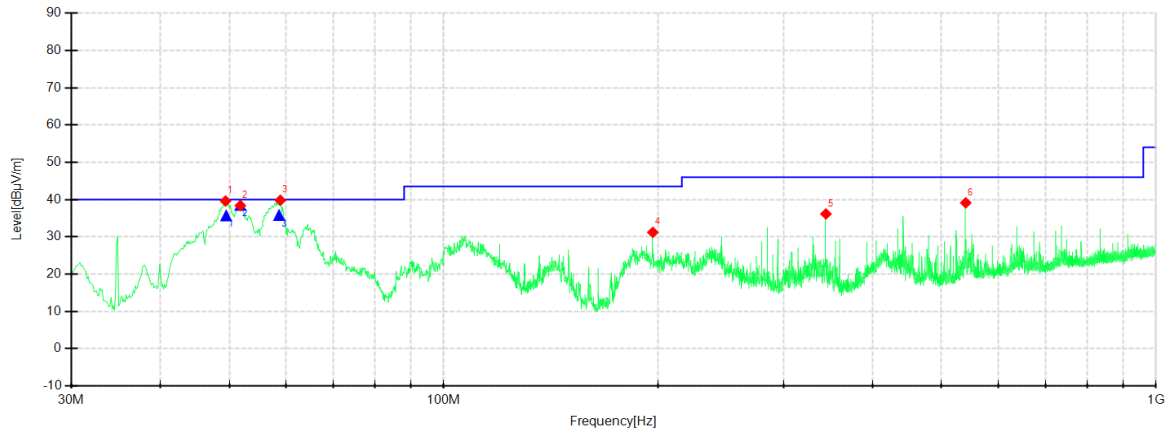
All models were pretested and only the worst modes and channels were recorded in this report (3DH5_2402MHz).

Product	Donner OURA Piano	Model No.	R300
Power supply:	AC 120V/60Hz	Environmental Conditions:	25.5℃/53%RH/101.0kPa
Test Engineer:	Wen wenwen	Test Date:	2024-10-27
Sample No:	E20240827121501-0002	/	/



NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	51.2214	67.56	38.64	-28.92	40.00	1.36	PK	200	339	Horizontal	PASS
2	245.7307	66.03	36.56	-29.47	46.00	9.44	PK	100	360	Horizontal	PASS
3	344.0768	73.26	47.22	-26.04	46.00	-1.22	PK	100	357	Horizontal	/
4	442.3015	60.02	37.38	-22.64	46.00	8.62	PK	100	101	Horizontal	PASS
5	540.7688	60.85	40.25	-20.60	46.00	5.75	PK	100	344	Horizontal	PASS
6	638.9936	57.67	38.74	-18.93	46.00	7.26	PK	200	0	Horizontal	PASS

Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV/m]	Level [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	51.4764	-28.92	65.55	36.63	40.00	3.37	200	358.9	Horizontal	PASS
2	344.0618	-26.04	69.71	43.67	46.00	2.33	120	336.1	Horizontal	PASS
3	540.6828	-20.60	58.80	38.20	46.00	7.80	103	338.6	Horizontal	PASS



NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	49.4024	68.46	39.61	-28.85	40.00	0.39	PK	100	178	Vertical	PASS
2	51.8277	67.35	38.39	-28.96	40.00	1.61	PK	200	183	Vertical	PASS
3	58.9824	69.26	39.81	-29.45	40.00	0.19	PK	100	150	Vertical	PASS
4	196.6183	62.49	31.21	-31.28	43.50	12.29	PK	100	206	Vertical	PASS
5	344.0768	62.17	36.13	-26.04	46.00	9.87	PK	100	150	Vertical	PASS
6	540.6476	59.71	39.11	-20.60	46.00	6.89	PK	100	43	Vertical	PASS

Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV/m]	Level [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	49.4989	-28.85	64.49	35.64	40.00	4.36	200	61.8	Vertical	PASS
2	51.8232	-28.96	67.43	38.47	40.00	1.53	200	348.7	Vertical	PASS
3	58.7365	-29.45	65.22	35.77	40.00	4.23	111	40.9	Vertical	PASS

Remark:

1 No emission found between lowest internal used/generated frequency to 30MHz.
2 Pre-scan all mode and recorded the worst case results in this report (TX-Low Channel(3Mbps))
3 Measuring frequencies from 9kHz to the 1GHz.
4 Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.
5 The IF bandwidth of SPA between 30MHz to 1GHz was 120kHz.
6 If the margin of the pre-test results is greater than 6dB, it meets the requirements of quasi peak or average values, and final testing is no longer required.

