Test Report

Verified code: 357634

Report No.: E202407050641-5

Customer:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China
Sample Name:	Multimedia Player Assembly
Sample Model:	TR4314/40
Receive Sample Date:	Jul.09,2024
Test Date:	Jul.27,2024 ~ Aug.11,2024
Reference Document:	47 CFR Part 15 Subpart C Intentional Radiators
Test Result:	Pass

Prepared by: Huang Lifang

Reviewed by: Wu Haoting

Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-10-22

GRG METROLOGY & TEST GROUP CO., LTD.
Address: No.163,Pingyun Road, West of Huangpu Avenue, Guangzhou, Guangdong, China
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Statement

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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	E202407050641-5	Original Issue	2024-10-08

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1. TEST RESULT SUMMARY

47 CFR Part 15 Subpart C 15.247, ANSI C63.10-2020 KDB 558074 D01 15.247 measurement guidance v05r02			
Standard	**Item**	**Limit / Severity**	**Result**
FCC 47 CFR Part 15 Subpart C (15.247)	Antenna Requirement	Section 15.203	PASS
	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 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: The EUT antenna is PCB antenna. Max Antenna gain is 1.3dBi .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:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

2.2 MANUFACTURER

Name:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

2.3 FACTORY

Name:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Multimedia Player Assembly
Model No.:	TR4314/40
Adding Model:	TR4334/40
Model difference description:	The models are the same as function：RAM, RF module, storage capacity, Bluetooth chip, GNSS chip, FM, AM and DAB chip, Ethernet function, only the mounting bracket are different.
Trade Name:	 Great Wall
FCC ID:	2AEQTTR431440
Power supply:	DC 12V,15A.
Frequency Range:	2402MHz~2480MHz
Transmit Power:	GFSK:8.14 dBm π/4-DQPSK:9.81dBm 8DPSK:10.19dBm

Type of Modulation:	GFSK for 1Mbps, π/4-DQPSK for 2Mbps,8DPSK for 3Mbps
Antenna Specification:	1.3dBi
Temperature Range:	-40℃~+85℃
Hardware Version:	HW001
Software Version:	SW001
Sample No:	E202407050641-0002, E202407050641-0003
Note:	1.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. 2. The model TR4314/40 was tested and recorded in this report.

2.5 TEST OPERATION MODE

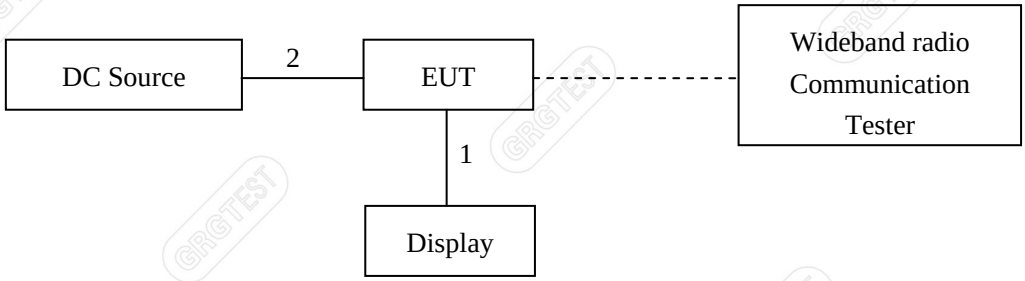
Mode No.	Description of the modes
1	Bluetooth(BT) fixed frequency transmitting

2.6 LOCAL SUPPORTIVE

Name of equipment	Manufacturer	Model	Serial number	Note
DC Source	Keysight	E36231A	/	/
Display	Desay sv	7912102XPW42A	P69001129840	/
Wideband radio Communication Tester	R&S	CMW500	144611-nC	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	Corresponding cable	1	No	0	1.0m
2	DC cable	1	No	0	1.5m

2.7 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

Software version	Test level
/	/

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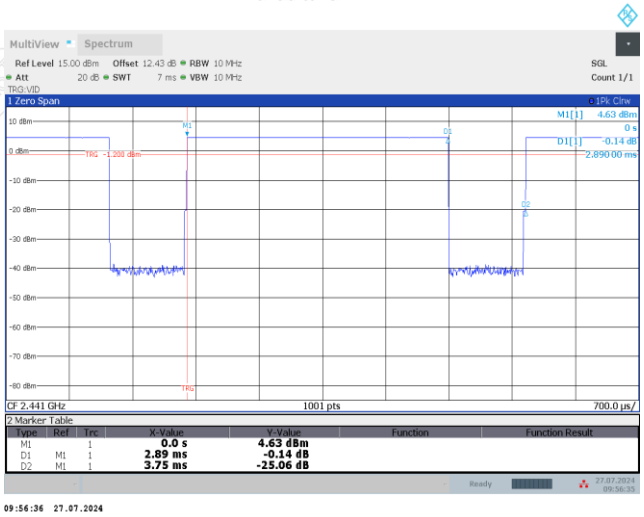
2.8 DUTY CYCLE

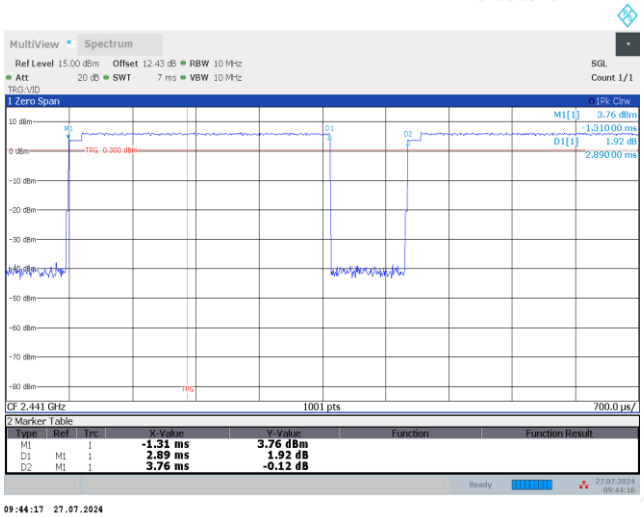
EUT Name	Multimedia Player Assembly	Model	TR4314/40
Environmental Conditions	25.9℃/45%RH/101.0kPa	Test Voltage	DC 12V
Tested By	Qin Tingting	Tested Date	2024-07-27

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	DC [%]	T [s]
DH5	Ant1	2441	2.89	3.75	77.07	0.00289
2DH5	Ant1	2441	2.89	3.76	76.86	0.00289
3DH5	Ant1	2441	2.90	3.76	77.13	0.00290

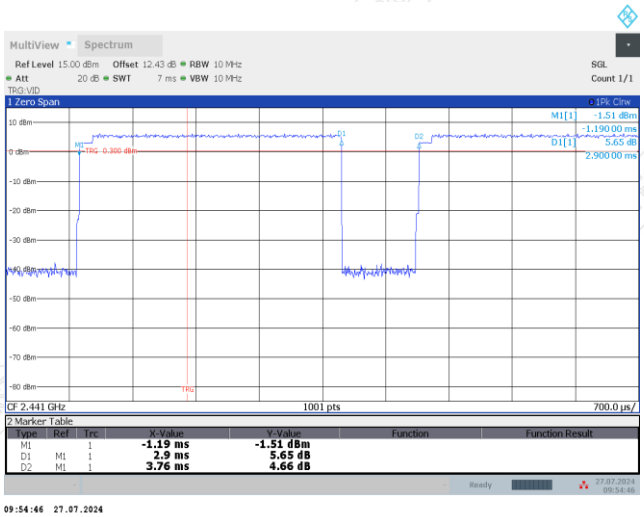
DH5_2441MHz



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 laboratories are 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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4. 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)]

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.80dB
Power spectral density conducted	0.80dB
Occupied channel bandwidth	0.40dB
Unwanted emission, conducted	0.70dB
Humidity	6.0%
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.

5. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Radiated Spurious Emission&Restricted bands of operation				
Test Receiver	R&S	ESR26	101758	2024-09-22
Spectrum Analyzer	R&S	FSV3044	101184	2025-07-19
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3402	2024-10-06
Loop Antenna	Schwarzbeck	FMZB 1513-60	1513-60-56	2025-05-07
Preamplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G41	20200928002	2024-10-24
Horn Antenna	Schwarzbeck	BBHA9120D	02143	2024-09-23
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2024-09-18
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		
20dB Bandwidth& Carrier Frequencies Separated & Hopping Channel Number & Dwell Time &Conducted band edges and Spurious Emission				
Spectrum Analyzer	R&S	FSW43	102072	2025-06-14
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2024-12-28
BT/WIFI System	Tonscend	JS1120-3		
Maximum Peak Output Power				
Pulse power sensor	Anritsu	MA2411B	1126150	2025-01-11
Power meter	Anritsu	ML2495A	1204003	2025-01-11

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

6. E.U.T. TEST CONDITIONS

Type of antenna: PCB

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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7. 20dB BANDWIDTH

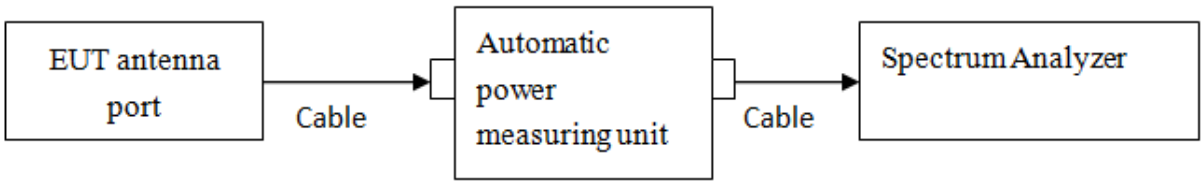
7.1 LIMITS

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.

7.2 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=30 kHz, VBW=100 kHz, Span=3MHz, Sweep = auto. Allow the trace to stabilize, record 20dB bandwidth value
3) Repeat until all the test channels are investigated.

7.3 TEST SETUP



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7.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

Test Mode	Antenna	Channel	Frequency [MHz]	20 dB Bandwidth [MHz]
DH5	Ant1	Lowest	2402	1.01
		Middle	2441	0.96
		Highest	2480	0.96
2DH5	Ant1	Lowest	2402	1.36
		Middle	2441	1.35
		Highest	2480	1.34
3DH5	Ant1	Lowest	2402	1.34
		Middle	2441	1.33
		Highest	2480	1.35

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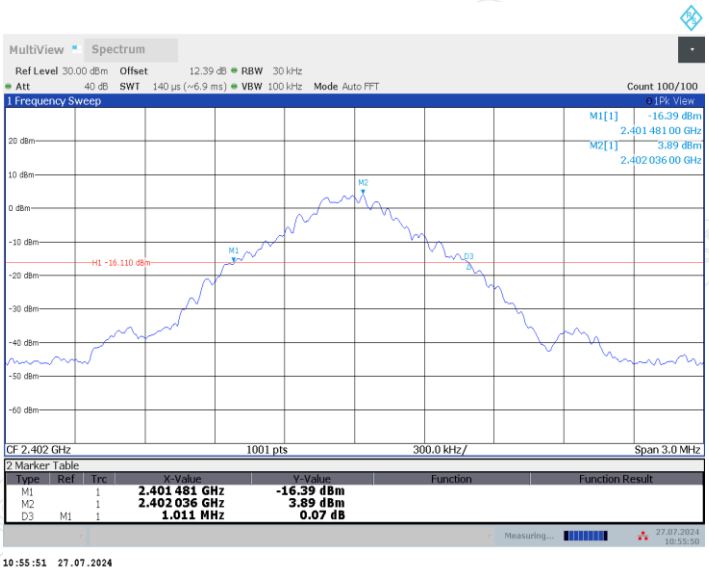
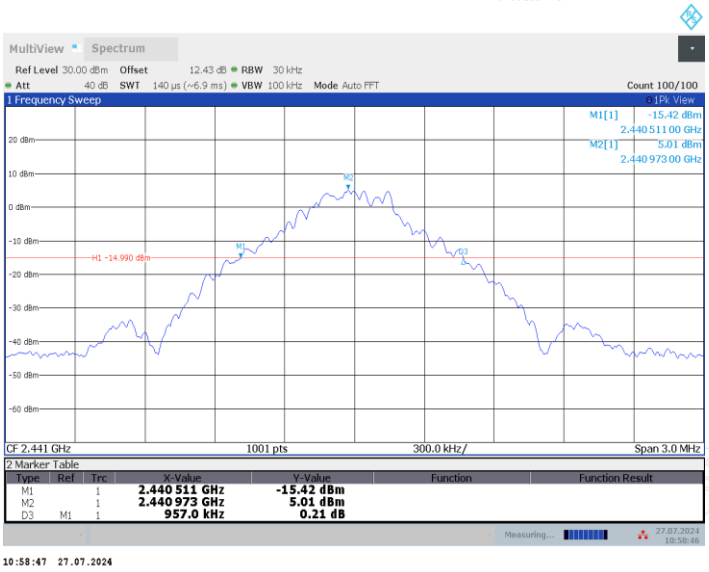
Test Graphs

