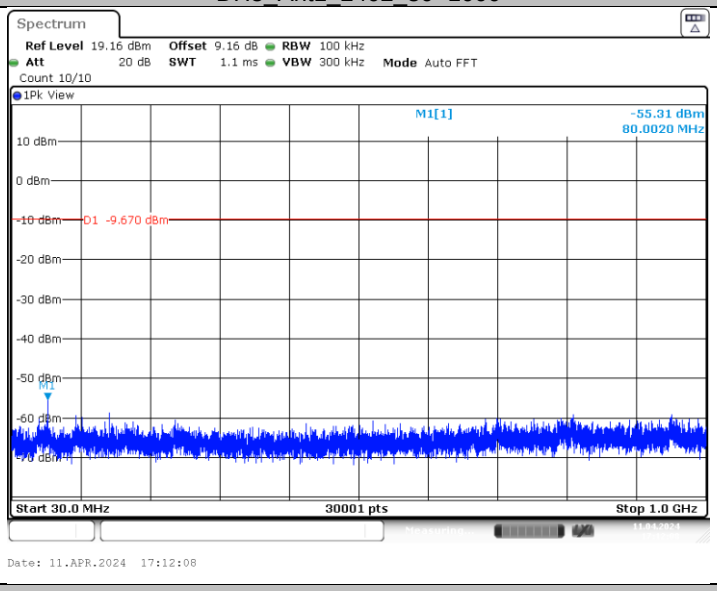
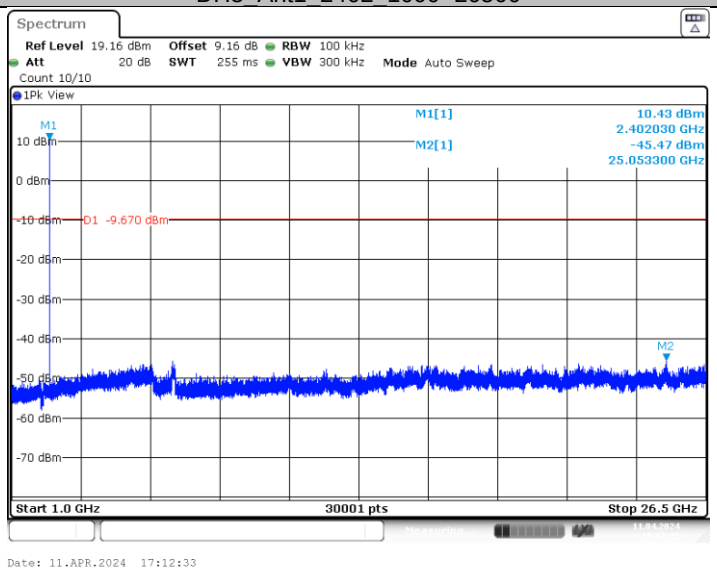
Conducted RF Spurious Emission

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	10.33	-55.31	≤-9.67	PASS
			1000~26500	10.33	-45.47	≤-9.67	PASS
		2441	30~1000	9.87	-56.06	≤-10.13	PASS
			1000~26500	9.87	-44.33	≤-10.13	PASS
		2480	30~1000	5.90	-54.66	≤-14.1	PASS
			1000~26500	5.90	-45.46	≤-14.1	PASS
2DH5	Ant1	2402	30~1000	10.24	-54.96	≤-9.76	PASS
			1000~26500	10.24	-45.61	≤-9.76	PASS
		2441	30~1000	9.79	-55.26	≤-10.21	PASS
			1000~26500	9.79	-44.71	≤-10.21	PASS
		2480	30~1000	4.98	-54.36	≤-15.02	PASS
			1000~26500	4.98	-44.89	≤-15.02	PASS
3DH5	Ant1	2402	30~1000	10.14	-54.27	≤-9.86	PASS
			1000~26500	10.14	-44.09	≤-9.86	PASS
		2441	30~1000	9.49	-55.21	≤-10.51	PASS
			1000~26500	9.49	-45.77	≤-10.51	PASS
		2480	30~1000	4.31	-56.48	≤-15.69	PASS
			1000~26500	4.31	-45.52	≤-15.69	PASS