1GHz to 18GHz:

All models were pretested and only the worst modes were recorded in this report.

Mode: DH5
Lowest Frequency (2402MHz)
Environment:23.1℃/48%RH/101.0kPa Test Voltage:AC 120V/60Hz
Test Engineer: Jiang tao Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1318.4000	48.59	40.51	-8.08	74.00	33.49	200	196	Horizontal
2	2170.0000	50.07	46.08	-3.99	74.00	27.92	200	33	Horizontal
3	2498.2000	47.97	47.77	-0.20	74.00	26.23	100	204	Horizontal
4	5146.5000	48.61	42.63	-5.98	74.00	31.37	200	188	Horizontal
5	8745.0000	41.81	47.93	6.12	74.00	26.07	100	76	Horizontal
6	14703.0000	36.60	51.40	14.80	74.00	22.60	200	356	Horizontal

AV Final Data List								
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Polarity
1	14696.8200	14.71	25.37	40.08	54.00	13.92	100	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1498.4000	47.77	40.43	-7.34	74.00	33.57	100	340	Vertical
2	2501.4000	47.25	46.73	-0.52	74.00	27.27	200	207	Vertical
3	5115.0000	48.52	42.63	-5.89	74.00	31.37	200	64	Vertical
4	7279.5000	44.74	45.93	1.19	74.00	28.07	200	323	Vertical
5	9607.5000	45.62	52.93	7.31	74.00	21.07	100	345	Vertical
6	14713.5000	35.67	53.41	17.74	74.00	20.59	100	85	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9608.0525	7.31	43.32	50.63	54.00	3.37	100	337.2	Vertical
2	14713.5000	17.74	25.67	43.41	54.00	10.59	100	85	Vertical

Mode: DH5
Middle Frequency (2441MHz)
Environment:23.1℃/48%RH/101.0kPa
Test Engineer: Jiang tao

Test Voltage:AC 120V/60Hz
Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1884.8000	48.95	44.45	-4.50	74.00	29.55	200	98	Horizontal
2	2210.4000	50.97	47.54	-3.43	74.00	26.46	100	247	Horizontal
3	2960.0000	47.64	46.88	-0.76	74.00	27.12	100	58	Horizontal
4	4444.5000	50.02	41.39	-8.63	74.00	32.61	100	245	Horizontal
5	8748.0000	41.12	47.24	6.12	74.00	26.76	200	202	Horizontal
6	13107.0000	35.23	51.25	16.02	74.00	22.75	200	268	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	13107.0100	15.97	26.53	42.55	54.00	11.45	200	98	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1464.0000	48.79	41.28	-7.51	74.00	32.72	200	136	Vertical
2	2118.6000	48.69	43.84	-4.85	74.00	30.16	100	314	Vertical
3	5107.5000	49.25	43.33	-5.92	74.00	30.67	200	87	Vertical
4	6501.0000	46.15	45.33	-0.82	74.00	28.67	100	102	Vertical
5	9763.5000	46.16	54.98	8.82	74.00	19.02	100	168	Vertical
6	14695.5000	36.57	54.54	17.97	74.00	19.46	100	182	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9764.0625	8.82	41.62	50.44	54.00	3.56	100	193.7	Vertical
2	14695.5000	17.97	25.45	43.42	54.00	10.58	100	182	Vertical

Mode: DH5
Highest Frequency (2480MHz)
Environment:23.1℃/48%RH/101.0kPa
Test Engineer: Jiang tao