DH5

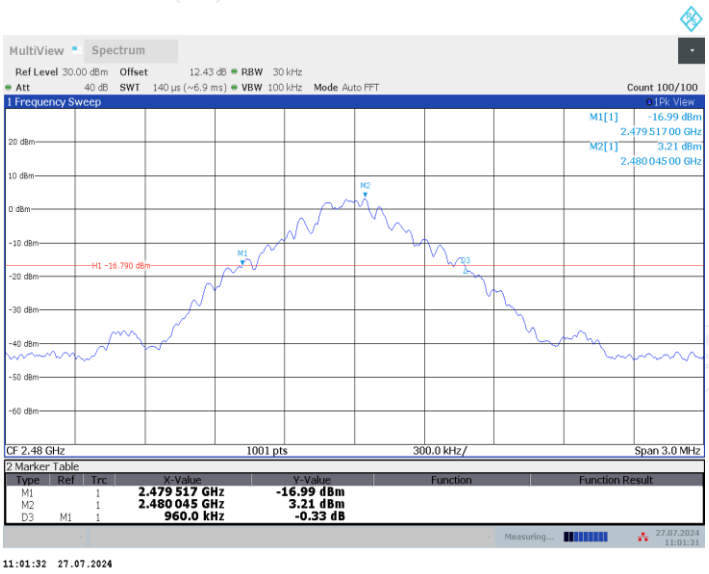
Lowest Channel



Middle Channel

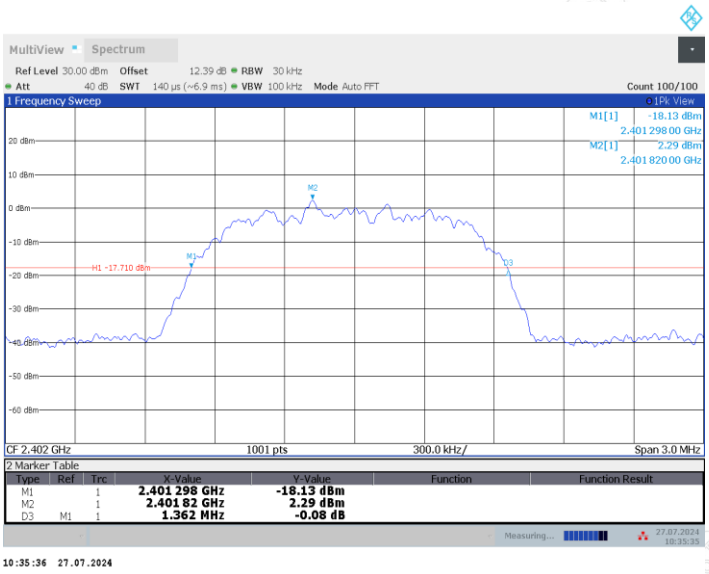


Highest Channel

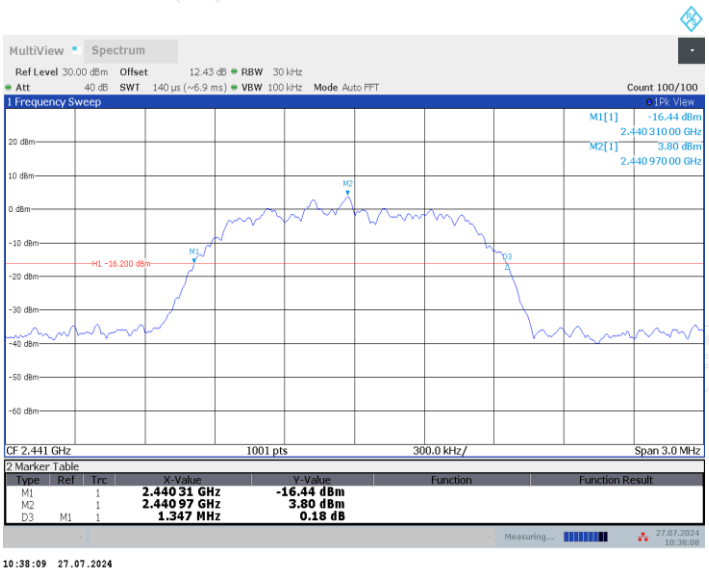


2DH5

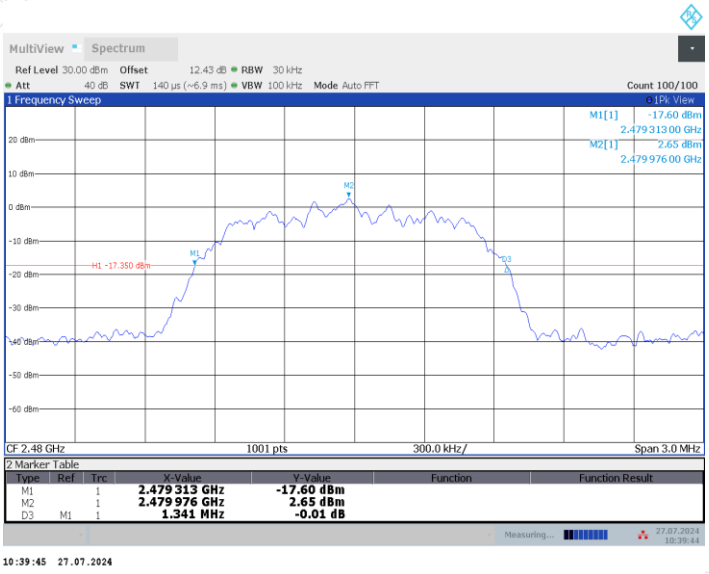
Lowest Channel



Middle Channel

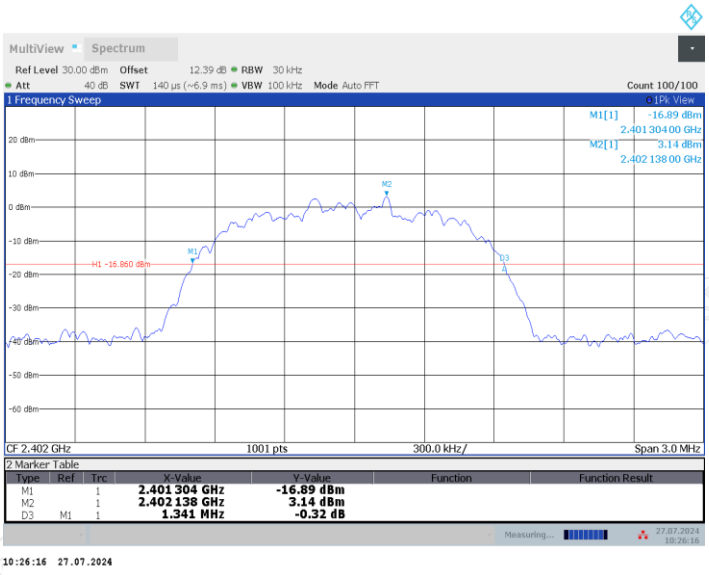


Highest Channel

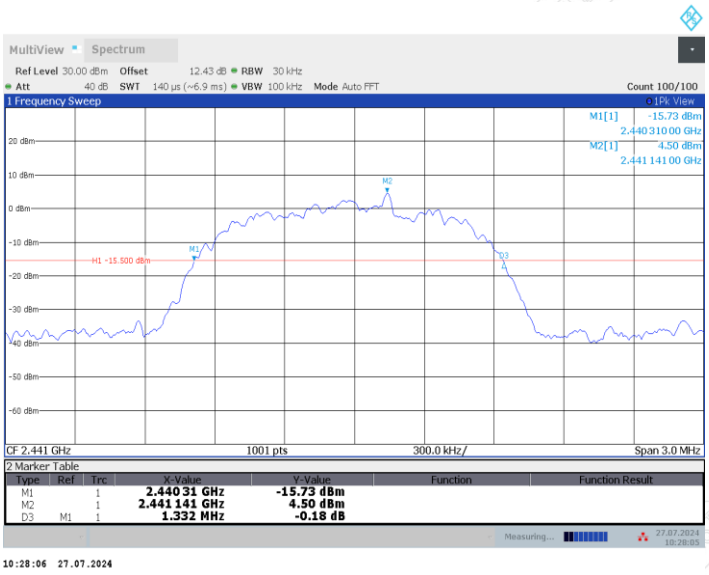


3DH5

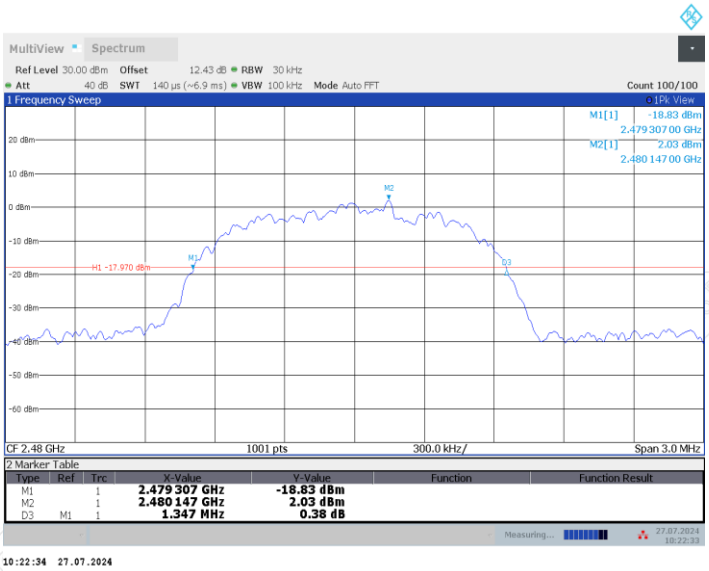
Lowest Channel



Middle Channel



Highest Channel



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8. CARRIER FREQUENCIES SEPARATED

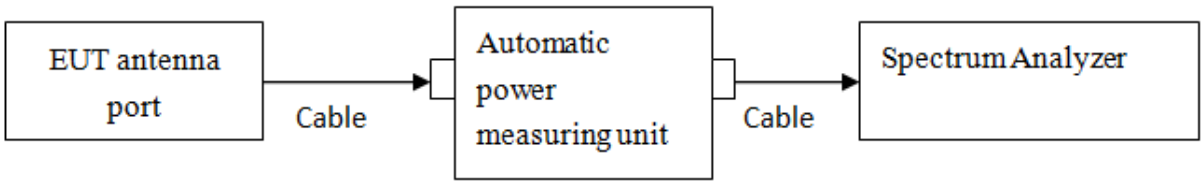
8.1 LIMITS

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.

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 center frequency of spectrum analyzer = middle of hopping channel.
3) Set the spectrum analyzer as RBW=300kHz, VBW=300kHz, Adjust Span to 2MHz, Sweep = auto
4) Use the marker-delta function to mark hopping channel carrier frequencies and record the channel separation.

8.3 TEST SETUP



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8.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

Test Mode	Antenna	Freq[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.036	≥0.673	PASS
2DH5	Ant1	Hop	0.978	≥0.907	PASS
3DH5	Ant1	Hop	1.008	≥0.900	PASS

NOTE: Limit[MHz]= 20 dB Bandwidth [MHz]*2/3.

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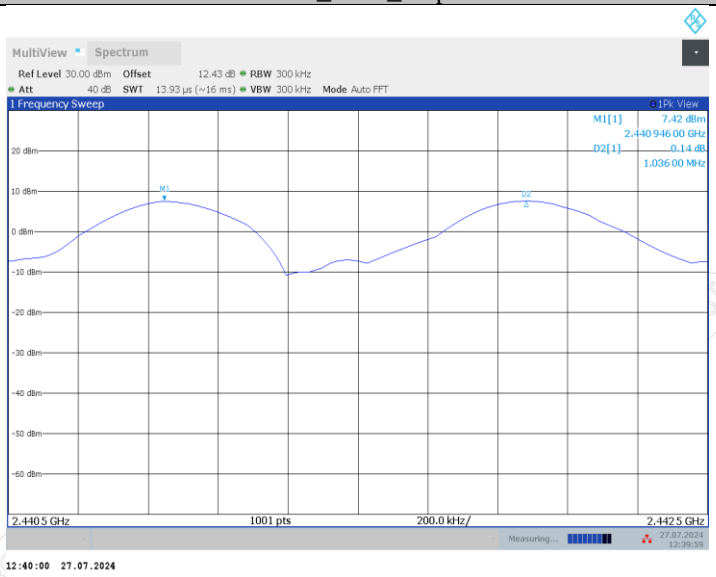
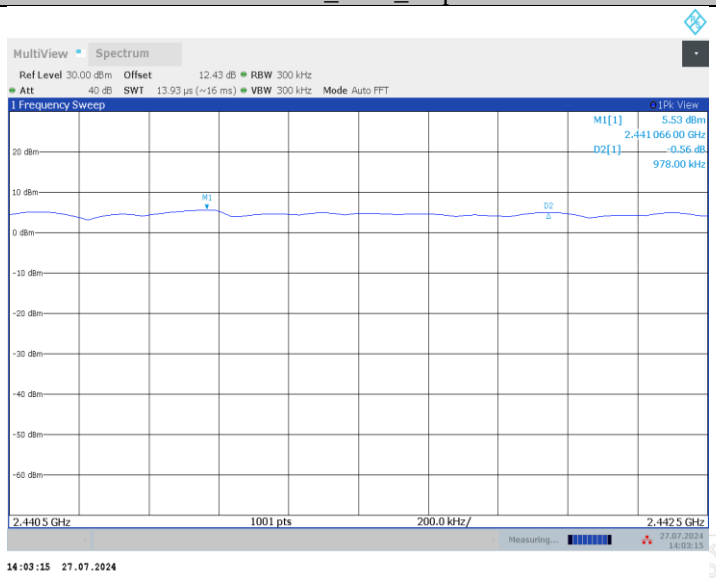
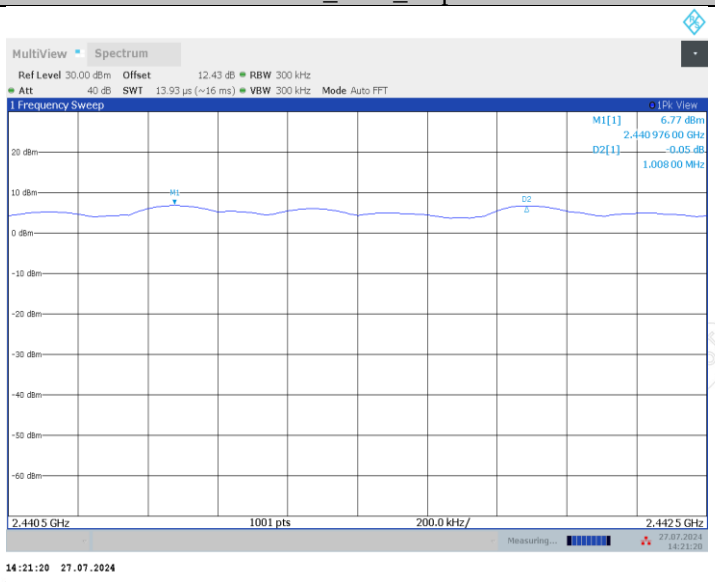
Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop


3DH5_Ant1_Hop


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9. HOPPING CHANNEL NUMBER

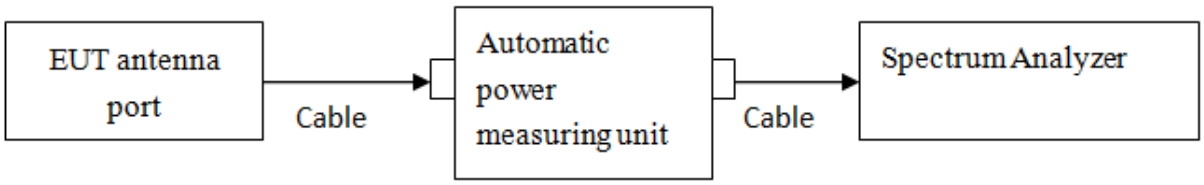
9.1 LIMITS

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

9.2 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=300kHz, VBW=300kHz.
3) Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

9.3 TEST SETUP



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9.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

Test Mode	Antenna	Freq[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

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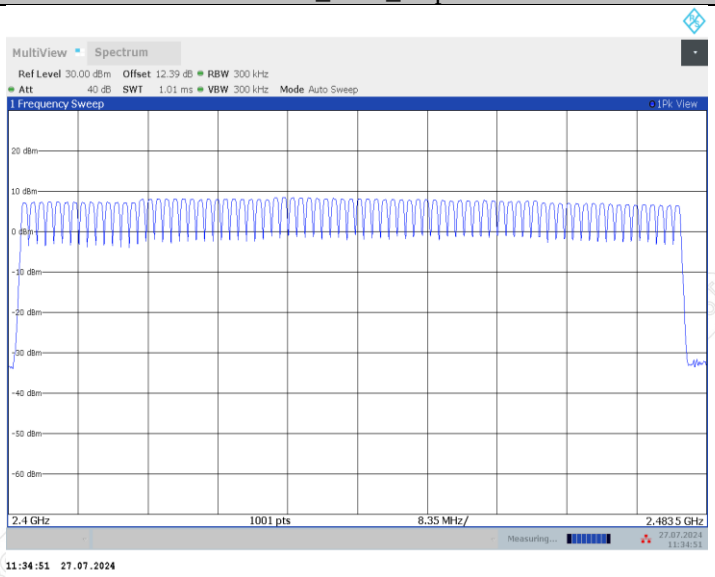
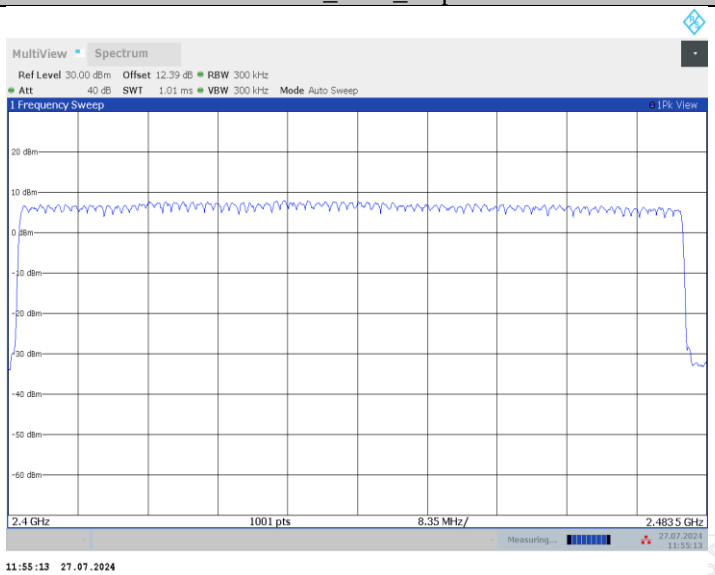
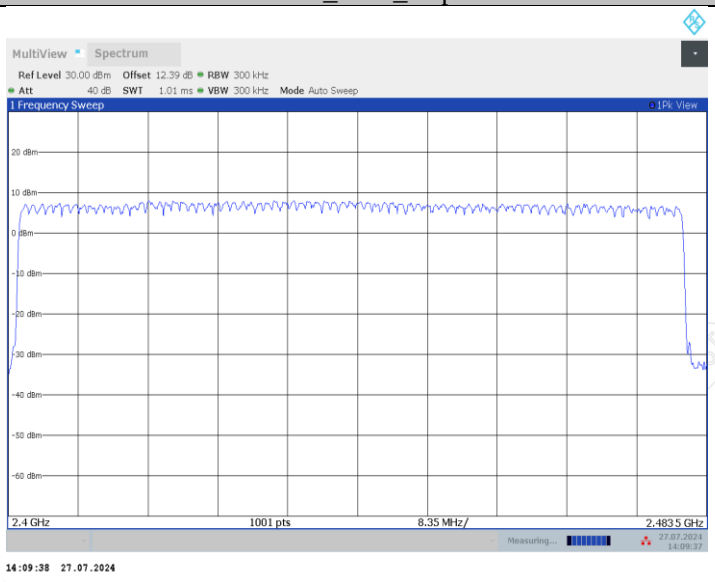
Test Graphs

DH5_Ant1_Hop


2DH5_Ant1_Hop


3DH5_Ant1_Hop


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10. DWELL TIME

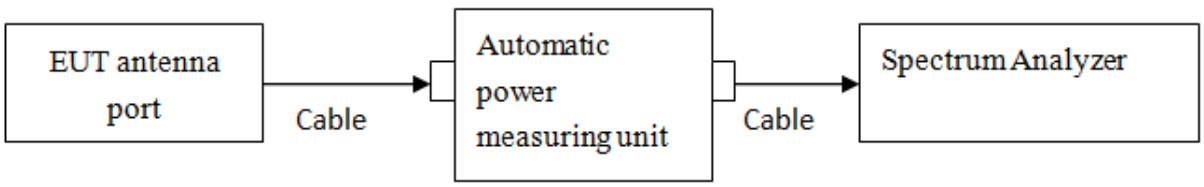
10.1 LIMITS

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.