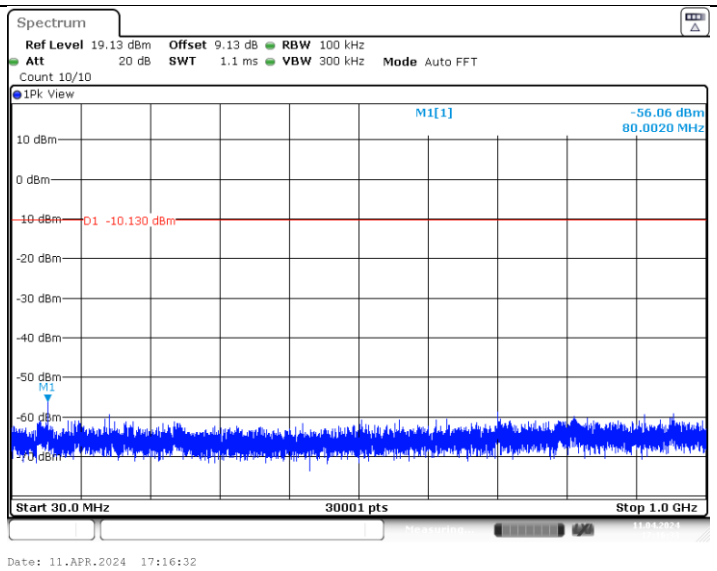
DH5_Ant1_2402_30~1000



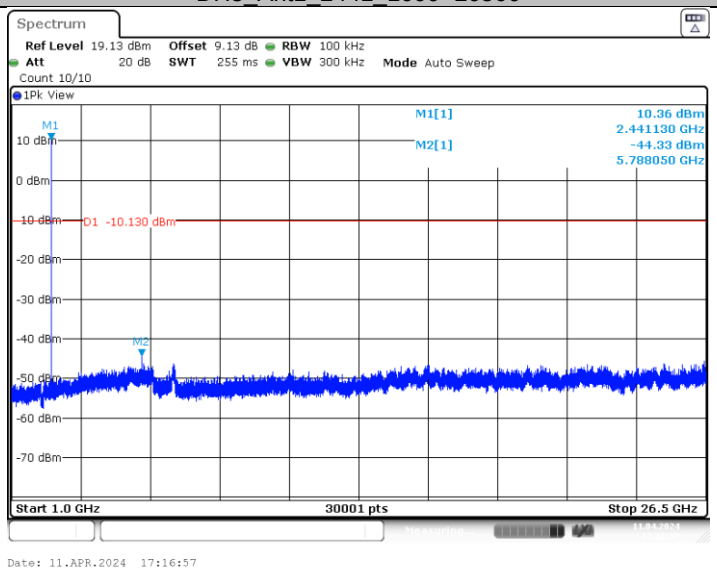
DH5_Ant1_2402_1000~26500



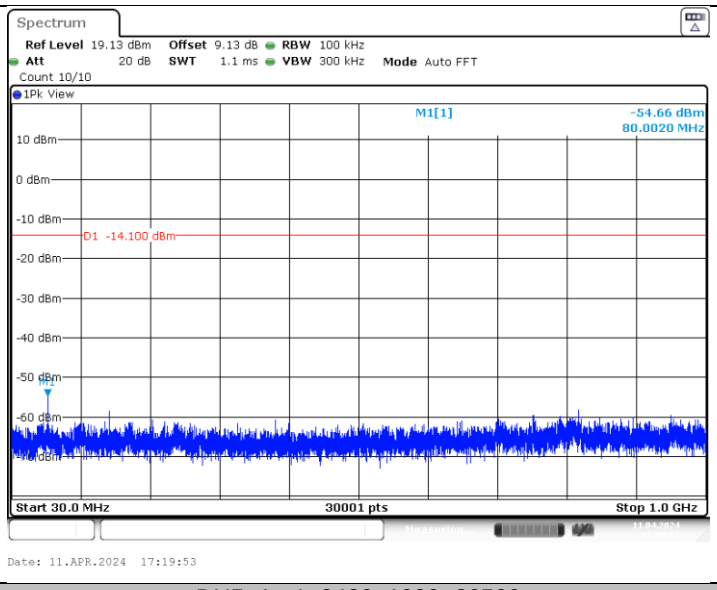
DH5_Ant1_2441_30~1000



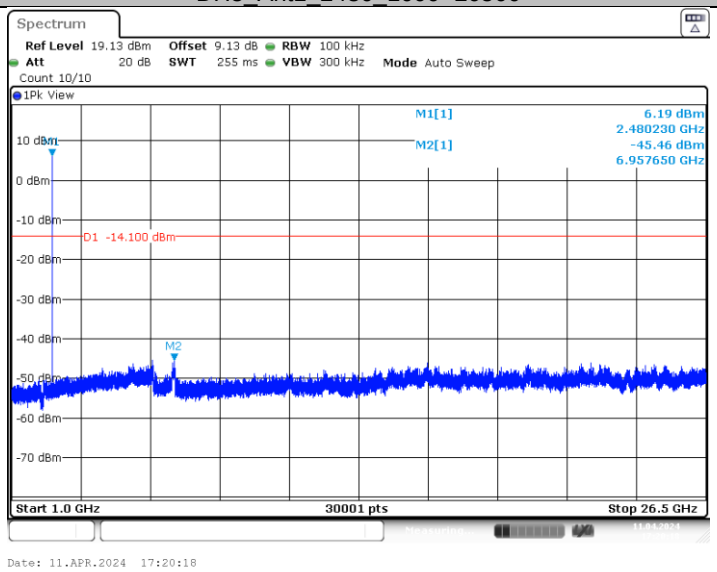
DH5_Ant1_2441_1000~26500



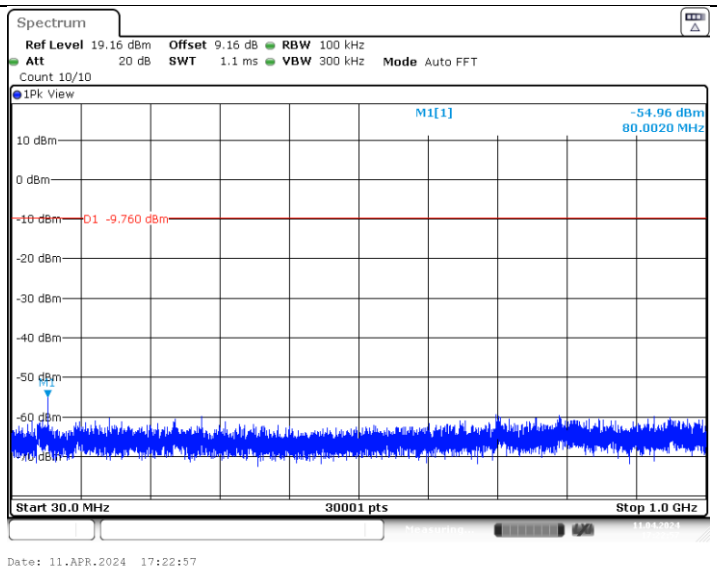
DH5_Ant1_2480_30~1000



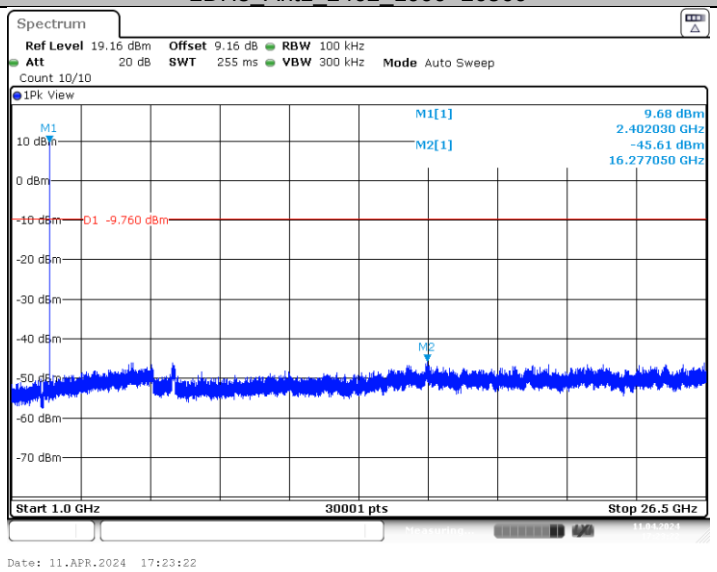
DH5_Ant1_2480_1000~26500



2DH5_Ant1_2402_30~1000



2DH5_Ant1_2402_1000~26500



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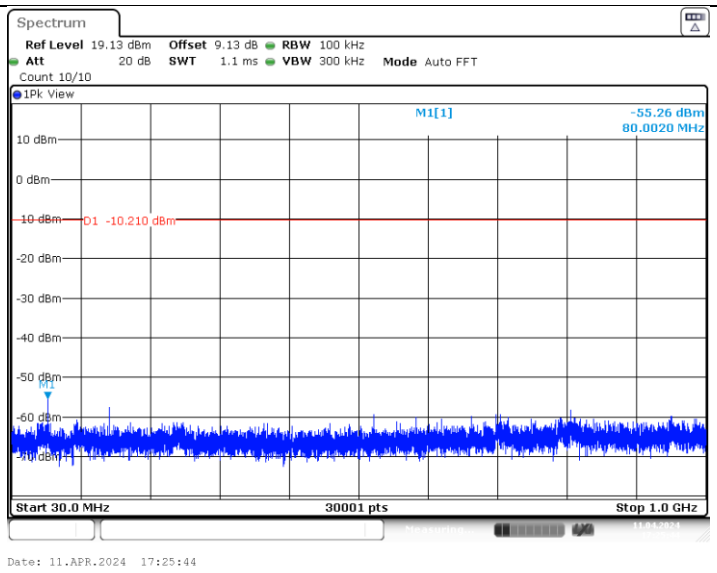