Test Voltage:AC 120V/60Hz
Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1380.2000	48.23	40.36	-7.87	74.00	33.64	100	192	Horizontal
2	2248.2000	50.76	47.22	-3.54	74.00	26.78	100	219	Horizontal
3	5041.5000	49.20	43.05	-6.15	74.00	30.95	100	19	Horizontal
4	6717.0000	46.47	45.75	-0.72	74.00	28.25	100	188	Horizontal
5	8749.5000	41.76	47.87	6.11	74.00	26.13	200	340	Horizontal
6	13093.5000	35.48	51.42	15.94	74.00	22.58	100	279	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	13093.5000	15.94	26.55	42.49	54.00	11.51	100	279	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1209.0000	49.18	40.27	-8.91	74.00	33.73	100	235	Vertical
2	1908.2000	48.00	43.35	-4.65	74.00	30.65	100	340	Vertical
3	5035.5000	48.69	42.51	-6.18	74.00	31.49	100	86	Vertical
4	6535.5000	46.25	45.25	-1.00	74.00	28.75	100	178	Vertical
5	7935.0000	42.73	46.15	3.42	74.00	27.85	100	19	Vertical
6	9919.5000	45.91	54.23	8.32	74.00	19.77	100	165	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9920.0725	8.32	42.23	50.55	54.00	3.45	100	171.3	Vertical

Mode: 3DH5
Lowest Frequency (2402MHz)
Environment:23.1℃/48%RH/101.0kPa
Test Engineer: Jiang tao

Test Voltage:AC 120V/60Hz
Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1603.4000	48.67	41.20	-7.47	74.00	32.80	100	239	Horizontal
2	2170.8000	49.15	45.17	-3.98	74.00	28.83	100	86	Horizontal
3	2469.4000	47.83	47.30	-0.53	74.00	26.70	100	225	Horizontal
4	5148.0000	48.25	42.27	-5.98	74.00	31.73	200	135	Horizontal
5	7090.5000	45.23	45.66	0.43	74.00	28.34	200	1	Horizontal
6	13107.0000	35.51	51.53	16.02	74.00	22.47	200	121	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	13107.0000	16.02	26.43	42.45	54.00	11.55	200	121	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1469.0000	48.51	41.03	-7.48	74.00	32.97	200	246	Vertical
2	2503.8000	47.22	46.60	-0.62	74.00	27.40	100	268	Vertical
3	4531.5000	49.77	41.48	-8.29	74.00	32.52	100	117	Vertical
4	7639.5000	44.34	45.88	1.54	74.00	28.12	200	301	Vertical
5	9607.5000	45.17	52.48	7.31	74.00	21.52	100	339	Vertical
6	14697.0000	35.64	53.74	18.10	74.00	20.26	200	33	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9607.9125	7.31	43.97	51.28	54.00	2.72	100	166.1	Vertical
2	14697.0000	18.10	25.46	43.56	54.00	10.44	200	33	Vertical

Mode: 3DH5
Middle Frequency (2441MHz)
Environment:23.1℃/48%RH/101.0kPa
Test Engineer: Jiang tao

Test Voltage:AC 120V/60Hz
Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1353.0000	48.01	40.21	-7.80	74.00	33.79	200	360	Horizontal
2	1893.0000	48.90	44.63	-4.27	74.00	29.37	200	194	Horizontal
3	2213.0000	49.73	46.29	-3.44	74.00	27.71	200	88	Horizontal
4	4393.5000	49.75	40.90	-8.85	74.00	33.10	200	1	Horizontal
5	5698.5000	48.54	43.16	-5.38	74.00	30.84	100	301	Horizontal
6	13092.0000	35.49	51.37	15.88	74.00	22.63	200	340	Horizontal

AV Final Data List								
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Polarity
1	13092.0000	15.88	26.51	42.39	54.00	11.61	200	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1901.2000	48.25	43.66	-4.59	74.00	30.34	200	152	Vertical
2	2451.2000	48.74	47.22	-1.52	74.00	26.78	200	231	Vertical
3	4794.0000	48.86	41.71	-7.15	74.00	32.29	100	155	Vertical
4	6727.5000	46.20	45.54	-0.66	74.00	28.46	200	181	Vertical
5	9768.0000	46.05	54.92	8.87	74.00	19.08	100	340	Vertical
6	14701.5000	36.38	54.66	18.28	74.00	19.34	100	286	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9763.7600	8.87	42.64	51.51	54.00	2.49	100	157.2	Vertical
2	14701.5000	18.28	25.42	43.70	54.00	10.30	100	286	Vertical