10.2 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 = Clear Write;
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

10.3 TEST SETUP



10.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

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

Test Mode	Antenna	Freq[MHz]	Burst Width [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.413	320	0.132	≤0.4	PASS
DH3	Ant1	Hop	1.649	160	0.264	≤0.4	PASS
DH5	Ant1	Hop	2.885	106.67	0.308	≤0.4	PASS
2DH1	Ant1	Hop	0.389	320	0.124	≤0.4	PASS
2DH3	Ant1	Hop	1.641	160	0.263	≤0.4	PASS
2DH5	Ant1	Hop	2.889	106.67	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.389	320	0.124	≤0.4	PASS
3DH3	Ant1	Hop	1.639	160	0.262	≤0.4	PASS
3DH5	Ant1	Hop	2.890	106.67	0.308	≤0.4	PASS

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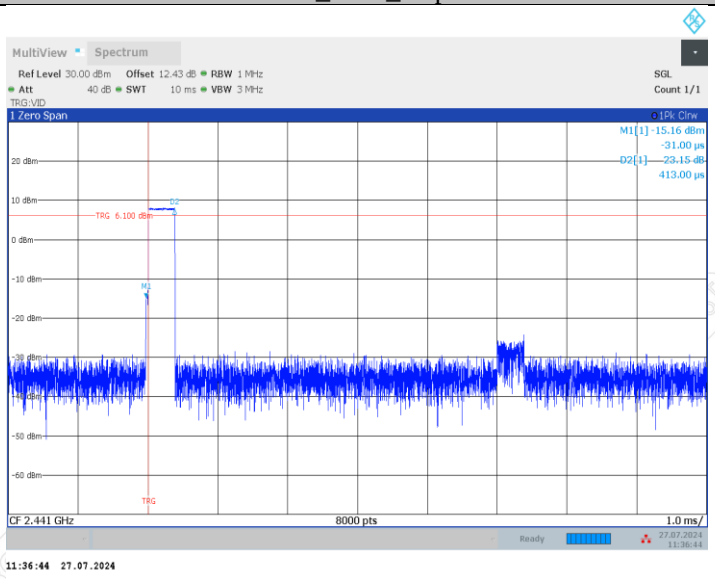
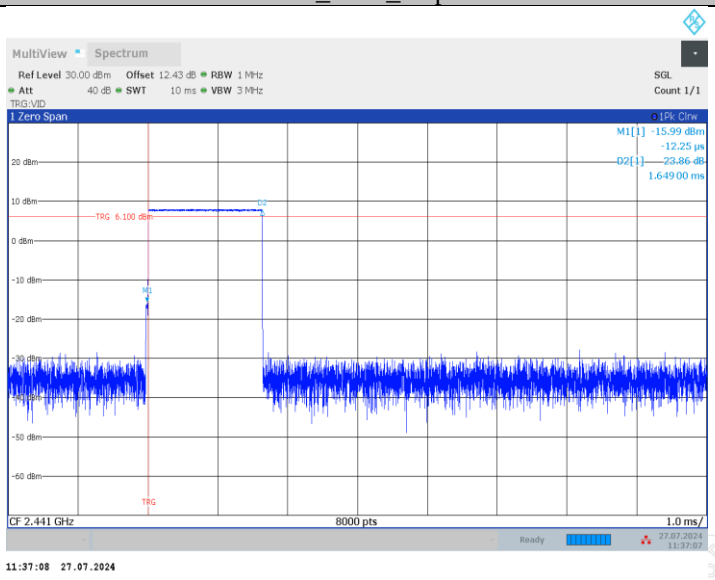
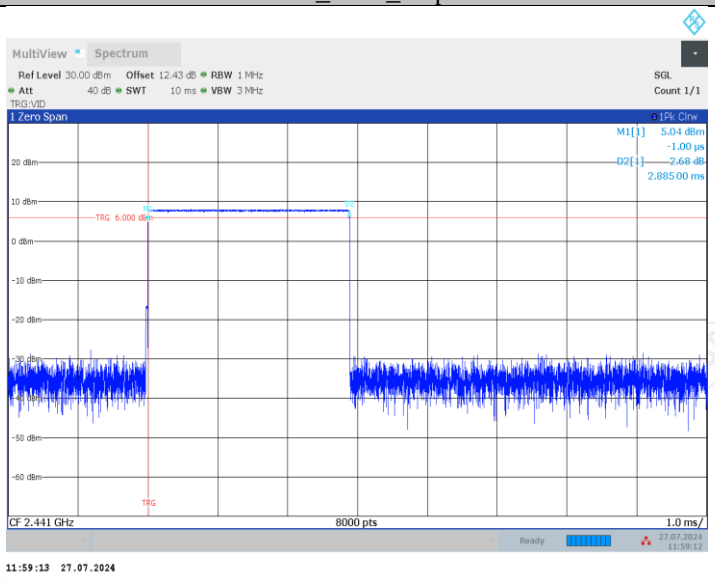
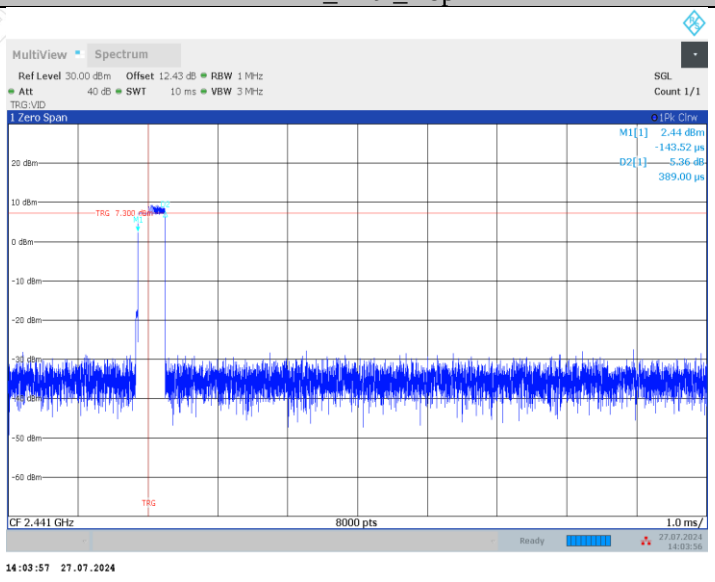
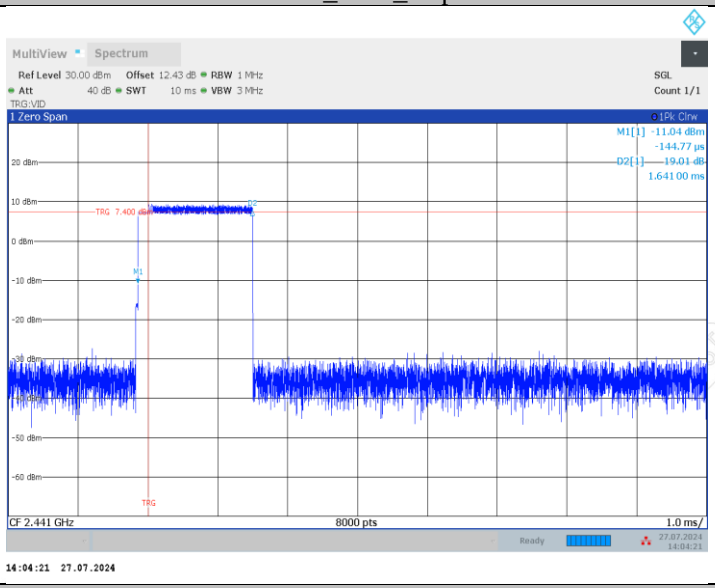
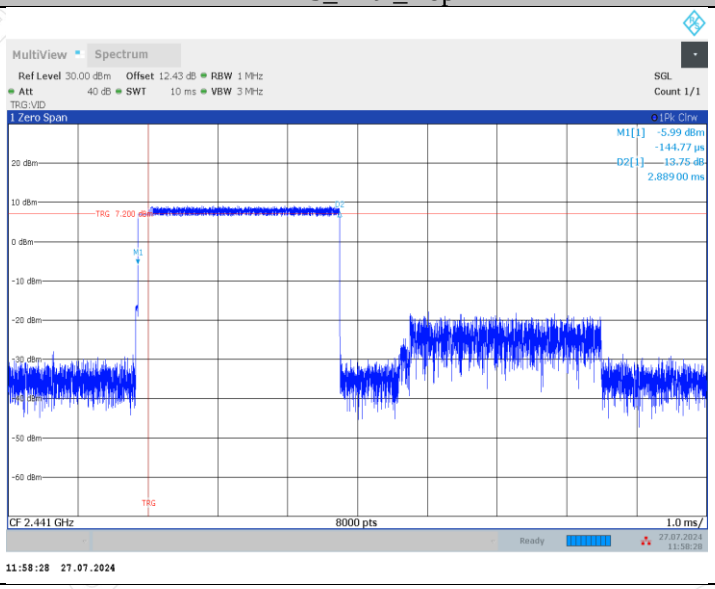
Test Graphs

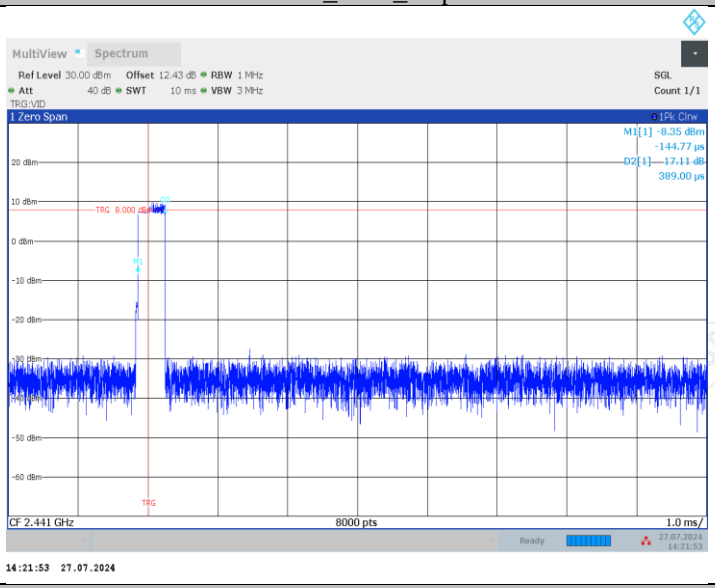
DH1_Ant1_Hop


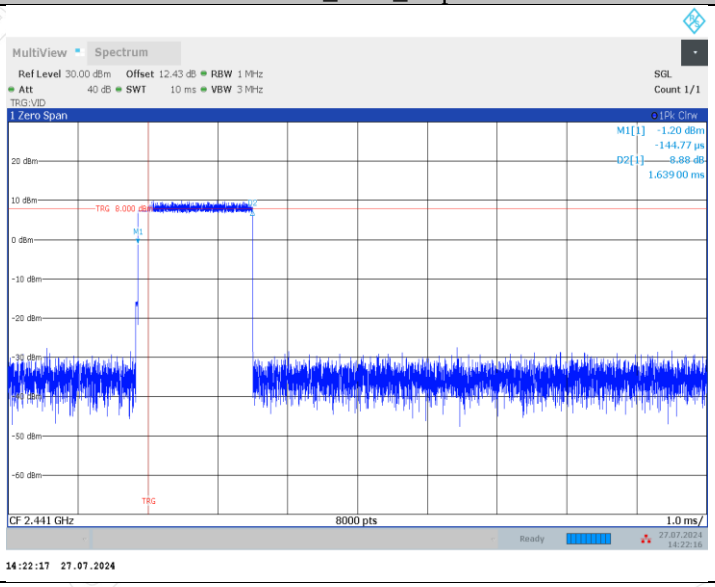
DH3_Ant1_Hop


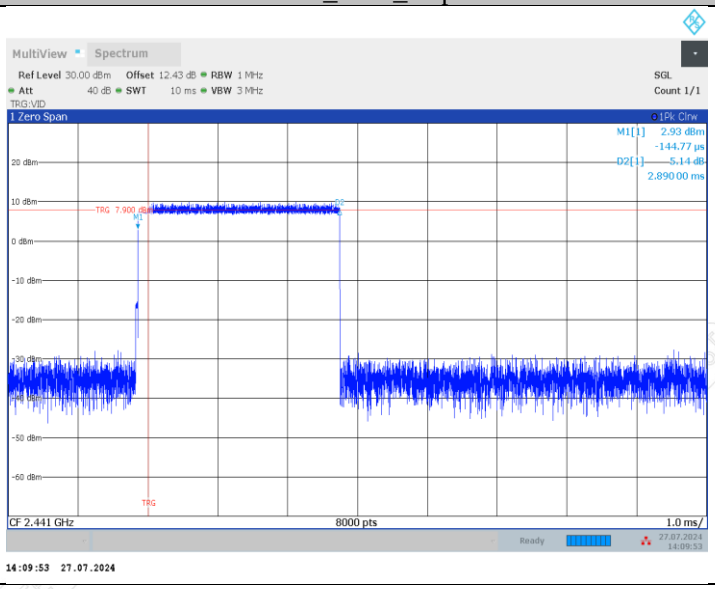
DH5_Ant1_Hop


2DH1_Ant1_Hop


2DH3_Ant1_Hop

2DH5_Ant1_Hop


3DH1_Ant1_Hop


3DH3_Ant1_Hop


3DH5_Ant1_Hop


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11. MAXIMUM PEAK OUTPUT POWER

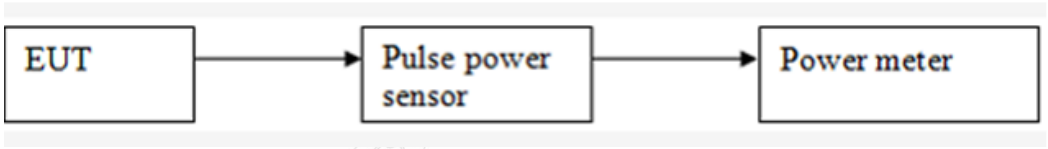
11.1 LIMITS

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.

11.2 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.

11.3 TEST SETUP



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11.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	7.01	20.97	Peak	Pass
Middle	2.441	8.14			Pass
Highest	2.480	6.80			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	8.93	20.97	Peak	Pass
Middle	2.441	9.81			Pass
Highest	2.480	8.86			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	9.33	20.97	Peak	Pass
Middle	2.441	10.19			Pass
Highest	2.480	9.22			Pass

12. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

12.1 LIMITS

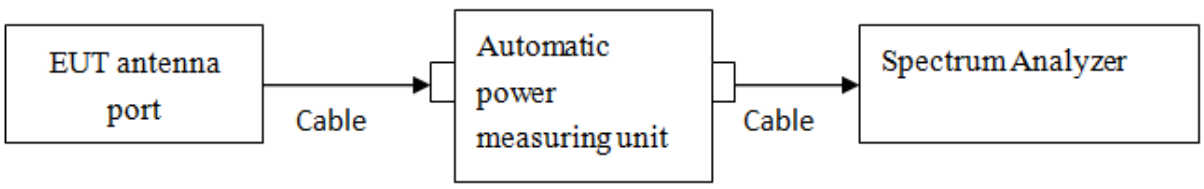
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the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

12.2 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.