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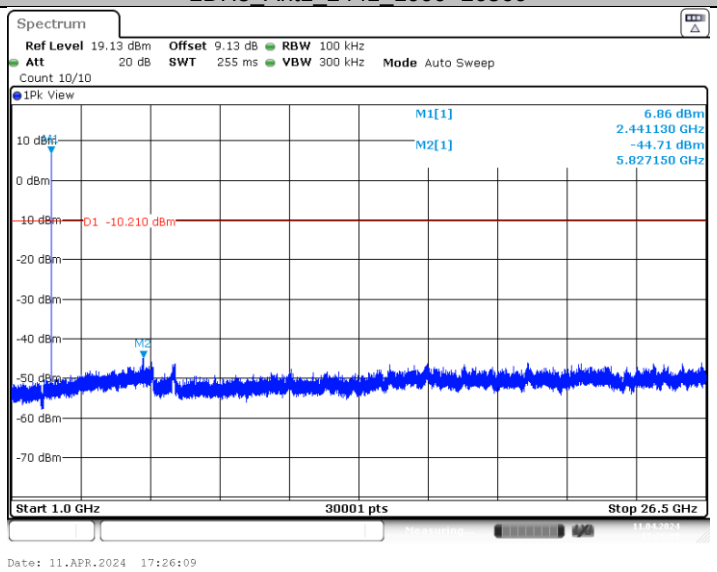
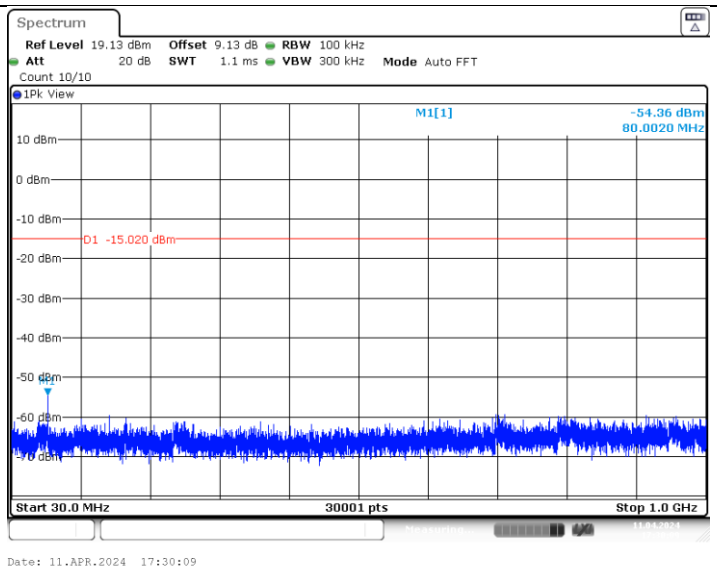
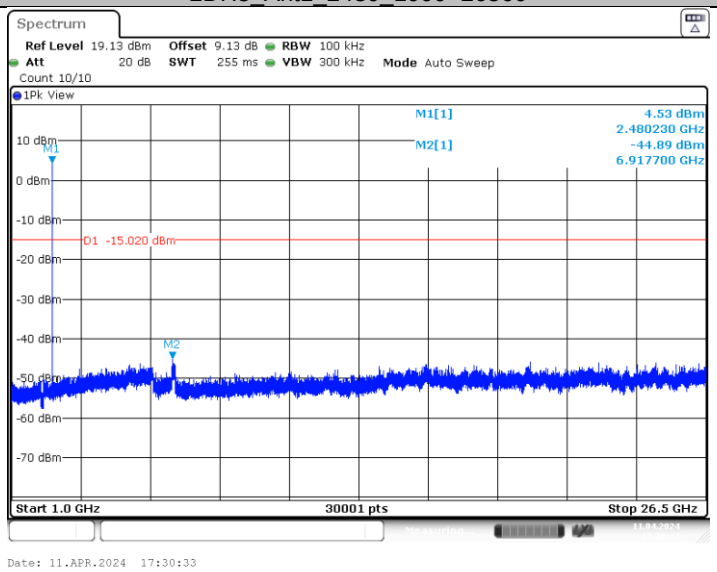