Mode: 3DH5
Highest Frequency (2480MHz)
Environment:23.1℃/48%RH/101.0kPa Test Voltage:AC 120V/60Hz
Test Engineer: Jiang tao Date: 2024-11-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1315.2000	48.24	40.13	-8.11	74.00	33.87	100	117	Horizontal
2	2249.2000	50.30	46.75	-3.55	74.00	27.25	200	62	Horizontal
3	2994.6000	47.46	47.00	-0.46	74.00	27.00	100	197	Horizontal
4	5214.0000	48.06	41.64	-6.42	74.00	32.36	100	112	Horizontal
5	8707.5000	41.15	47.36	6.21	74.00	26.64	100	112	Horizontal
6	13104.0000	35.28	51.38	16.10	74.00	22.62	200	258	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	13104.0000	16.10	26.43	42.53	54.00	11.47	200	258	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1409.4000	49.34	41.24	-8.10	74.00	32.76	100	210	Vertical
2	2294.2000	48.82	45.18	-3.64	74.00	28.82	100	36	Vertical
3	2654.0000	49.19	46.87	-2.32	74.00	27.13	200	340	Vertical
4	5865.0000	47.85	43.43	-4.42	74.00	30.57	100	60	Vertical
5	9919.5000	44.12	52.44	8.32	74.00	21.56	100	335	Vertical
6	14703.0000	36.00	54.22	18.22	74.00	19.78	100	33	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9920.0725	8.32	43.40	51.72	54.00	2.28	100	338.7	Vertical
2	14703.0000	18.22	25.31	43.53	54.00	10.47	100	33	Vertical

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2 Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum setting:
a. Peak Setting 1GHz–26.5GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
b. AV Setting 1GHz–26.5GHz, Set RBW=1MHz, if the EUT is configured to transmit with duty cycle ≥98%,set VBW≤RBW/100 (i.e.,10kHz) but not less than 10 Hz. if the EUT duty cycle is＜98%,set VBW≥1/T, Where T is defined in section 2.7.

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Above 18GHz:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

All models were pretested and only the worst modes were recorded in this report(3DH5_2402MHz).

Environment: 25.5℃/53%RH/101.0kPa Voltage:AC 120V/60Hz
Tested By: Wen wenwen Date: 2024-10-27

Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Level for 1m [dBμV/m]	Level for 3m [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18495.125	48.46	51.15	41.61	2.69	74	32.39	100	254	Horizontal
2	19211.675	49.39	52.5	42.96	3.11	74	31.04	150	77	Horizontal
3	20036.175	48.35	52.08	42.54	3.73	74	31.46	100	338	Horizontal
4	20948.225	48.46	52.52	42.98	4.06	74	31.02	100	310	Horizontal
5	21797.375	48.54	52.35	42.81	3.81	74	31.19	150	77	Horizontal
6	24728.6	45.18	50.69	41.15	5.51	74	32.85	100	77	Horizontal

Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Level for 1m [dBμV/m]	Level for 3m [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18902.7	48.93	52.09	42.55	3.16	74	31.45	100	195	Vertical
2	19163.65	48.8	52.31	42.77	3.51	74	31.23	150	77	Vertical
3	20125.425	47.93	52.22	42.68	4.29	74	31.32	100	340	Vertical
4	21665.625	47.74	51.92	42.38	4.18	74	31.62	100	310	Vertical
5	23274.675	46.41	51.41	41.87	5.00	74	32.13	150	106	Vertical
6	24742.625	45.96	52	42.46	6.04	74	31.54	100	310	Vertical

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2 Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Above 18G test distance is 1m, so the Level for 3m= Level for 1m + 20*log(1/3)