12.3 TEST SETUP



12.4 TEST RESULTS

Environment: 25.9℃/45%RH/101.0kPa Voltage:DC 12V
Tested By:Qin Tingting Date: 2024-07-27

Band Edge

Test Mode	Antenna	Ch Name	Freq[MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	6.17	-46.37	≤-13.83	PASS
		High	2480	5.40	-45.06	≤-14.60	PASS
		Low	Hop_2402	6.22	-46.91	≤-13.78	PASS
		High	Hop_2480	6.55	-44.04	≤-13.45	PASS
2DH5	Ant1	Low	2402	6.24	-47.26	≤-13.76	PASS
		High	2480	5.21	-45.09	≤-14.79	PASS
		Low	Hop_2402	4.11	-47.63	≤-15.89	PASS
		High	Hop_2480	4.32	-44.43	≤-15.68	PASS
3DH5	Ant1	Low	2402	6.01	-47.1	≤-13.99	PASS
		High	2480	4.53	-45.08	≤-15.47	PASS
		Low	Hop_2402	4.42	-47.01	≤-15.58	PASS
		High	Hop_2480	5.89	-45.35	≤-14.11	PASS

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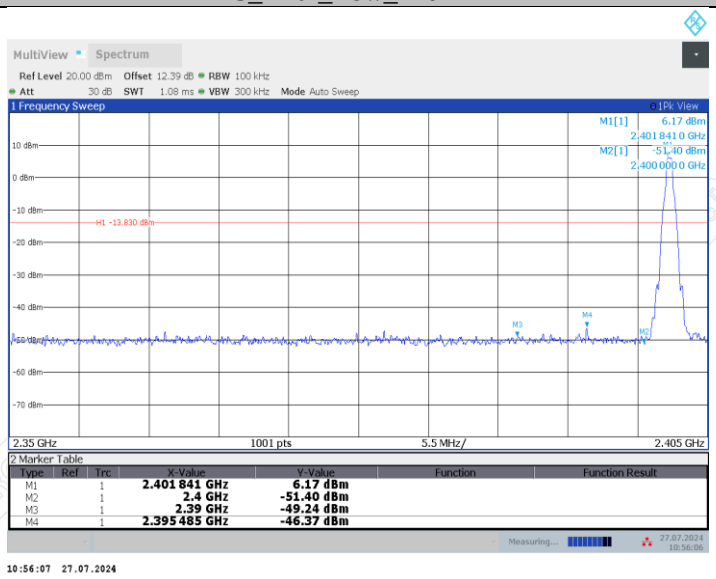
Conducted Spurious Emission

Test Mode	Antenna	Freq[MHz]	Freq Range [MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	5.59	5.59	---	PASS
			30~1000	5.59	-55.58	≤-14.41	PASS
			1000~26500	5.59	-42.08	≤-14.41	PASS
		2441	Reference	6.24	6.24	---	PASS
			30~1000	6.24	-56.12	≤-13.76	PASS
			1000~26500	6.24	-41.94	≤-13.76	PASS
		2480	Reference	4.67	4.67	---	PASS
			30~1000	4.67	-55.88	≤-15.33	PASS
			1000~26500	4.67	-41.73	≤-15.33	PASS
2DH5	Ant1	2402	Reference	4.51	4.51	---	PASS
			30~1000	4.51	-55.35	≤-15.49	PASS
			1000~26500	4.51	-41.95	≤-15.49	PASS
		2441	Reference	4.75	4.75	---	PASS
			30~1000	4.75	-55.03	≤-15.25	PASS
			1000~26500	4.75	-41.30	≤-15.25	PASS
		2480	Reference	4.02	4.02	---	PASS
			30~1000	4.02	-55.66	≤-15.98	PASS
			1000~26500	4.02	-41.55	≤-15.98	PASS
3DH5	Ant1	2402	Reference	4.46	4.46	---	PASS
			30~1000	4.46	-55.24	≤-15.54	PASS
			1000~26500	4.46	-40.73	≤-15.54	PASS
		2441	Reference	5.11	5.11	---	PASS
			30~1000	5.11	-55.46	≤-14.89	PASS
			1000~26500	5.11	-41.81	≤-14.89	PASS
		2480	Reference	3.40	3.40	---	PASS
			30~1000	3.40	-55.58	≤-16.60	PASS
			1000~26500	3.40	-40.95	≤-16.60	PASS

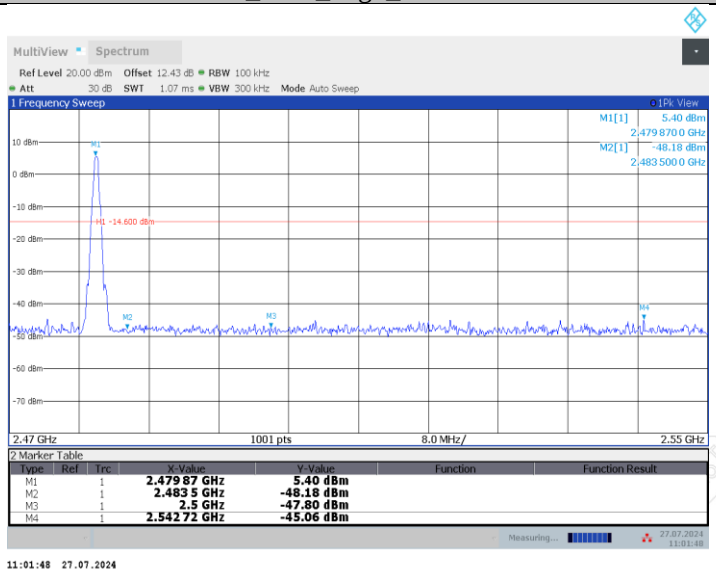
Test Graphs

Band Edge

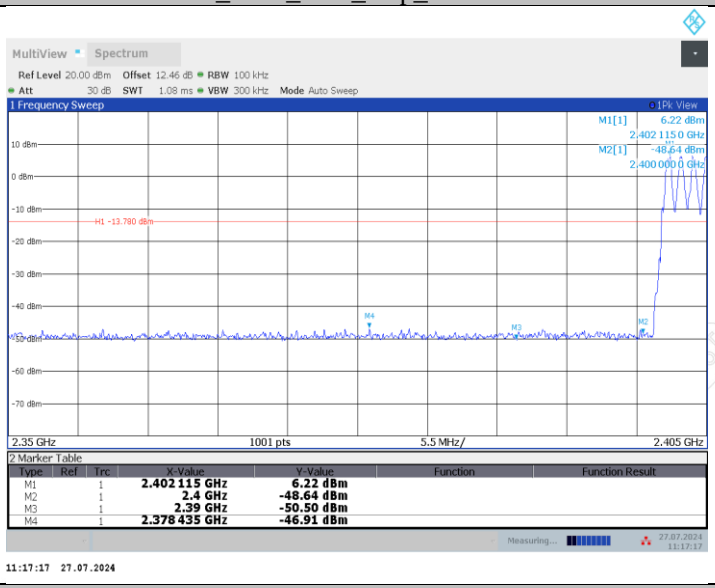
DH5_Ant1_Low_2402 MHz



DH5_Ant1_High_2480 MHz

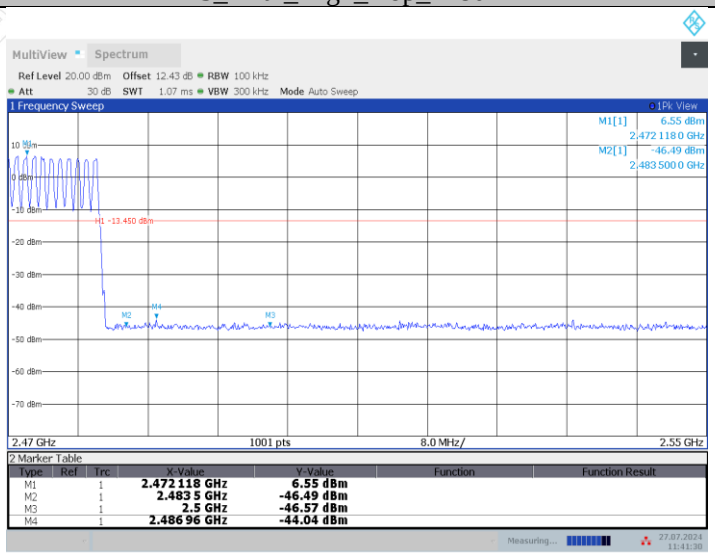


DH5_Ant1_Low_Hop_2402 MHz

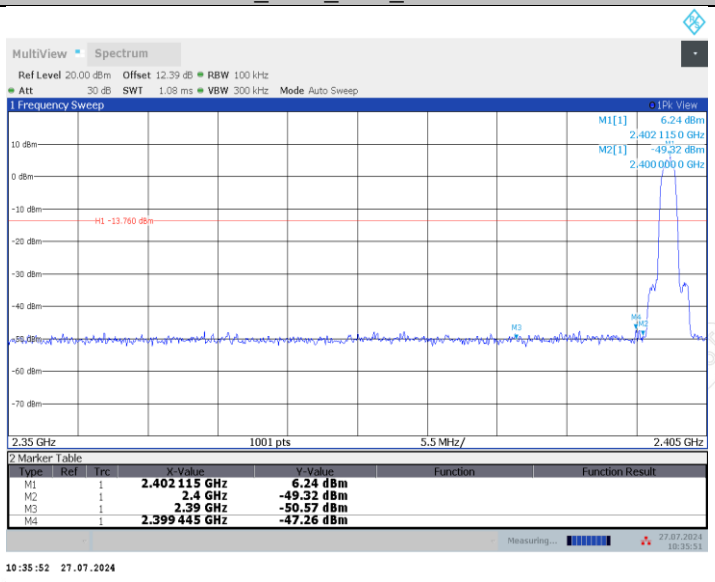
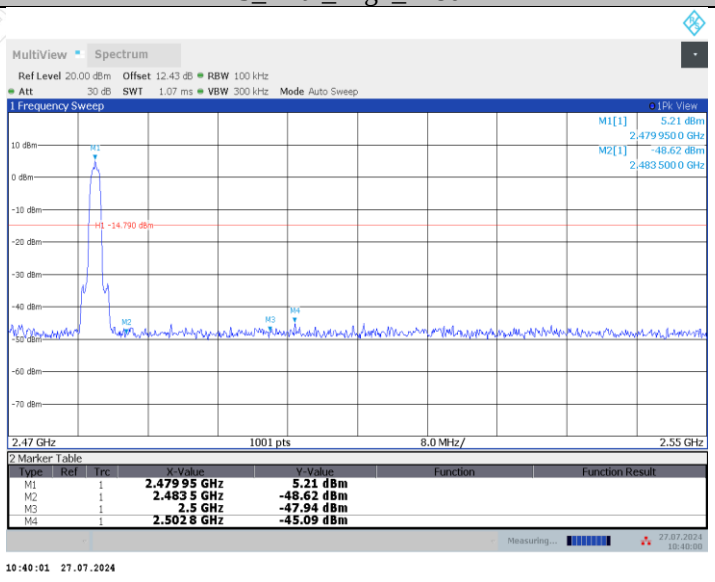