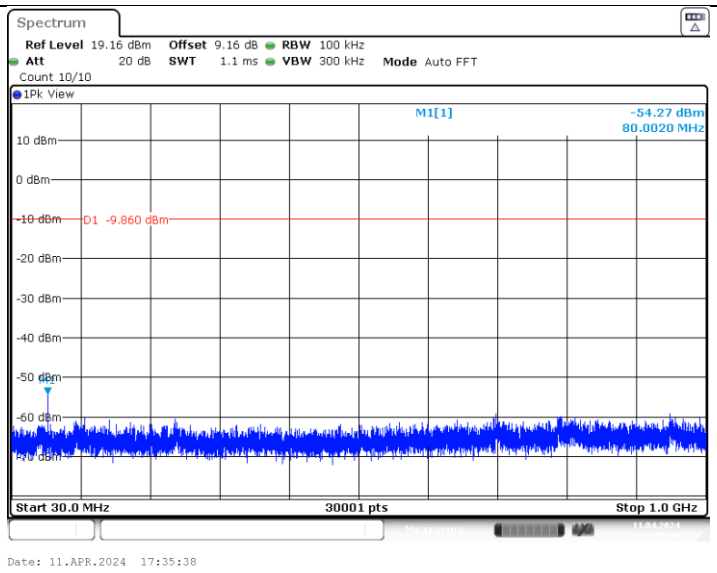
2DH5_Ant1_2480_30~1000



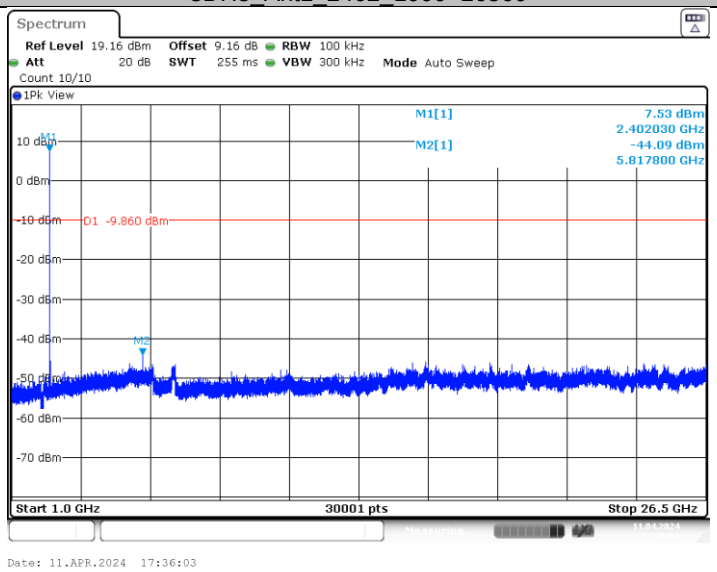
2DH5_Ant1_2480_1000~26500



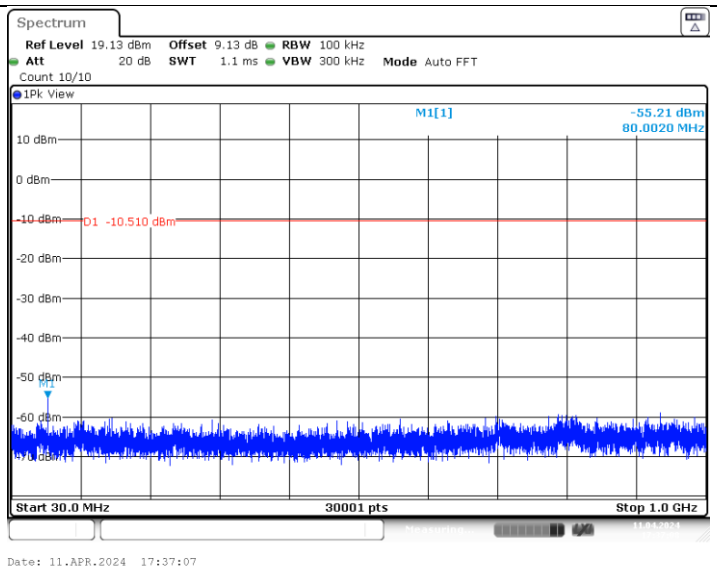
3DH5_Ant1_2402_30~1000



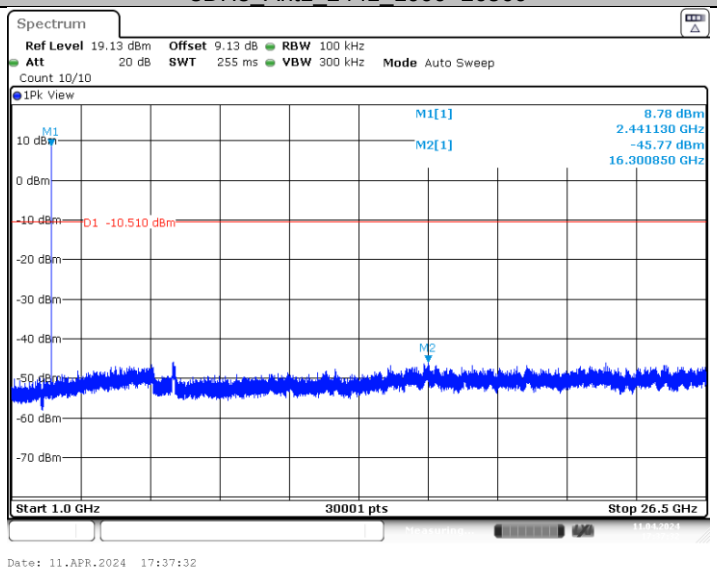
3DH5_Ant1_2402_1000~26500



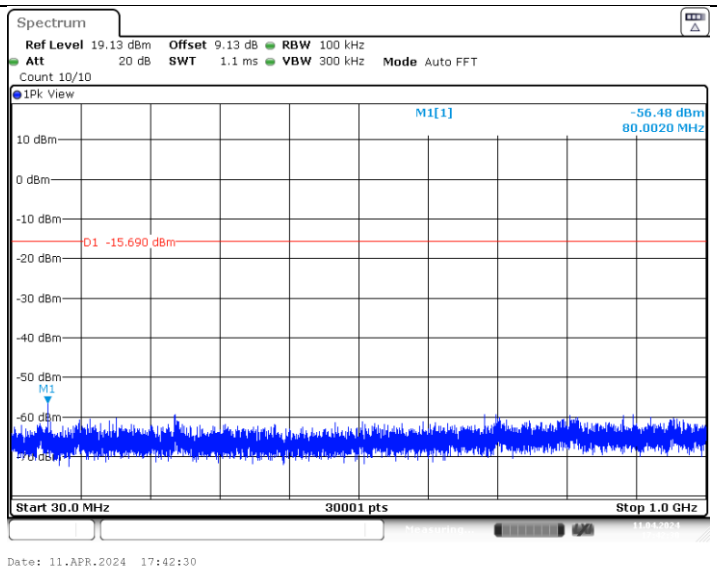
3DH5_Ant1_2441_30~1000



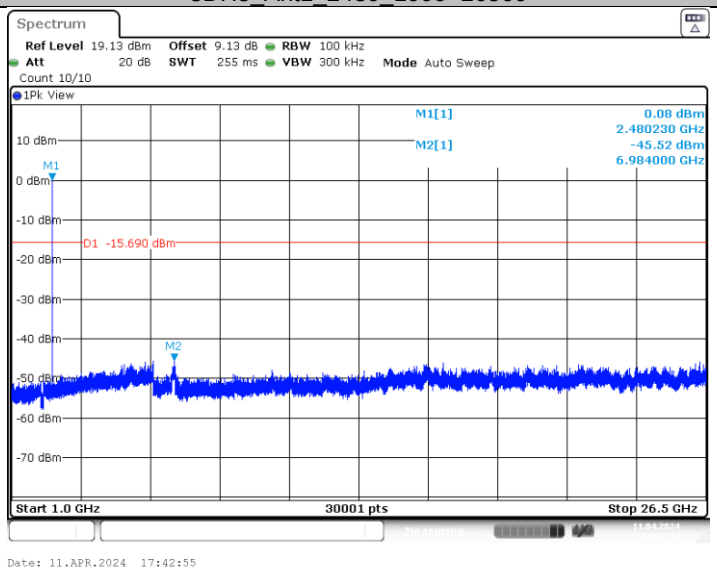
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_30~1000

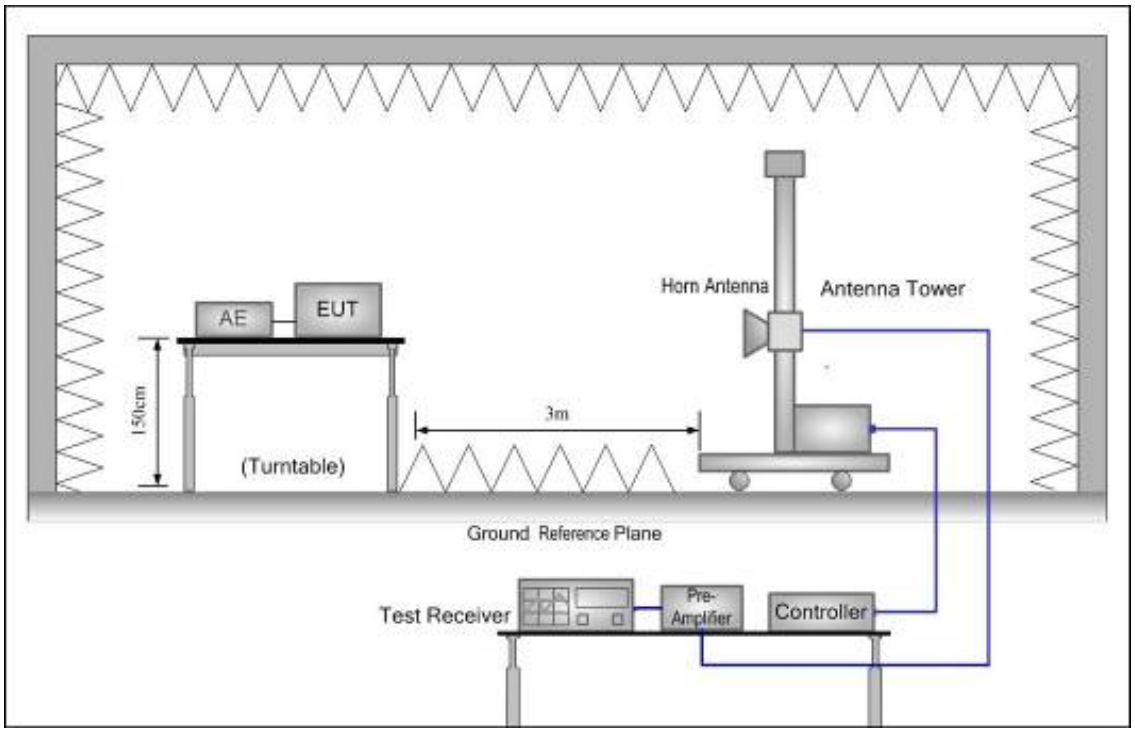


3DH5_Ant1_2480_1000~26500



9. BAND EDGE COMPLIANCE

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested ， only worse case is reported.

9.4. Test Result

PASS. (See below detailed test data)

Test Results					PASS			
Frequency Range					**2310MHz~2410MHz**			
Test Mode					GFSK TX 2402MHz			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	72.85	-21.47	51.38	74.00	-22.62	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	74.89	-26.12	48.77	74.00	-25.23	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	70.35	-21.47	48.88	74.00	-25.12	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	77.18	-26.12	51.06	74.00	-22.94	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				**2450MHz~2550MHz**				
Test Mode				GFSK TX 2480MHz				
1	2483.5	H	77.12	-25.29	51.83	74.00	-22.17	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	72.05	-25.29	46.76	74.00	-27.24	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Test Results					PASS			
Frequency Range					**2310MHz~2410MHz**			
Test Mode					π/4 DQPSK TX 2402MHz			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	70.31	-21.47	48.84	74.00	-25.16	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	76.82	-26.12	50.70	74.00	-23.30	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.59	-21.47	50.12	74.00	-23.88	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	74.28	-26.12	48.16	74.00	-25.84	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				**2450MHz~2550MHz**				
Test Mode				π/4 DQPSK TX 2480MHz				
1	2483.5	H	73.28	-25.29	47.99	74.00	-26.01	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	72.35	-25.29	47.06	74.00	-26.94	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Test Results					PASS			
Frequency Range					**2310MHz~2410MHz**			
Test Mode					8DPSK TX 2402MHz			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	72.41	-21.47	50.94	74.00	-23.06	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	74.20	-26.12	48.08	74.00	-25.92	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	69.17	-21.47	47.70	74.00	-26.30	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	73.07	-26.12	46.95	74.00	-27.05	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				**2450MHz~2550MHz**				
Test Mode				8DPSK TX 2480MHz				
1	2483.5	H	72.53	-25.29	47.24	74.00	-26.76	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	73.01	-25.29	47.72	74.00	-26.28	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Test Results					PASS			
Frequency Range					2310MHz~2410MHz			
Test Mode					GFSK Hopping			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	70.28	-21.47	48.81	74.00	-25.19	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	72.85	-26.12	46.73	74.00	-27.27	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	69.89	-21.47	48.42	74.00	-25.58	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	70.15	-26.12	44.03	74.00	-29.97	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				2450MHz~2550MHz				
Test Mode				GFSK Hopping				
1	2483.5	H	74.02	-25.29	48.73	74.00	-25.27	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	73.85	-25.29	48.56	74.00	-25.44	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.
2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Test Results					PASS			
Frequency Range					**2310MHz~2410MHz**			
Test Mode					π/4 DQPSK Hopping			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	72.12	-21.47	50.65	74.00	-23.35	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	70.83	-26.12	44.71	74.00	-29.29	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.69	-21.47	50.22	74.00	-23.78	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	70.88	-26.12	44.76	74.00	-29.24	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				**2450MHz~2550MHz**				
Test Mode				π/4 DQPSK Hopping				
1	2483.5	H	71.06	-25.29	45.77	74.00	-28.23	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	70.25	-25.29	44.96	74.00	-29.04	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Test Results					PASS			
Frequency Range					**2310MHz~2410MHz**			
Test Mode					8DPSK Hopping			
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	70.53	-21.47	49.06	74.00	-24.94	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	71.38	-26.12	45.26	74.00	-28.74	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	69.85	-21.47	48.38	74.00	-25.62	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	70.08	-26.12	43.96	74.00	-30.04	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results				PASS				
Frequency Range				**2450MHz~2550MHz**				
Test Mode				8DPSK Hopping				
1	2483.5	H	71.65	-25.29	46.36	74.00	-27.64	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	72.14	-25.29	46.85	74.00	-27.15	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