11:17:17 27.07.2024

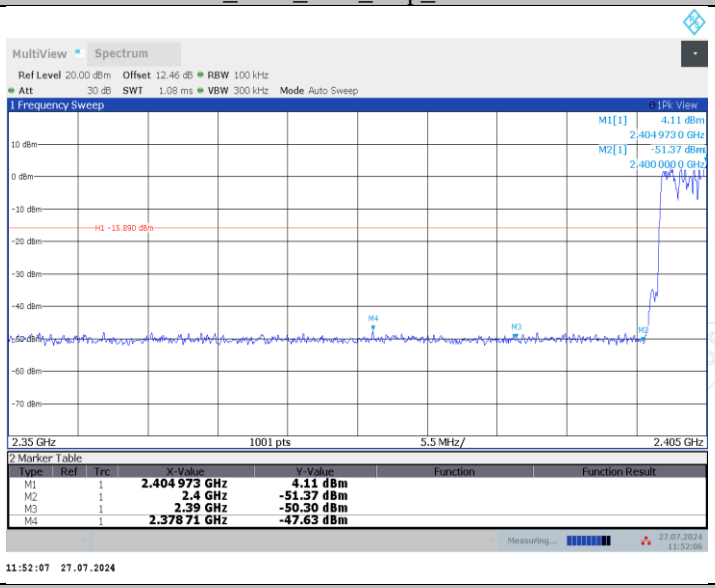
DH5_Ant1_High_Hop_2480 MHz



11:41:30 27.07.2024

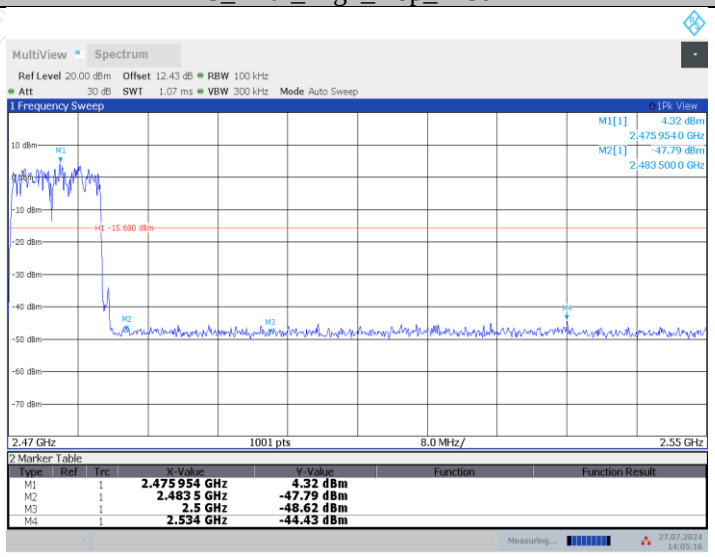
2DH5_Ant1_Low_2402 MHz

2DH5_Ant1_High_2480 MHz


2DH5_Ant1_Low_Hop_2402 MHz

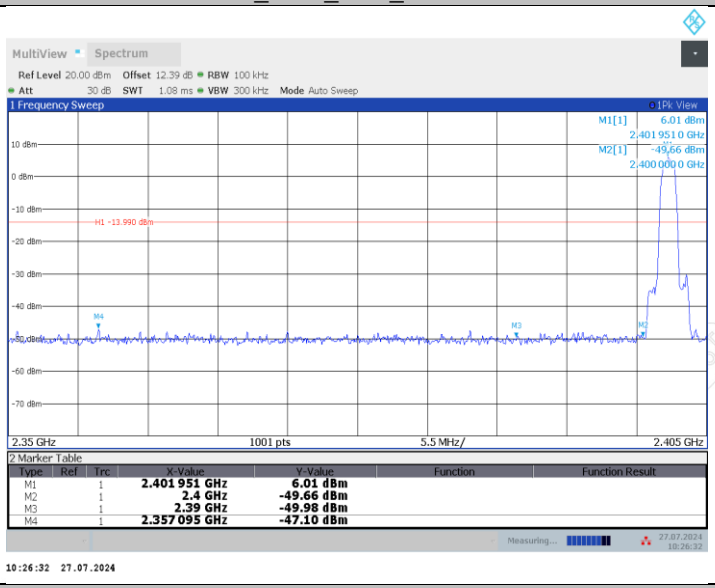


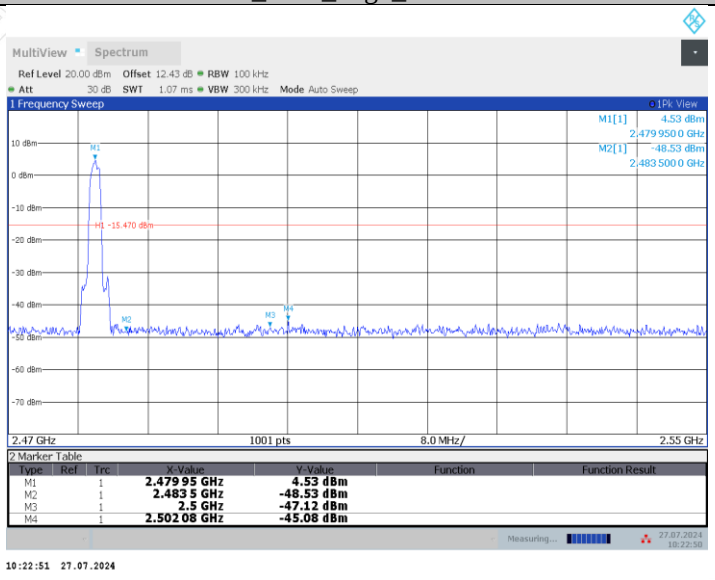
11:52:07 27.07.2024

2DH5_Ant1_High_Hop_2480 MHz

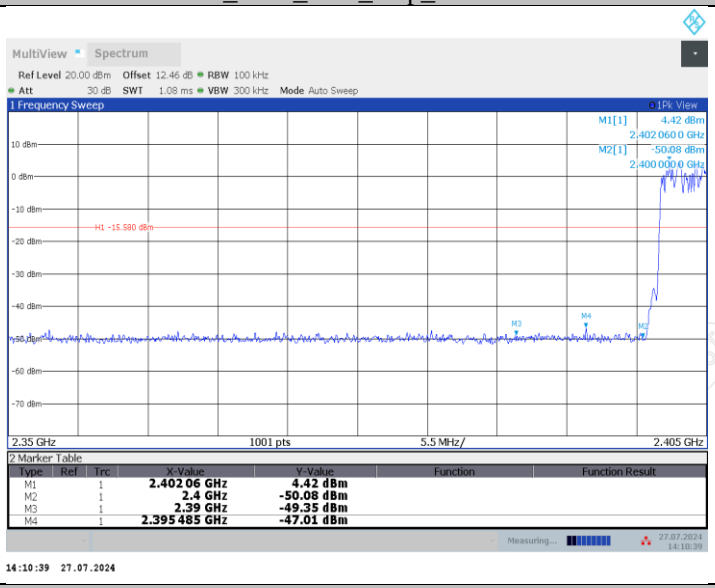


14:05:16 27.07.2024

3DH5_Ant1_Low_2402 MHz


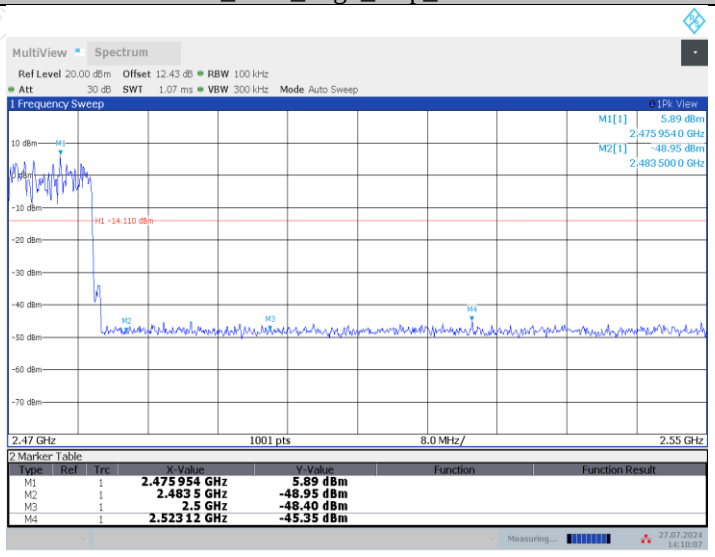
3DH5_Ant1_High_2480 MHz


3DH5_Ant1_Low_Hop_2402 MHz



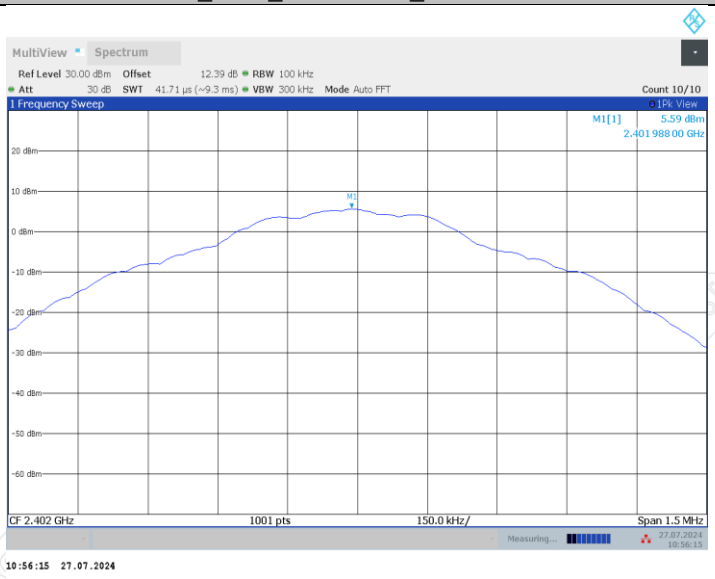
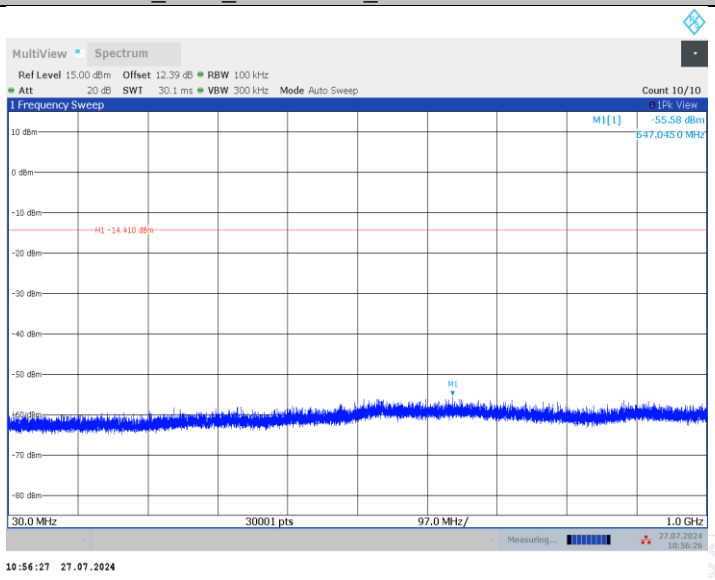
14:10:39 27.07.2024

3DH5_Ant1_High_Hop_2480 MHz

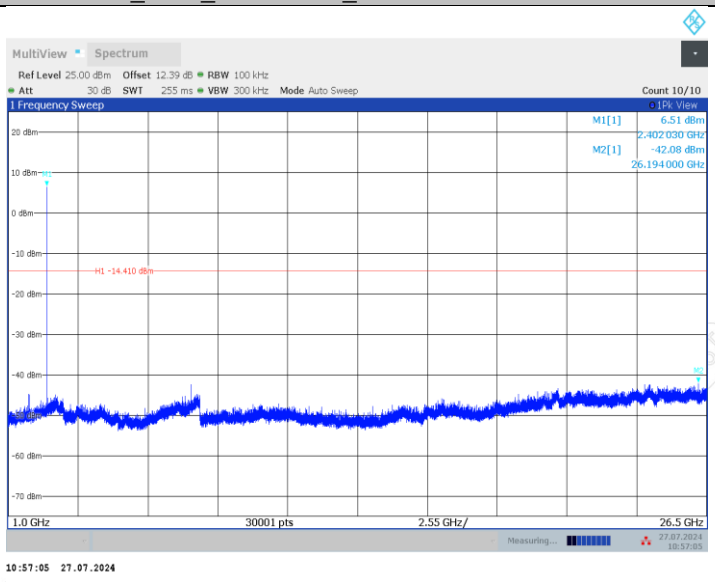


14:10:07 27.07.2024

Conducted Spurious Emission

DH5_Ant1_2402 MHz _0~Reference

DH5_Ant1_2402 MHz _30 MHz ~1000 MHz


DH5_Ant1_2402 MHz _1000 MHz ~26500 MHz



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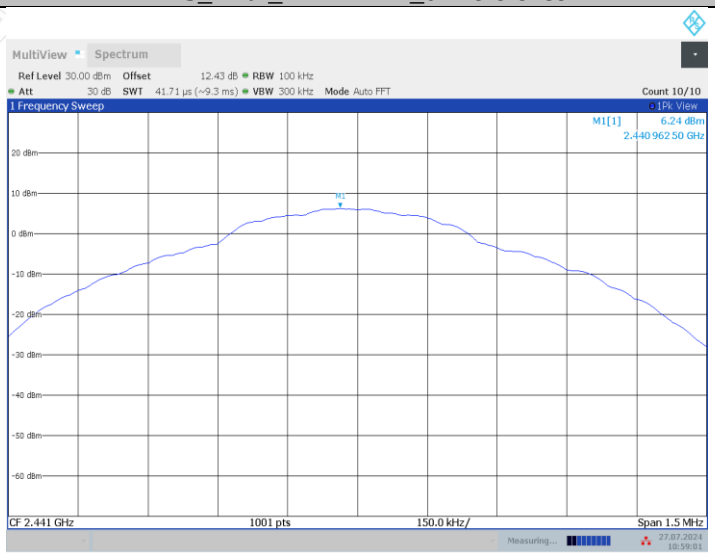
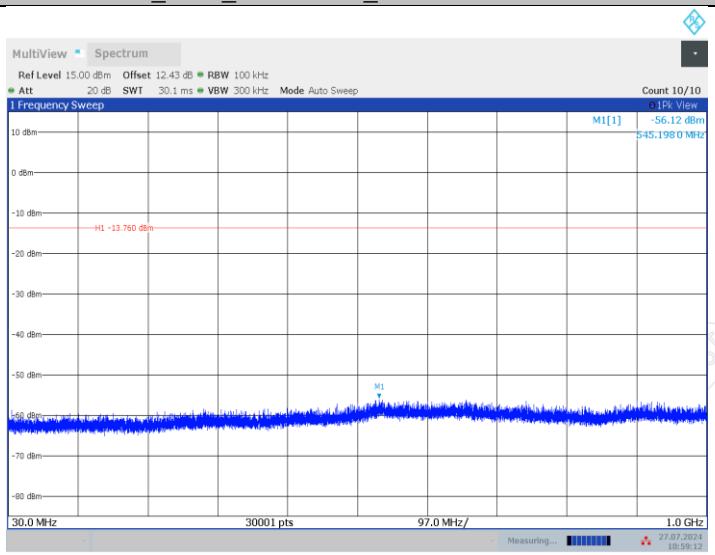
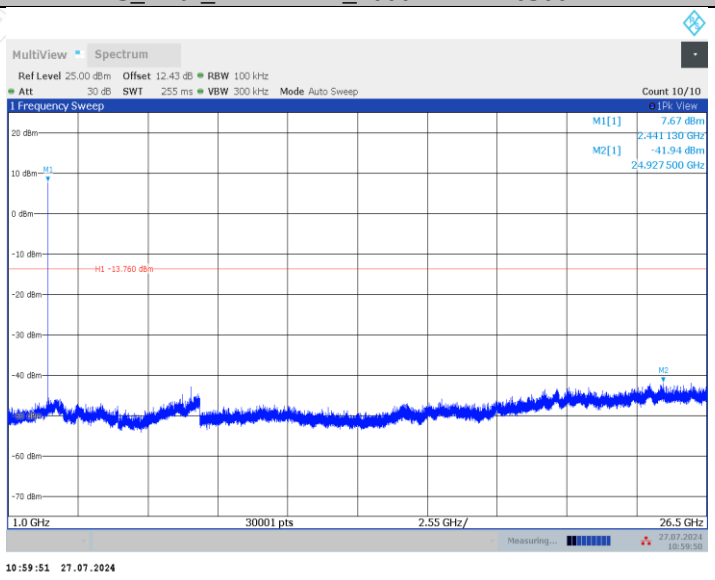
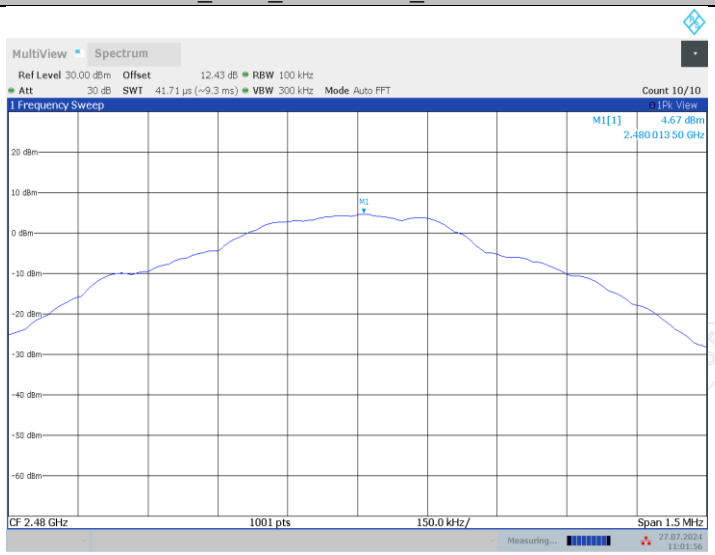
DH5_Ant1_2441 MHz _0~Reference



10:59:01 27.07.2024

DH5_Ant1_2441 MHz _30 MHz ~1000 MHz

DH5_Ant1_2441 MHz _1000 MHz ~26500 MHz


DH5_Ant1_2480 MHz _0~Reference



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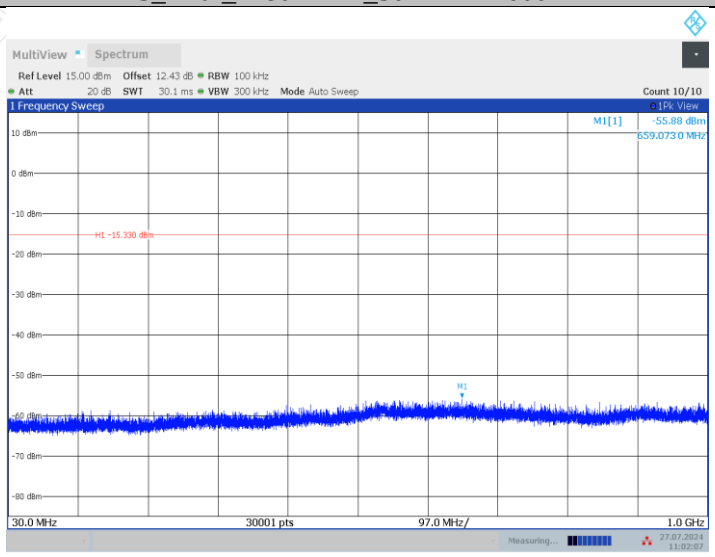
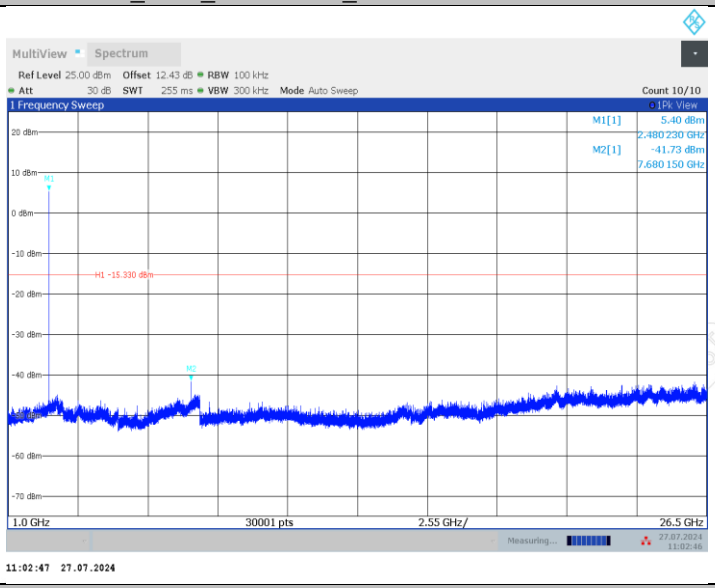
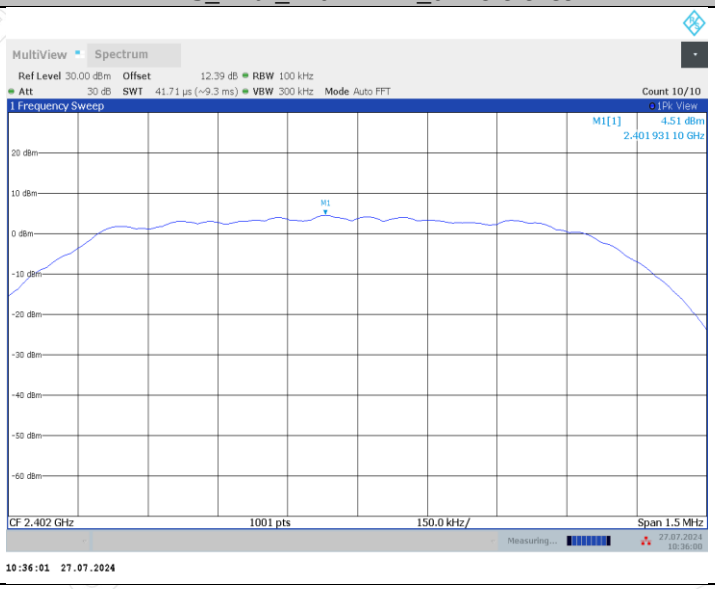
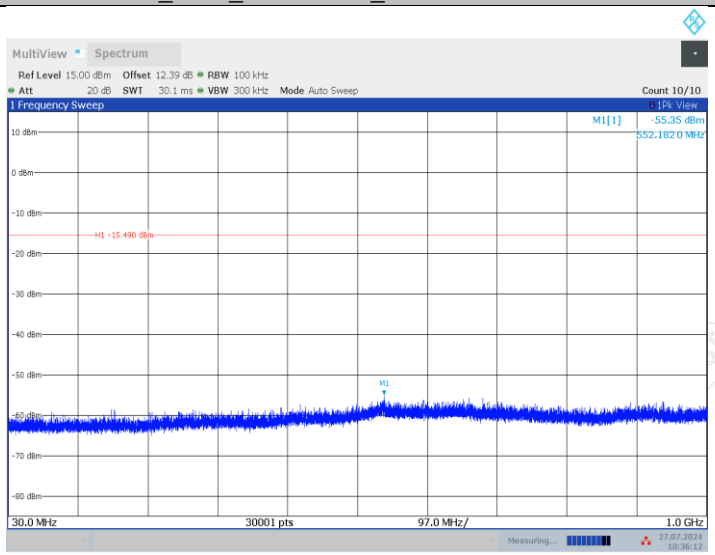
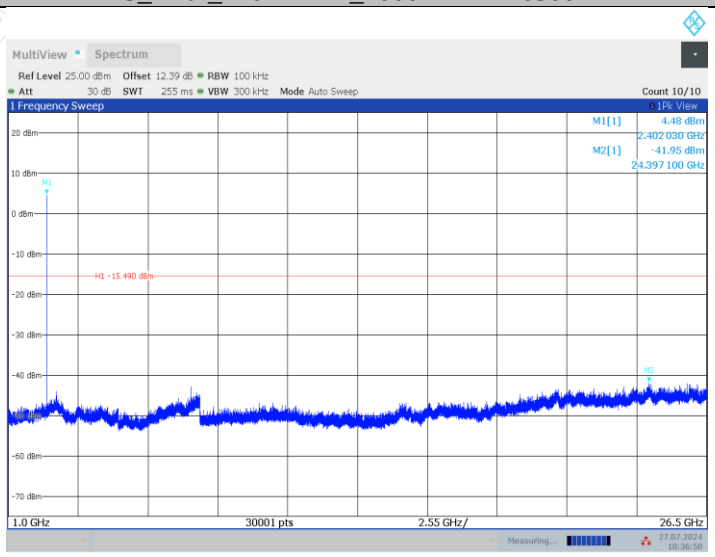
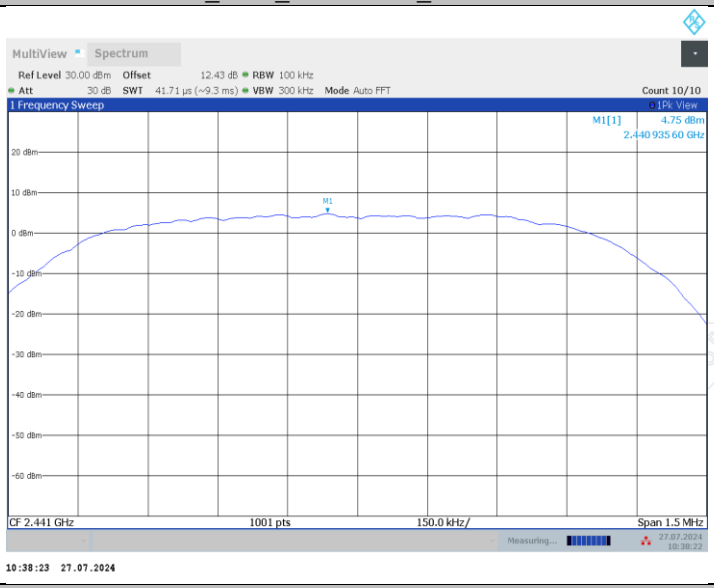
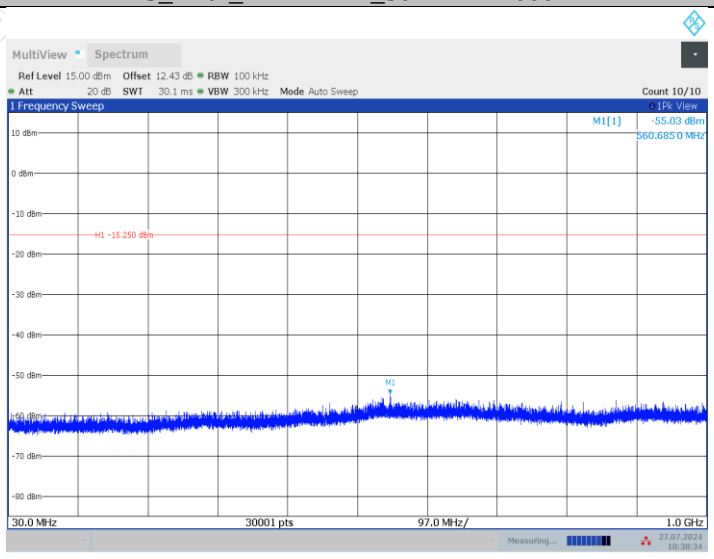
DH5_Ant1_2480 MHz _30 MHz ~1000 MHz