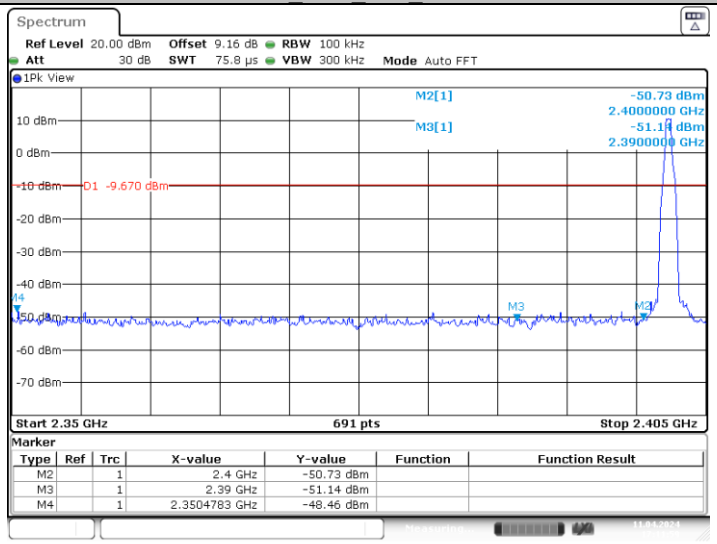
2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Conducted Method

TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	10.33	-48.46	≤-9.67	PASS
		High	2480	5.90	-47.58	≤-14.1	PASS
		Low	Hop_2402	-5.21	-48.52	≤-25.21	PASS
		High	Hop_2480	10.59	-47.65	≤-9.41	PASS
2DH5	Ant1	Low	2402	10.24	-47.69	≤-9.76	PASS
		High	2480	4.98	-47.53	≤-15.02	PASS
		Low	Hop_2402	8.42	-48.31	≤-11.58	PASS
		High	Hop_2480	7.14	-47.62	≤-12.86	PASS
3DH5	Ant1	Low	2402	10.14	-47.26	≤-9.86	PASS
		High	2480	4.31	-47.58	≤-15.69	PASS
		Low	Hop_2402	8.65	-48.32	≤-11.35	PASS
		High	Hop_2480	7.19	-48	≤-12.81	PASS

DH5_Ant1_Low_2402



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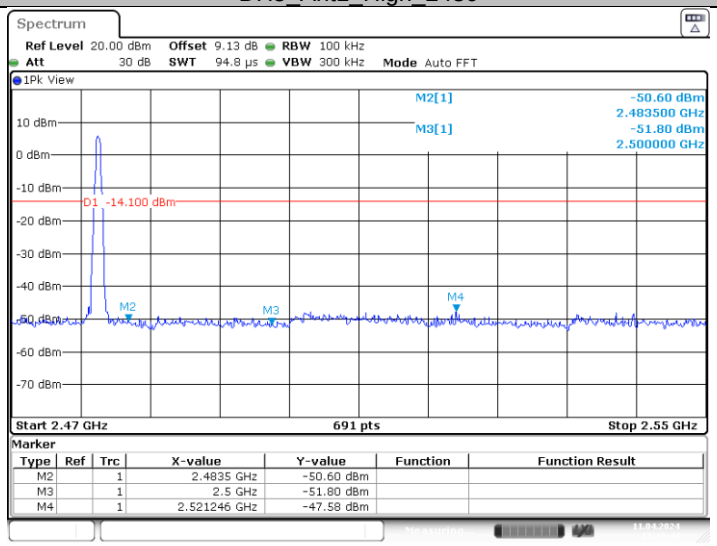
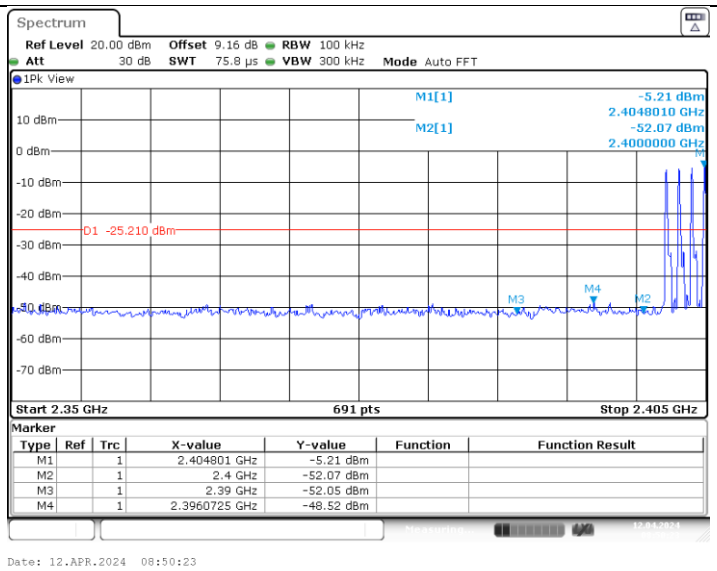
DH5_Ant1_High_2480