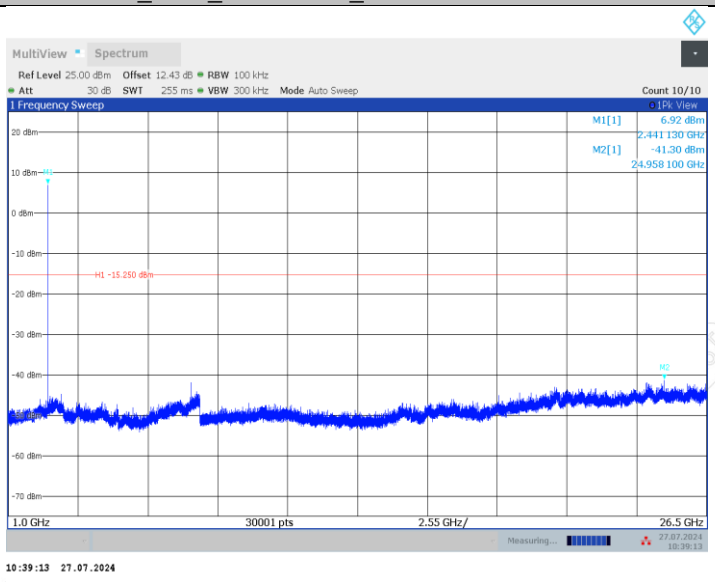
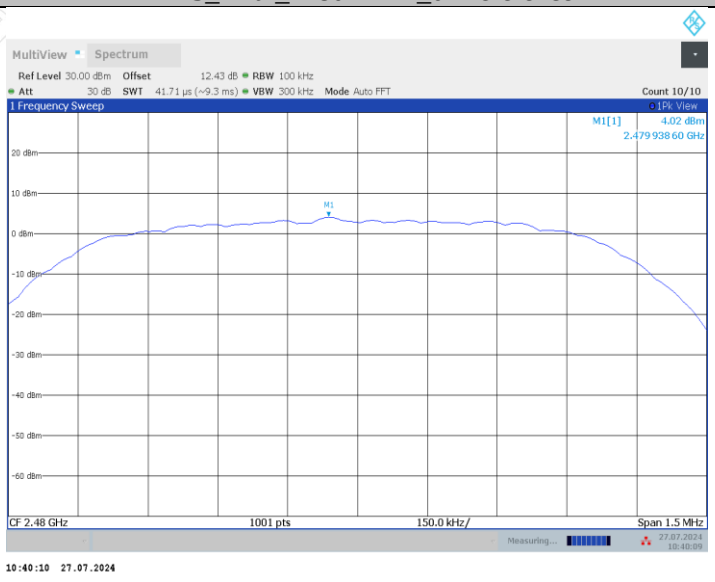


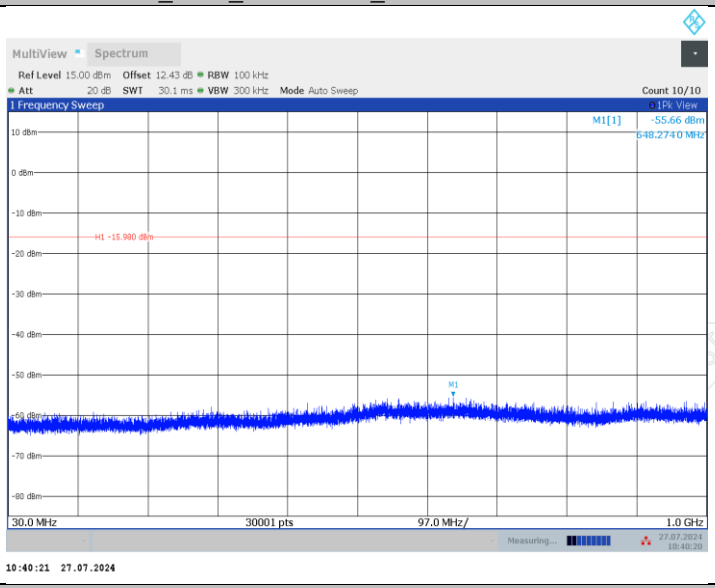
11:02:08 27.07.2024

DH5_Ant1_2480 MHz _1000 MHz ~26500 MHz

2DH5_Ant1_2402 MHz _0~Reference


2DH5_Ant1_2402 MHz _30 MHz ~1000 MHz

2DH5_Ant1_2402 MHz _1000 MHz ~26500 MHz


2DH5_Ant1_2441 MHz _0~Reference
 10:38:23 27.07.2024
2DH5_Ant1_2441 MHz _30 MHz ~1000 MHz
 10:38:35 27.07.2024

2DH5_Ant1_2441 MHz _1000 MHz ~26500 MHz

2DH5_Ant1_2480 MHz _0~Reference


2DH5_Ant1_2480 MHz _30 MHz ~1000 MHz
 10:40:21 27.07.2024
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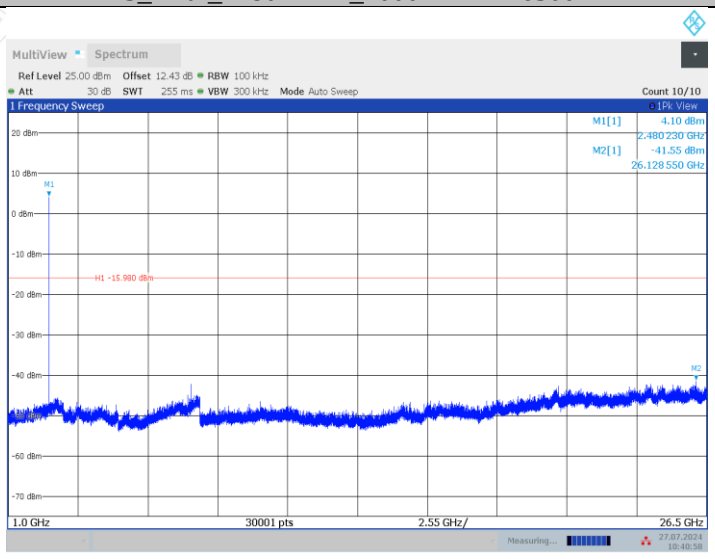
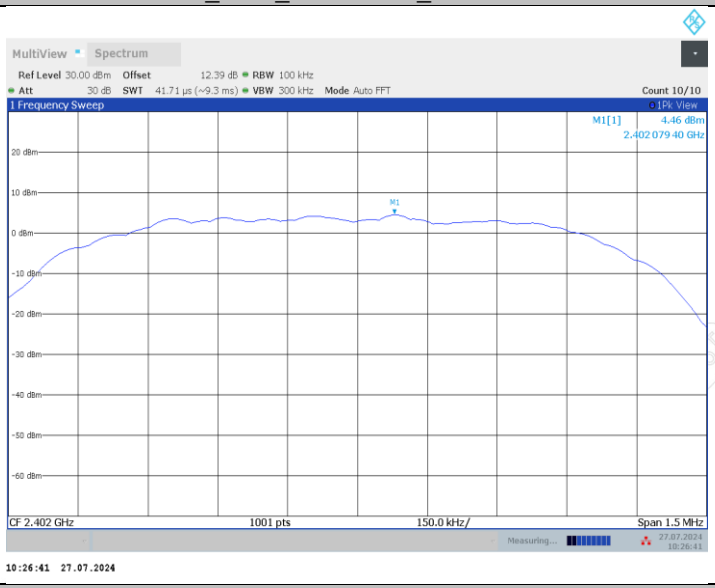
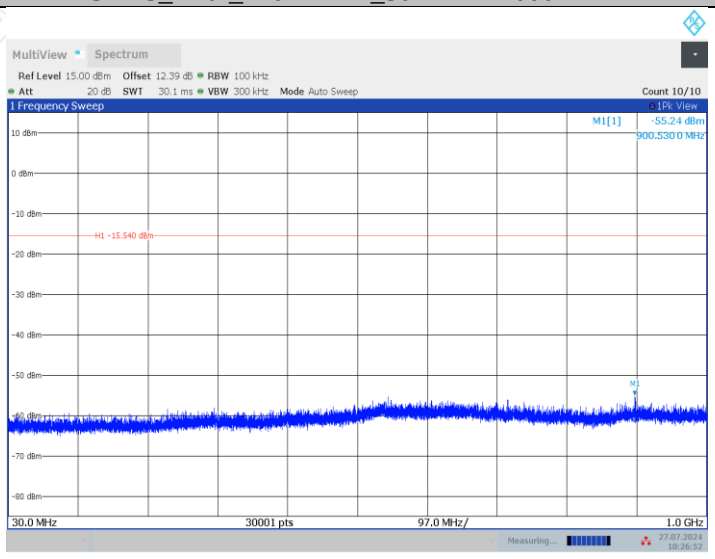
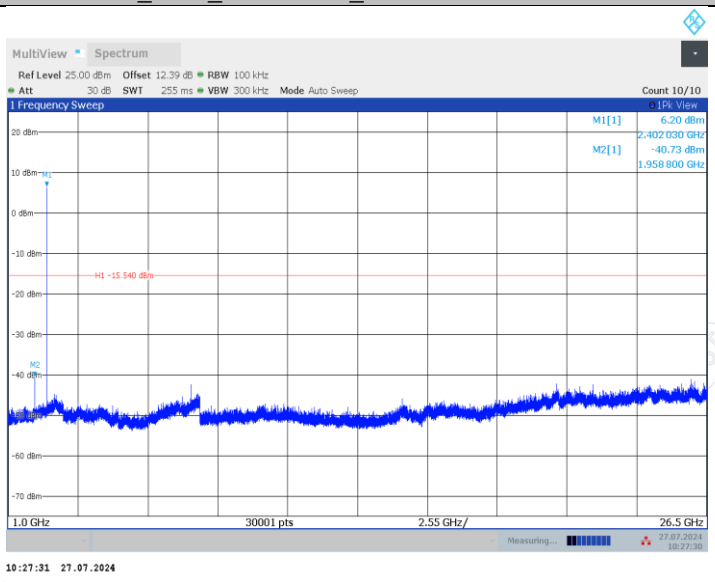
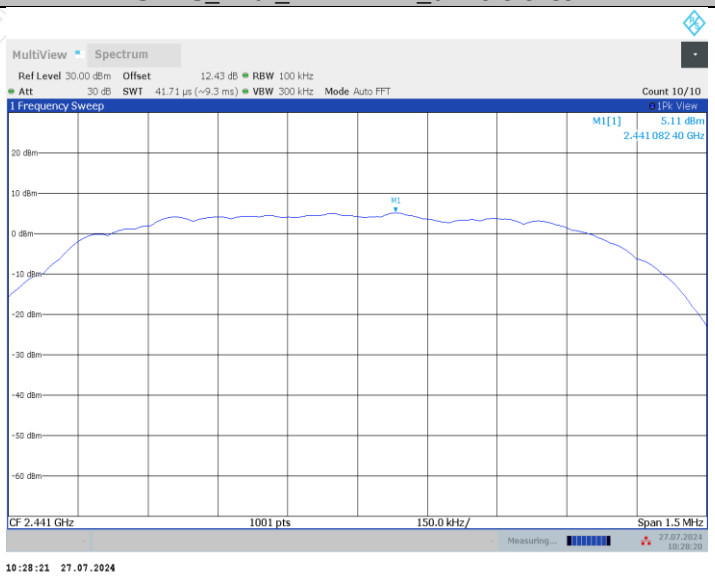
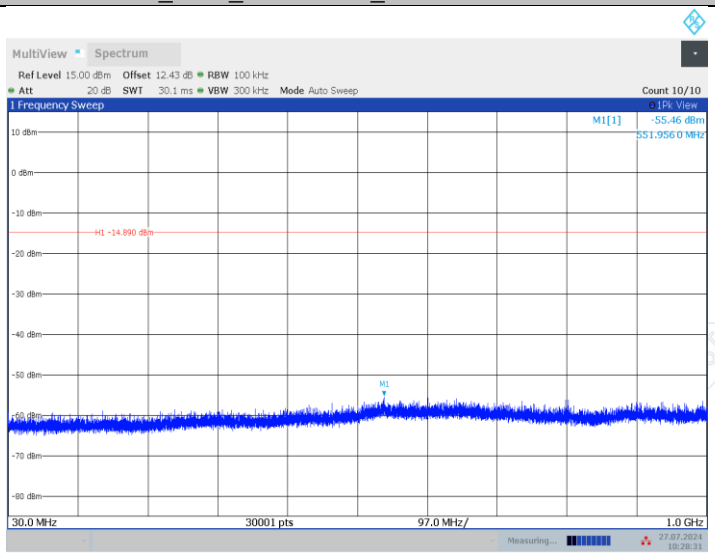
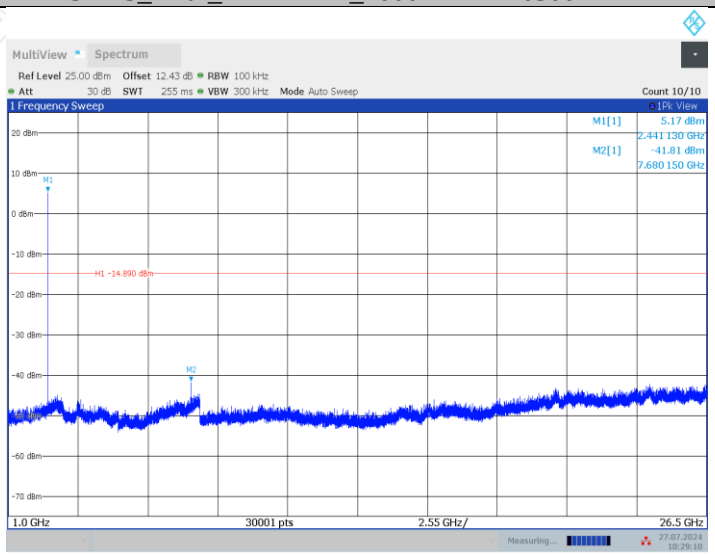
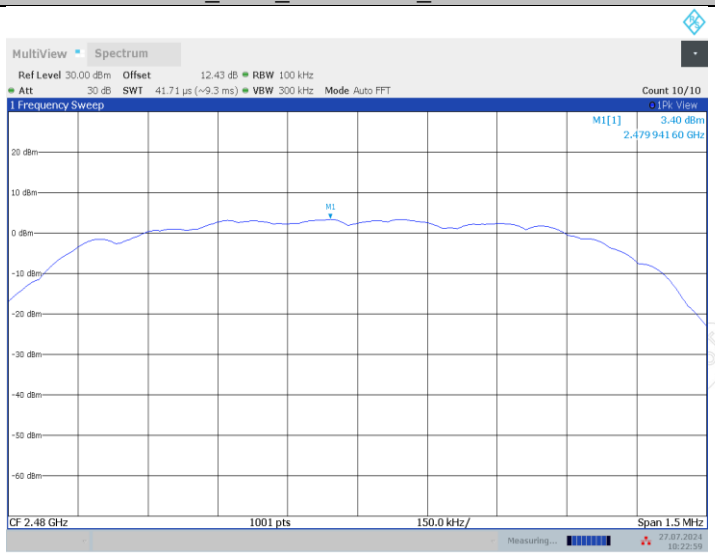
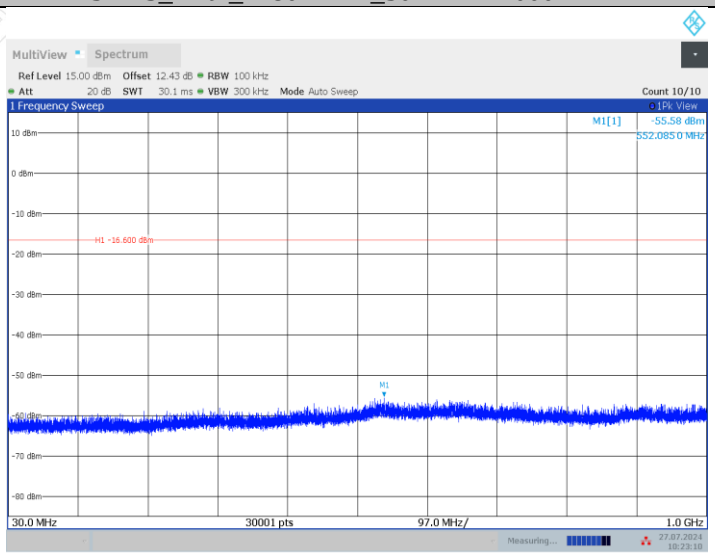
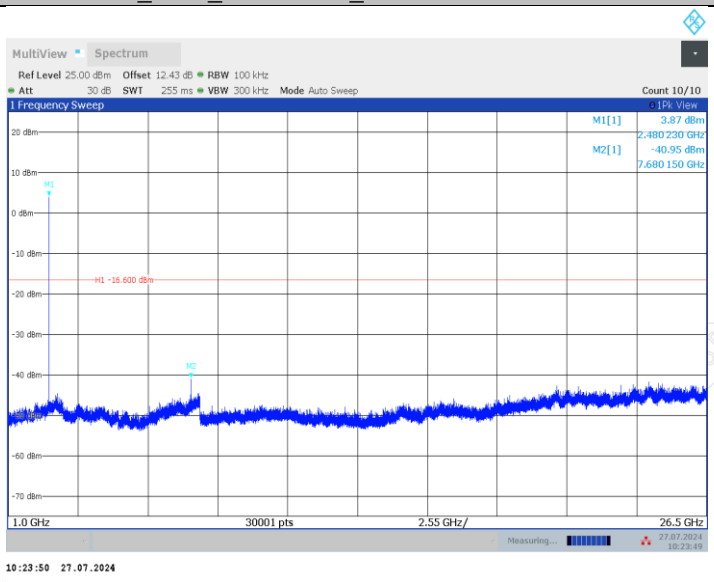
 10:41:00 27.07.2024