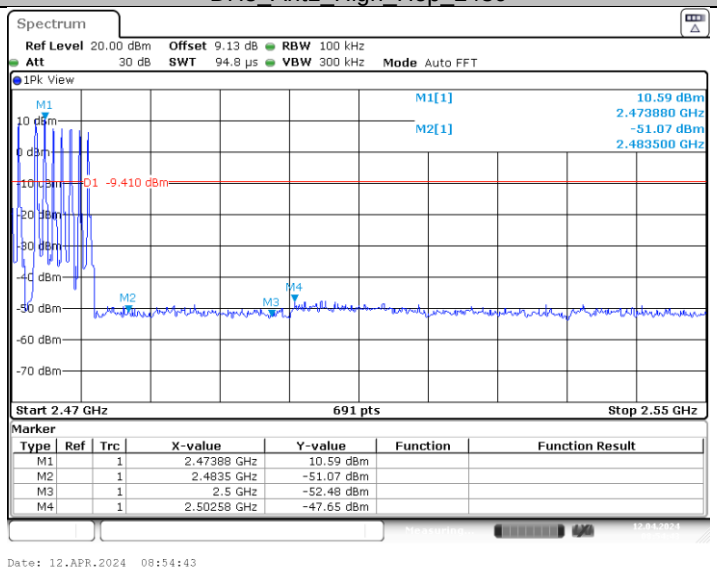


Date: 11.APR.2024 17:19:45

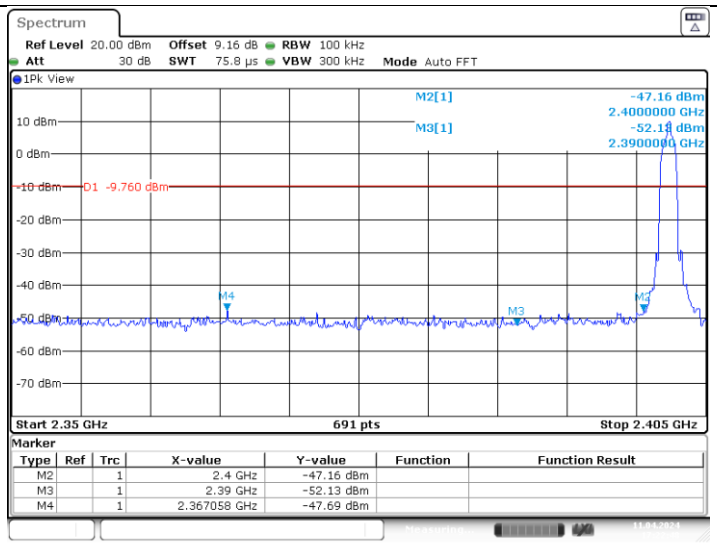
DH5_Ant1_Low_Hop_2402



DH5_Ant1_High_Hop_2480



2DH5_Ant1_Low_2402



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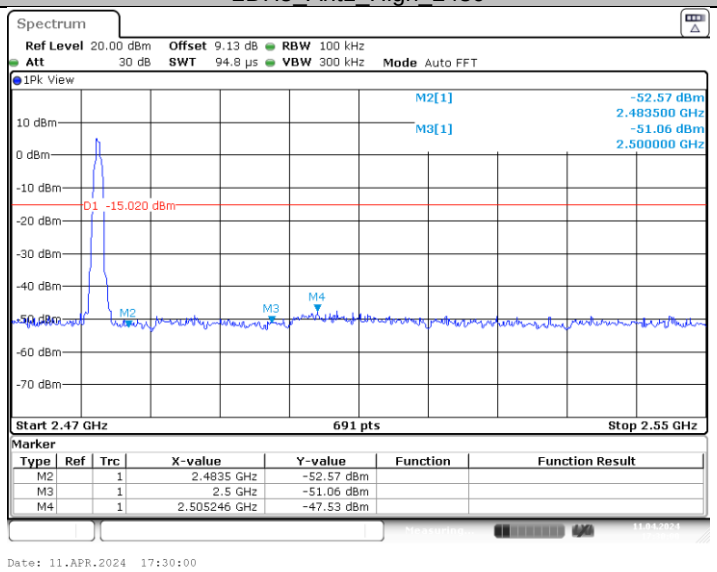

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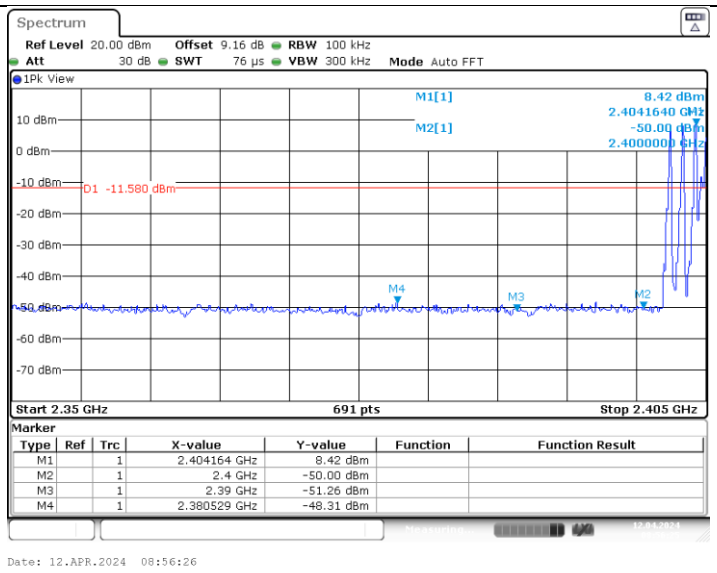

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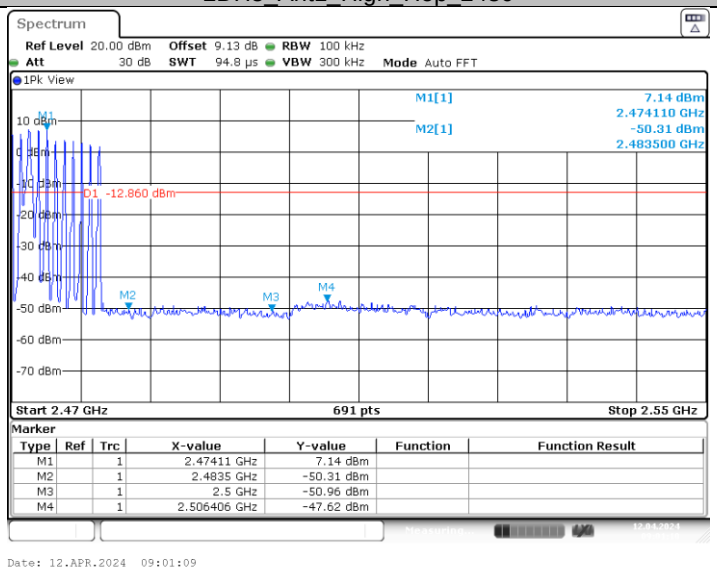

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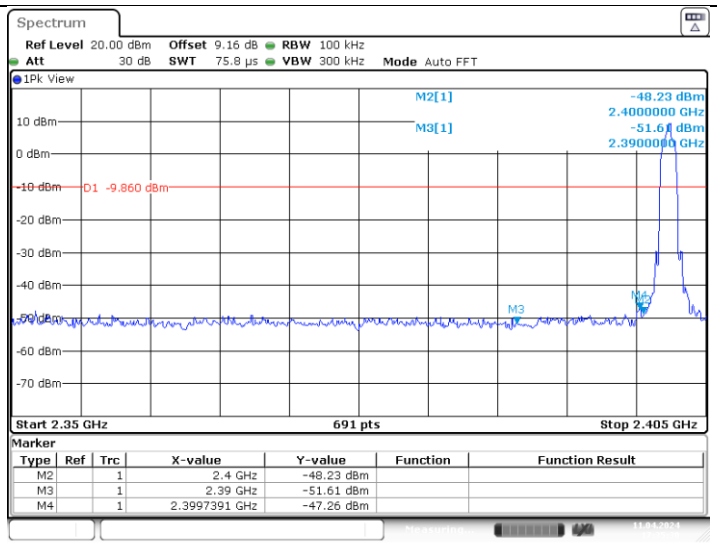

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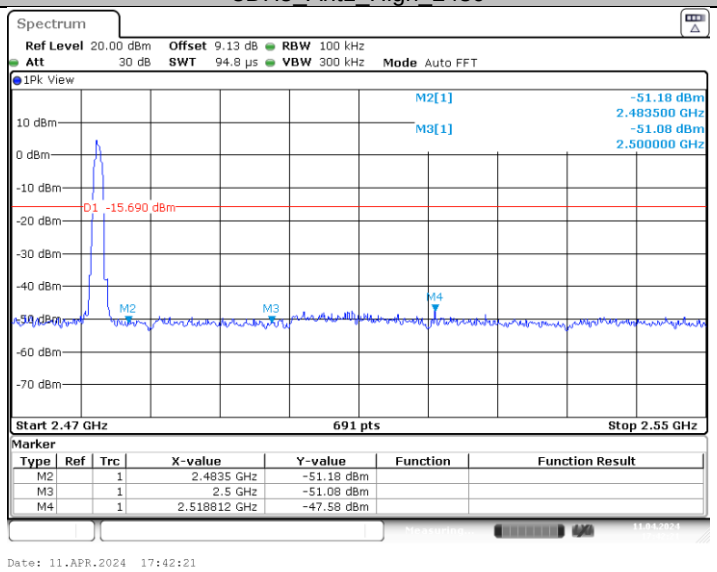

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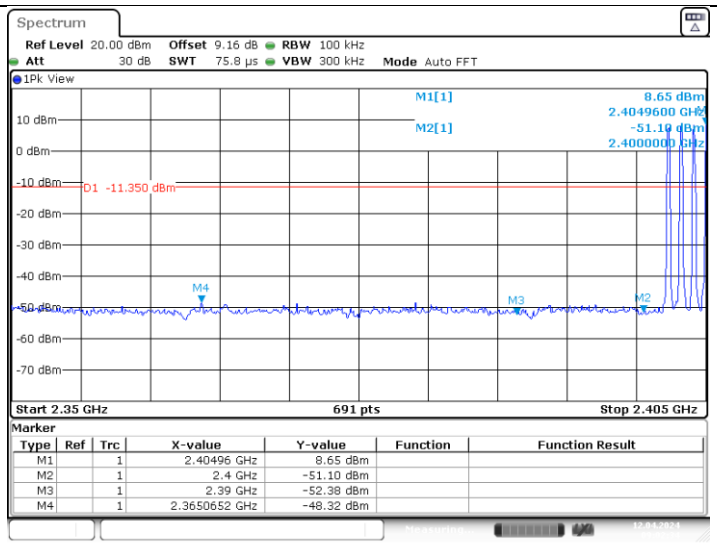

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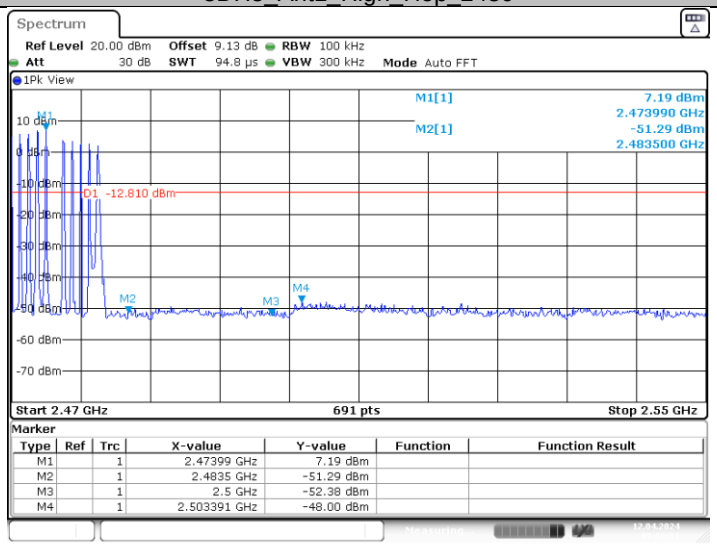
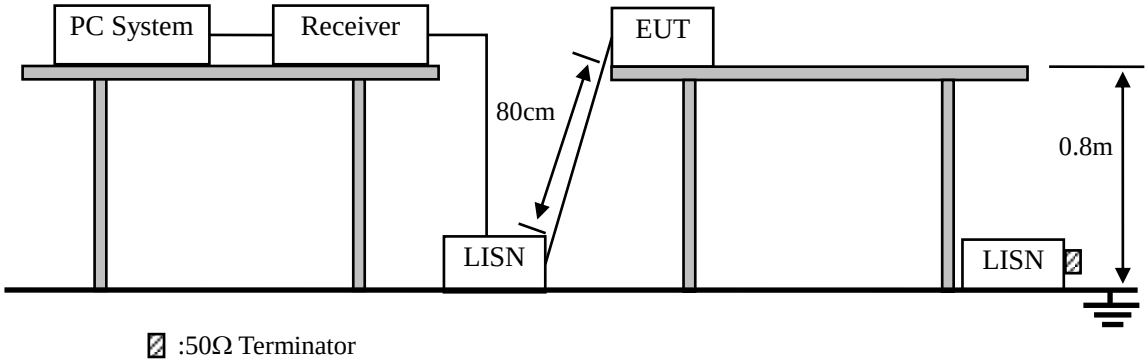


10. POWER LINE CONDUCTED EMISSIONS

10.1.Block Diagram of Test Setup



10.2.Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

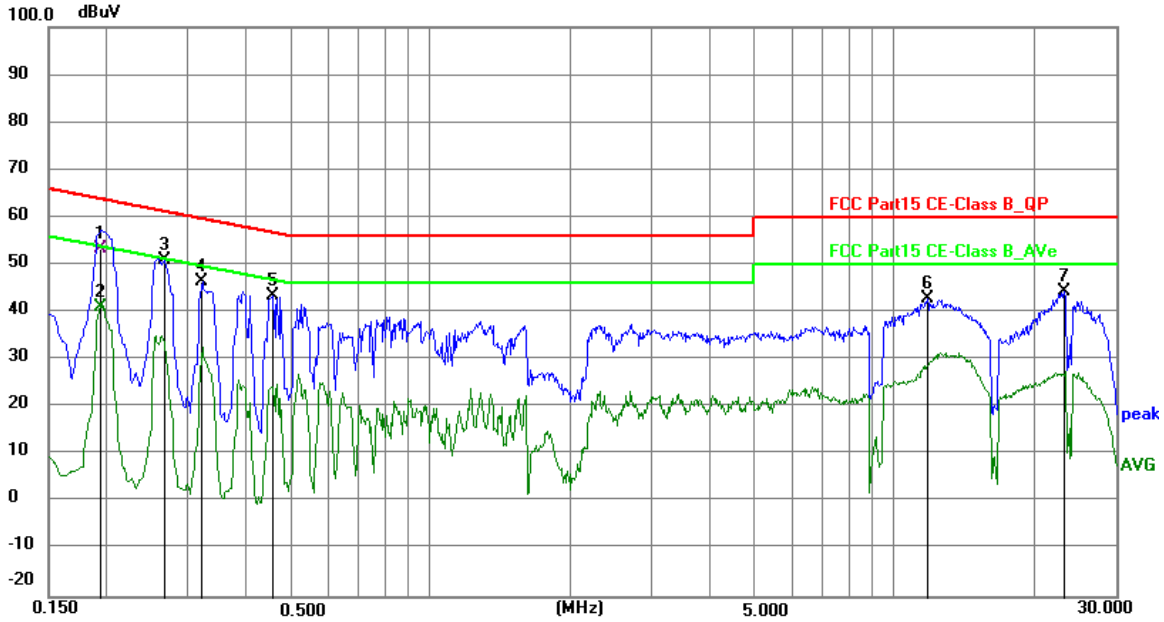
10.3.Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
(2) Setup the EUT and simulator as shown in 10.1
(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.
(4) The bandwidth of test receiver is set at 10KHz.
(5) The frequency range from 150 KHz to 30MHz is checked.