3DH5_Ant1_2402 MHz _0~Reference
 10:26:41 27.07.2024
3DH5_Ant1_2402 MHz _30 MHz ~1000 MHz
 10:26:52 27.07.2024

3DH5_Ant1_2402 MHz _1000 MHz ~26500 MHz

3DH5_Ant1_2441 MHz _0~Reference


3DH5_Ant1_2441 MHz _30 MHz ~1000 MHz

3DH5_Ant1_2441 MHz _1000 MHz ~26500 MHz


3DH5_Ant1_2480 MHz _0~Reference

3DH5_Ant1_2480 MHz _30 MHz ~1000 MHz


3DH5_Ant1_2480 MHz _1000 MHz ~26500 MHz


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13. RADIATED SPURIOUS EMISSIONS

13.1 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).

13.2 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.

--- Set the EUT transmit continuously with maximum output power.

--- 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.

--- Set the EUT transmit continuously with maximum output power.

--- 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.

--- Set the EUT transmit continuously with maximum output power.

--- 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.

--- Set the EUT transmit continuously with maximum output power.

--- 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 2.8.

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13.3 TEST SETUP

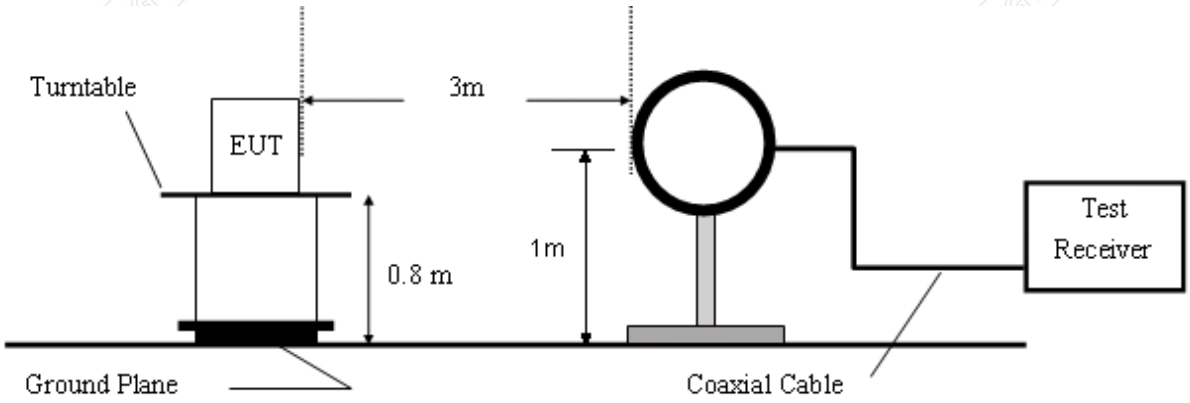

Figure 1. 9kHz to 30MHz radiated emissions test configuration

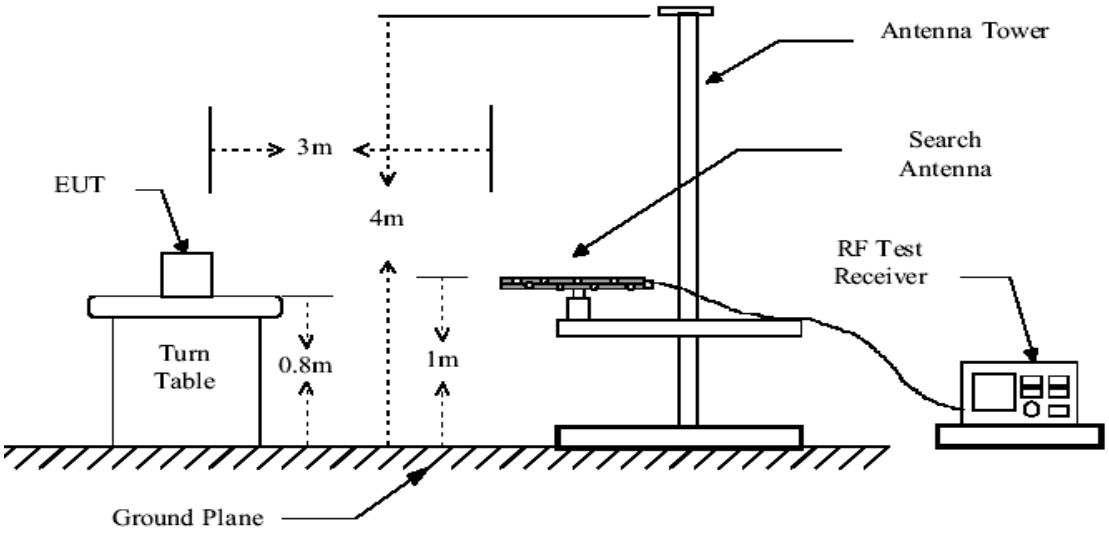

Figure 2. 30MHz to 1GHz radiated emissions test configuration

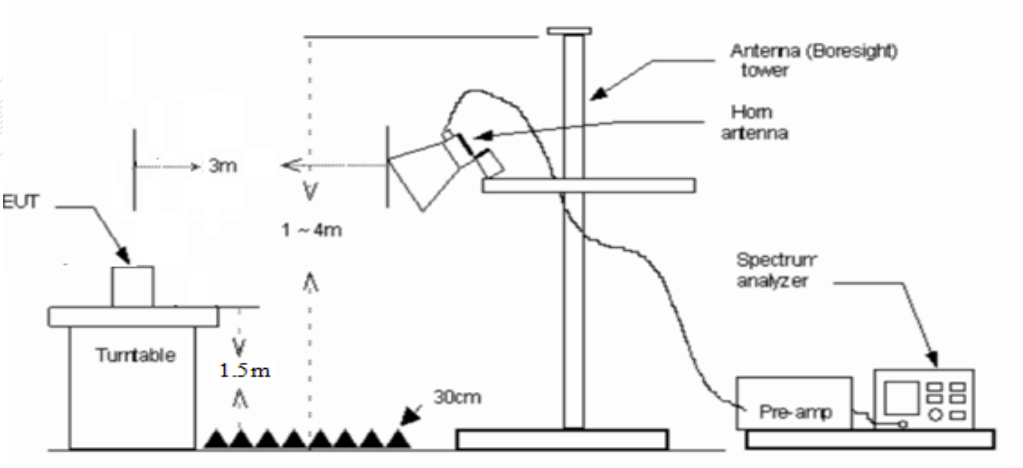

Figure 3. 1GHz to 18GHz radiated emissions test configuration

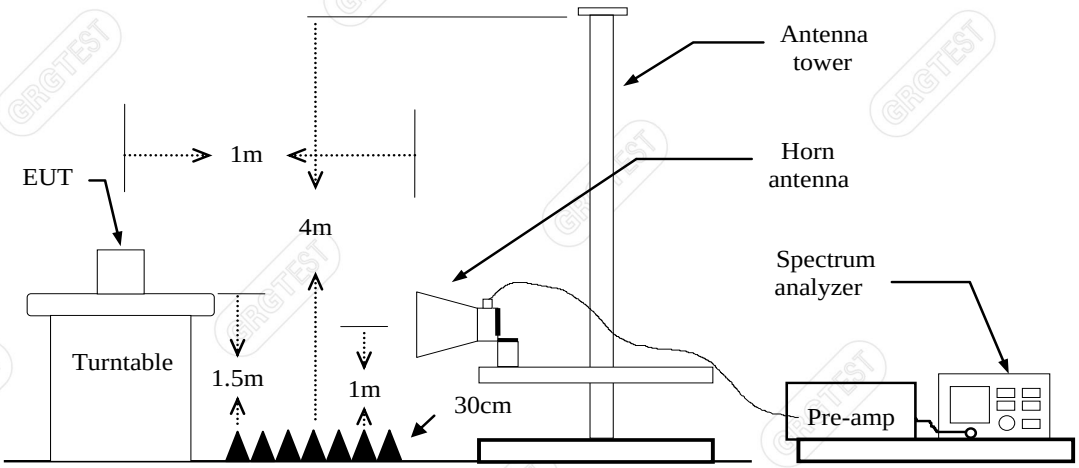

Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

13.4 DATA SAMPLE

30MHz to 1GHz

Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	66.85	31.09	-35.76	40.00	8.91	PK	200	351	Horizontal

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
xxxx	xxxx	-31.57	71.28	39.71	46.00	6.29	100	196	Horizontal

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV/m) = Uncorrected Analyzer / Receiver reading
Factor (dB) = Antenna factor + Cable loss – Amplifier gain
Level (dBuV/m) = Reading (dBuV/m) + Factor (dB)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Limit (dBuV/m) – Level (dBuV/m)
Polarity = Antenna polarization
Peak = Peak Reading
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 [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	54.49	42.38	-12.11	83.54	41.16	100	211	Vertical	Peak
xxx	xxxx	43.99	31.88	-12.11	63.54	31.66	100	211	Vertical	AVG

Frequency (MHz) = Emission frequency in MHz

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

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

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

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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13.5 TEST RESULTS

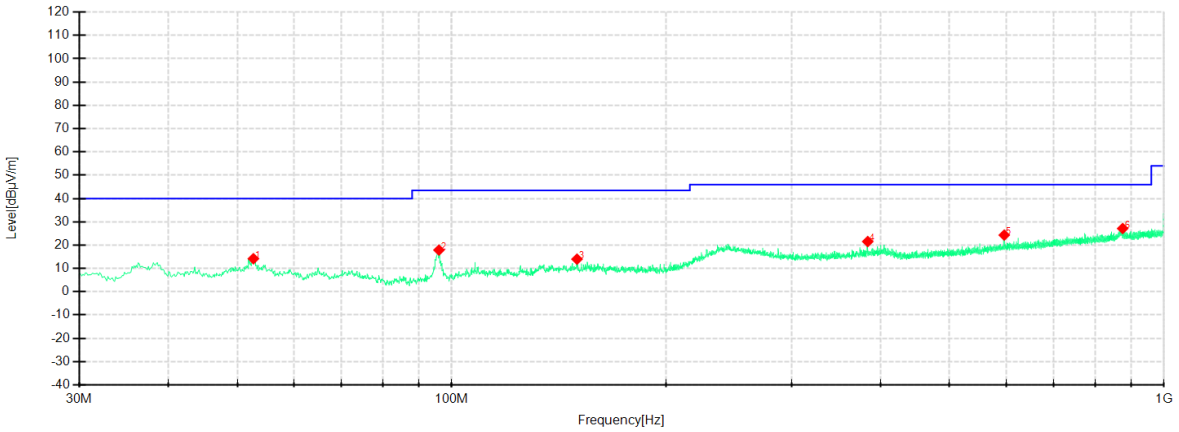
Below 1GHz

All models were pretested and only the worst modes and channels were recorded in this report (3DH5-2441MHz).

The chart below shows the highest readings taken from the final data.

Mode: 3DH5
Middle Frequency (2441MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting Probe : Horizontal

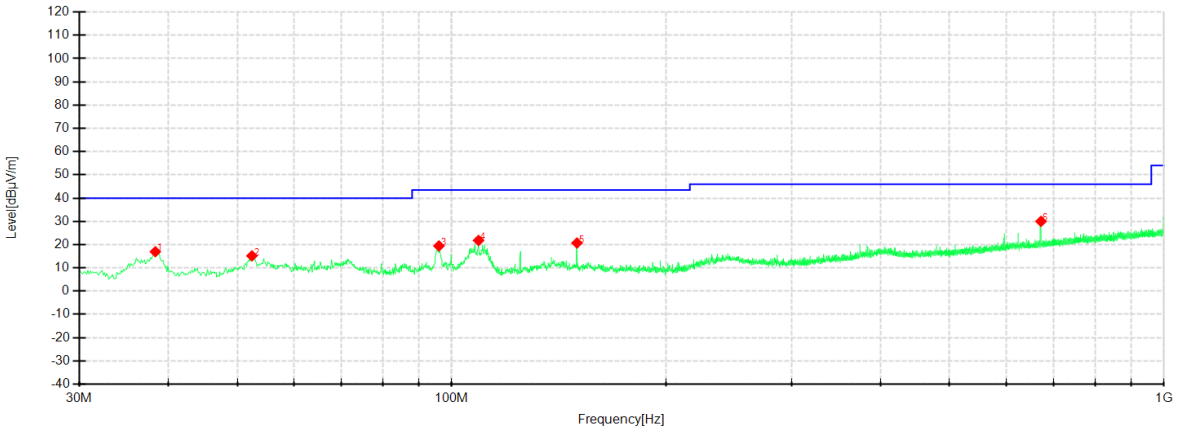
Test Graph



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	52.6766	43.20	14.18	-29.02	40.00	25.82	PK	100	211	Horizontal
2	95.9682	50.55	17.88	-32.67	43.50	25.62	PK	100	122	Horizontal
3	149.9312	42.14	13.98	-28.16	43.50	29.52	PK	100	136	Horizontal
4	383.8517	46.03	21.54	-24.49	46.00	24.46	PK	100	325	Horizontal
5	596.6721	43.49	24.31	-19.18	46.00	21.69	PK	200	238	Horizontal
6	874.9756	42.90	27.14	-15.76	46.00	18.86	PK	200	301	Horizontal

Mode: 3DH5
Middle Frequency (2441MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting Probe : Vertical

Test Graph



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	38.3673	46.37	16.96	-29.41	40.00	23.04	PK	100	173	Vertical
2	52.4341	44.18	15.18	-29.00	40.00	24.82	PK	100	262	Vertical
3	95.9682	52.12	19.45	-32.67	43.50	24.05	PK	100	8	Vertical
4	109.0649	52.49	21.79	-30.70	43.50	21.71	PK	100	327	Vertical
5	149.9312	48.86	20.70	-28.16	43.50	22.80	PK	100	200	Vertical
6	671.8565	48.42	30.00	-18.42	46.00	16.00	PK	200	359	Vertical

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-Middle Channel(3DH5))
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 Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
6 The IF bandwidth of SPA between 30MHz to 1GHz was 120kHz.

1GHz to 18GHz

Mode: DH5
Lowest Frequency (2402MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1906.6000	47.03	43.41	-3.62	74.00	30.59	200	250	Horizontal
2	2306.0000	50.92	47.16	-3.76	74.00	26.84	100	246	Horizontal
3	2497.8000	52.14	51.75	-0.39	74.00	22.25	100	234	Horizontal
4	3361.5000	51.50	38.40	-13.10	74.00	35.60	200	124	Horizontal
5	4125.0000	50.27	40.03	-10.24	74.00	33.97	100	59	Horizontal
6	14137.5000	39.00	52.20	13.20	74.00	21.80	200	20	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	2497.8000	-0.39	37.48	37.09	54.00	16.91	100	234	Horizontal
2	14137.5000	13.20	29.25	42.45	54.00	11.55	200	20	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	2386.0000	50.45	47.55	-2.90	74.00	26.45	100	274	Vertical
2	2498.0000	49.05	48.63	-0.42	74.00	25.37	100	57	Vertical
3	2551.6000	49.47	47.02	-2.45	74.00	26.98	100	300	Vertical
4	5106.0000	47.63	41.53	-6.10	74.00	32.47	200	136	Vertical
5	7938.0000	42.29	45.77	3.48	74.00	28.23	200	192	Vertical
6	15042.0000	40.80	53.61	12.81	74.00	20.39	200	285	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	2498.0000	-0.42	37.61	37.19	54.00	16.81	100	57	Vertical
2	15042.0000	12.81	29.53	42.34	54.00	11.66	200	285	Vertical

Mode: DH5
Middle Frequency (2441MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2378.0000	50.70	47.59	-3.11	74.00	26.41	100	103	Horizontal
2	2537.2000	52.30	50.08	-2.22	74.00	23.92	200	260	Horizontal
3	4674.0000	48.78	41.18	-7.60	74.00	32.82	100	125	Horizontal
4	5356.5000	47.88	42.23	-5.65	74.00	31.77	100	34	Horizontal
5	6564.0000	46.34	45.00	-1.34	74.00	29.00	200	101	Horizontal
6	13270.5000	39.30	52.23	12.93	74.00	21.77	100	321	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	2537.2000	-2.22	45.10	42.88	54.00	11.12	200	260	Horizontal
2	13270.5000	12.93	29.38	42.31	54.00	11.69	100	321	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	2380.8000	50.54	47.54	-3.00	74.00	26.46	100	340	Vertical
2	2552.8000	49.49	47.05	-2.44	74.00	26.95	100	300	Vertical
3	3996.0000	49.17	39.01	-10.16	74.00	34.99	100	21	Vertical
4	5484.0000	47.18	42.06	-5.12	74.00	31.94	100	356	Vertical
5	7455.0000	43.38	45.14	1.76	74.00	28.86	200	242	Vertical
6	14698.5000	41.13	53.67	12.54	74.00	20.33	200	332	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	14698.5000	12.54	30.15	42.69	54.00	11.31	200	332	Vertical

Mode: DH5
Highest Frequency (2480MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1912.0000	47.77	44.11	-3.66	74.00	29.89	100	50	Horizontal
2	2384.2000	50.05	47.13	-2.92	74.00	26.87	100	261	Horizontal
3	2517.4000	48.92	47.69	-1.23	74.00	26.31	100	248	Horizontal
4	5911.5000	46.02	42.30	-3.72	74.00	31.70	200	360	Horizontal
5	9237.0000	41.55	48.89	7.34	74.00	25.11	100	175	Horizontal
6	15762.0000	42.89	52.48	9.59	74.00	21.52	100	95	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	9237.0000	7.34	33.58	40.92	54.00	13.08	100	175	Horizontal
2	15762.0000	9.59	33.04	42.63	54.00	11.37	100	95	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	2343.8000	51.56	47.96	-3.60	74.00	26.04	200	314	Vertical
2	2575.8000	49.88	47.51	-2.37	74.00	26.49	100	301	Vertical
3	2629.6000	48.81	46.51	-2.30	74.00	27.49	200	93	Vertical
4	7189.5000	43.69	44.87	1.18	74.00	29.13	100	138	Vertical
5	8977.5000	41.09	46.77	5.68	74.00	27.23	200	177	Vertical
6	15237.0000	40.36	52.05	11.69	74.00	21.95	100	46	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	15237.0000	11.69	30.63	42.32	54.00	11.68	100	46	Vertical

Mode: 2DH5
Lowest Frequency (2402MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1965.0000	47.49	43.60	-3.89	74.00	30.40	100	258	Horizontal
2	2498.0000	50.66	50.27	-0.39	74.00	23.73	200	250	Horizontal
3	2551.4000	50.83	47.99	-2.84	74.00	26.01	200	250	Horizontal
4	4803.0000	49.65	42.51	-7.14	74.00	31.49	200	309	Horizontal
5	6739.5000	45.03	44.51	-0.52	74.00	29.49	100	58	Horizontal
6	15673.5000	43.48	53.42	9.94	74.00	20.58	100	122	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	2498.0000	-0.39	37.53	37.14	54.00	16.86	200	250	Horizontal
2	15673.5000	9.94	32.27	42.21	54.00	11.79	100	122	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	1749.6000	49.22	42.77	-6.45	74.00	31.23	200	0	Vertical
2	2383.8000	50.16	47.22	-2.94	74.00	26.78	100	195	Vertical
3	2514.2000	48.93	47.97	-0.96	74.00	26.03	100	300	Vertical
4	5488.5000	47.20	42.08	-5.12	74.00	31.92	200	338	Vertical
5	11797.5000	40.63	51.71	11.08	74.00	22.29	100	21	Vertical
6	15126.0000	40.15	52.54	12.39	74.00	21.46	200	219	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	11797.5000	11.08	31.08	42.16	54.00	11.84	100	21	Vertical
2	15126.0000	12.39	30.21	42.60	54.00	11.40	200	219	Vertical

Mode: 2DH5
Middle Frequency (2441MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1895.8000	47.38	43.68	-3.70	74.00	30.32	200	46	Horizontal
2	2537.0000	50.58	48.37	-2.21	74.00	25.63	200	242	Horizontal
3	2916.4000	47.08	46.02	-1.06	74.00	27.98	200	97	Horizontal
4	4683.0000	48.24	40.82	-7.42	74.00	33.18	200	340	Horizontal
5	8016.0000	42.42	45.47	3.05	74.00	28.53	100	13	Horizontal
6	14572.5000	39.21	52.00	12.79	74.00	22.00	100	155	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	2537.0000	-2.21	45.43	43.22	54.00	10.78	200	242	Horizontal
2	14572.5000	12.79	29.72	42.51	54.00	11.49	100	155	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	1919.2000	47.52	43.68	-3.84	74.00	30.32	100	138	Vertical
2	2515.4000	47.67	46.66	-1.01	74.00	27.34	100	295	Vertical
3	2820.2000	47.12	46.10	-1.02	74.00	27.90	100	150	Vertical
4	5812.5000	46.65	42.49	-4.16	74.00	31.51	100	105	Vertical
5	6720.0000	44.65	44.39	-0.26	74.00	29.61	100	40	Vertical
6	15667.5000	42.54	52.62	10.08	74.00	21.38	100	80	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	15667.5000	10.08	32.85	42.93	54.00	11.07	100	80	Vertical

Mode: 2DH5
Highest Frequency (2480MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2374.0000	50.08	46.84	-3.24	74.00	27.16	100	215	Horizontal
2	2498.0000	50.37	49.98	-0.39	74.00	24.02	200	118	Horizontal
3	2551.4000	51.46	48.62	-2.84	74.00	25.38	200	250	Horizontal
4	4959.0000	48.26	41.70	-6.56	74.00	32.30	200	235	Horizontal
5	11826.0000	39.61	50.57	10.96	74.00	23.43	200	235	Horizontal
6	15744.0000	42.94	52.60	9.66	74.00	21.40	200	247	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	2498.0000	-0.39	36.96	36.57	54.00	17.43	200	118	Horizontal
2	2551.6580	-2.84	46.48	43.64	54.00	10.36	130	252.9	Horizontal
3	11826.0000	10.96	31.71	42.67	54.00	11.33	200	235	Horizontal
4	15744.0000	9.66	32.77	42.43	54.00	11.57	200	247	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	2438.0000	49.74	47.94	-1.80	74.00	26.06	200	94	Vertical
2	2498.0000	49.07	48.65	-0.42	74.00	25.35	100	313	Vertical
3	4960.5000	49.00	42.66	-6.34	74.00	31.34	200	242	Vertical
4	6711.0000	44.77	44.51	-0.26	74.00	29.49	100	122	Vertical
5	10186.5000	40.22	49.52	9.30	74.00	24.48	200	189	Vertical
6	15718.5000	42.62	52.60	9.98	74.00	21.40	100	334	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	2497.9640	-0.42	38.02	37.60	54.00	16.40	100	309.9	Vertical
2	10186.5000	9.30	33.17	42.47	54.00	11.53	200	189	Vertical
3	15718.5000	9.98	32.38	42.36	54.00	11.64	100	334	Vertical

Mode: 3DH5
Lowest Frequency (2402MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2148.8000	47.67	43.86	-3.81	74.00	30.14	100	129	Horizontal
2	2498.0000	51.58	51.19	-0.39	74.00	22.81	200	236	Horizontal
3	2551.2000	50.49	47.65	-2.84	74.00	26.35	100	248	Horizontal
4	5986.5000	46.90	43.13	-3.77	74.00	30.87	100	47	Horizontal
5	10162.5000	40.25	49.84	9.59	74.00	24.16	200	166	Horizontal
6	15697.5000	42.28	52.32	10.04	74.00	21.68	200	152	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	2498.0000	-0.39	37.86	37.47	54.00	16.53	200	236	Horizontal
2	10162.5000	9.59	32.72	42.31	54.00	11.69	200	166	Horizontal
3	15697.5000	10.04	32.56	42.60	54.00	11.40	200	152	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	2075.6000	47.86	43.83	-4.03	74.00	30.17	100	52	Vertical
2	2380.0000	50.67	47.66	-3.01	74.00	26.34	100	132	Vertical
3	2498.0000	48.83	48.41	-0.42	74.00	25.59	200	103	Vertical
4	4959.0000	48.58	42.24	-6.34	74.00	31.76	100	233	Vertical
5	5793.0000	49.56	45.37	-4.19	74.00	28.63	100	288	Vertical
6	15108.0000	40.12	52.37	12.25	74.00	21.63	100	233	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	2498.0000	-0.42	37.86	37.44	54.00	16.56	200	103	Vertical
2	15108.0000	12.25	30.42	42.67	54.00	11.33	100	233	Vertical

Mode: 3DH5
Middle Frequency (2441MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1904.2000	46.93	43.32	-3.61	74.00	30.68	100	230	Horizontal
2	2515.4000	49.92	48.79	-1.13	74.00	25.21	200	244	Horizontal
3	2590.6000	49.39	46.82	-2.57	74.00	27.18	100	244	Horizontal
4	4414.5000	49.63	40.82	-8.81	74.00	33.18	200	234	Horizontal
5	8122.5000	43.07	46.06	2.99	74.00	27.94	200	301	Horizontal
6	14628.0000	39.93	52.28	12.35	74.00	21.72	100	40	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	2515.4000	-1.13	44.64	43.51	54.00	10.49	200	244	Horizontal
2	14628.0000	12.35	29.85	42.20	54.00	11.80	100	40	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	1911.6000	48.04	44.27	-3.77	74.00	29.73	100	319	Vertical
2	2516.0000	48.48	47.44	-1.04	74.00	26.56	200	102	Vertical
3	2914.2000	47.50	46.24	-1.26	74.00	27.76	200	33	Vertical
4	4929.0000	47.75	41.22	-6.53	74.00	32.78	100	328	Vertical
5	10131.0000	40.94	50.27	9.33	74.00	23.73	100	341	Vertical
6	15217.5000	40.53	52.29	11.76	74.00	21.71	100	27	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	10131.0000	9.33	33.84	43.17	54.00	10.83	100	341	Vertical
2	15217.5000	11.76	30.93	42.69	54.00	11.31	100	27	Vertical

Mode: 3DH5
Highest Frequency (2480MHz) Date: 2024-08-11
Environment: 26.5℃/60%RH/101.0kPa Test Voltage: DC 12V
Test Engineer: Qin Tingting

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2012.2000	47.25	43.24	-4.01	74.00	30.76	200	168	Horizontal
2	2343.6000	51.84	47.88	-3.96	74.00	26.12	100	312	Horizontal
3	2497.8000	51.23	50.84	-0.39	74.00	23.16	100	234	Horizontal
4	4959.0000	49.42	42.86	-6.56	74.00	31.14	200	139	Horizontal
5	10186.5000	40.44	49.90	9.46	74.00	24.10	100	350	Horizontal
6	15777.0000	42.79	52.35	9.56	74.00	21.65	100	359	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	2497.8000	-0.39	37.63	37.24	54.00	16.76	100	234	Horizontal
2	10186.5000	9.46	33.45	42.91	54.00	11.09	100	350	Horizontal
3	15777.0000	9.56	32.85	42.41	54.00	11.59	100	359	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	1917.2000	46.99	43.17	-3.82	74.00	30.83	200	298	Vertical
2	2497.4000	48.84	48.41	-0.43	74.00	25.59	200	116	Vertical
3	2813.0000	47.17	46.16	-1.01	74.00	27.84	200	24	Vertical
4	5976.0000	45.62	42.17	-3.45	74.00	31.83	200	192	Vertical
5	7270.5000	44.28	45.37	1.09	74.00	28.63	200	359	Vertical
6	15691.5000	42.15	52.29	10.14	74.00	21.71	200	48	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	2497.4000	-0.43	38.05	37.62	54.00	16.38	200	116	Vertical
2	15691.5000	10.14	32.62	42.76	54.00	11.24	200	48	Vertical

Remark:

1 Measuring frequencies from 1 GHz to 18GHz 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 2.8.

Test result: The unit does meet the requirements.

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