10.4.Test Result

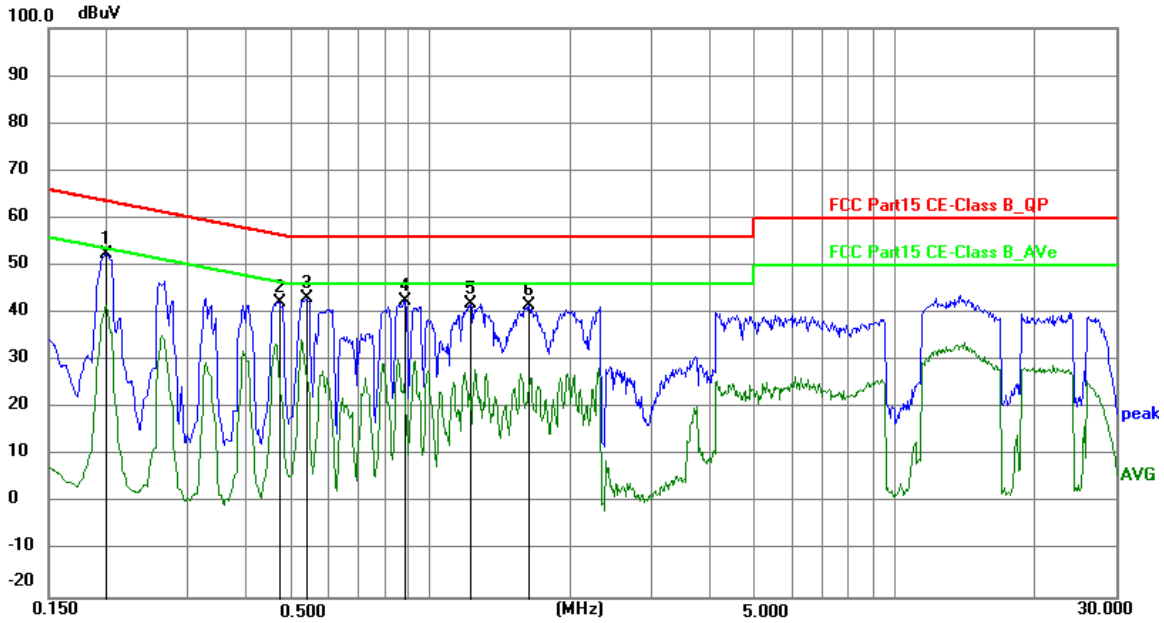
Pass

Polarity: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1949	43.64	9.63	53.27	63.83	-10.56	QP	P	
2	0.1949	31.42	9.63	41.05	53.83	-12.78	AVG	P	
3 *	0.2670	41.38	9.63	51.01	61.21	-10.20	peak	P	
4	0.3209	36.78	9.63	46.41	59.68	-13.27	peak	P	
5	0.4560	33.89	9.62	43.51	56.77	-13.26	peak	P	
6	11.7960	33.16	9.73	42.89	60.00	-17.11	peak	P	
7	23.2170	34.49	9.77	44.26	60.00	-15.74	peak	P	

Polarity: N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1995	42.95	9.63	52.58	63.63	-11.05	peak	P	
2	0.4695	32.72	9.62	42.34	56.52	-14.18	peak	P	
3	0.5415	33.46	9.62	43.08	56.00	-12.92	peak	P	
4	0.8835	32.90	9.64	42.54	56.00	-13.46	peak	P	
5	1.2164	32.30	9.64	41.94	56.00	-14.06	peak	P	
6	1.6305	32.00	9.65	41.65	56.00	-14.35	peak	P	

11. ANTENNA REQUIREMENTS

11.1.Limit

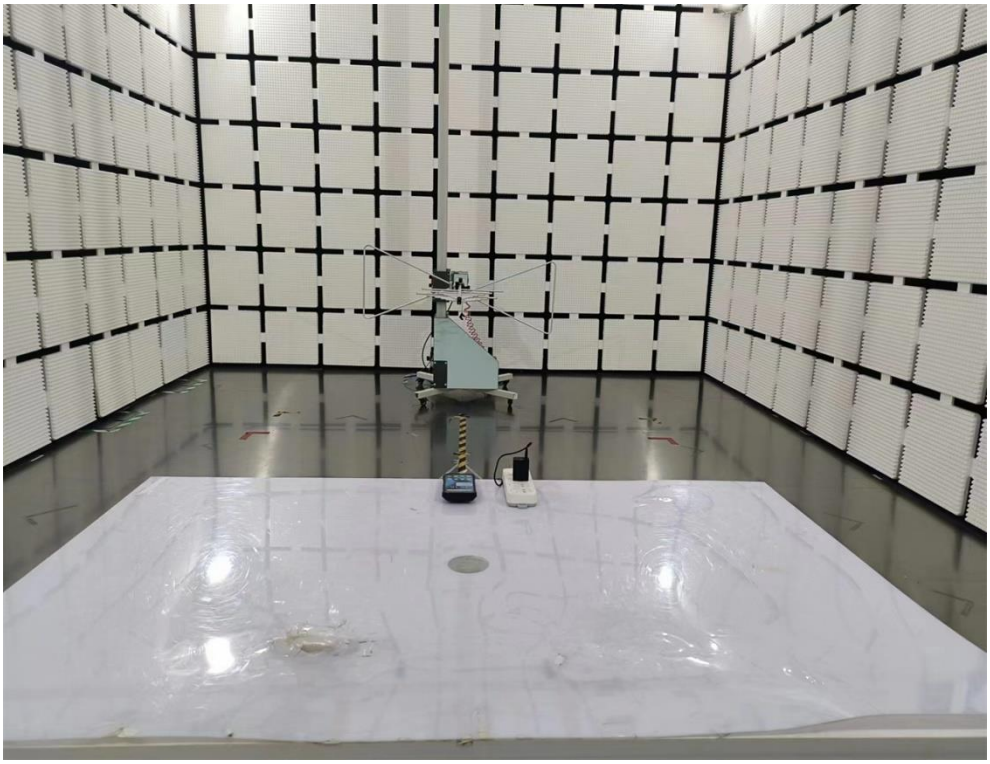
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

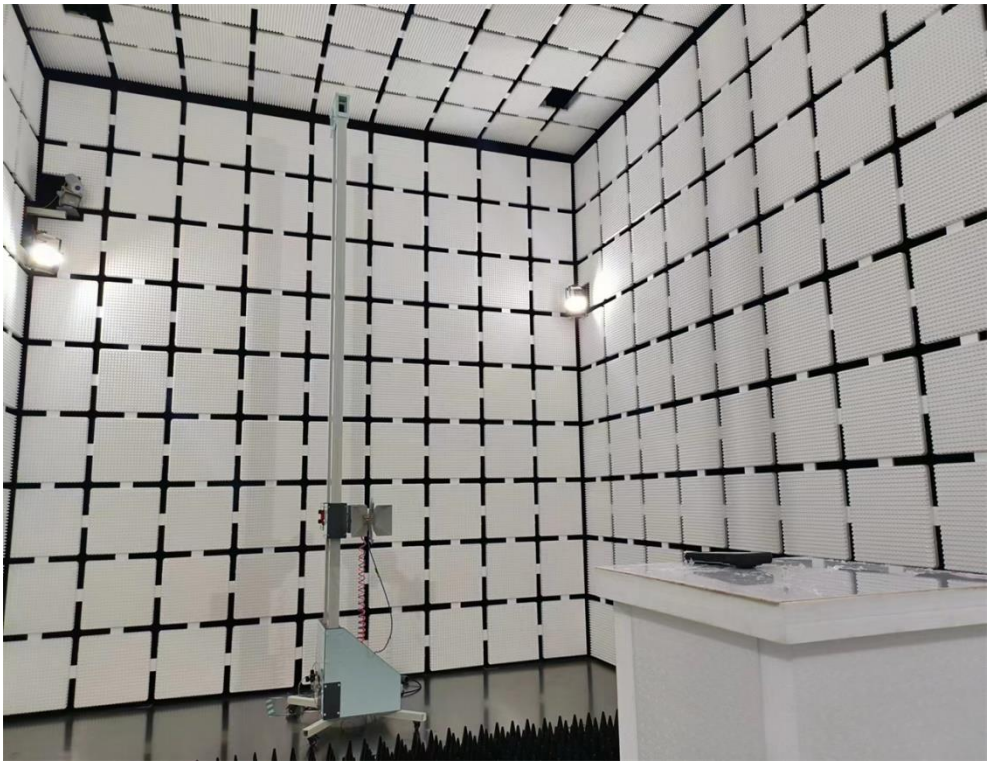
11.2.Result

The EUT antenna is LDS Antenna. It comply with the standard requirement.

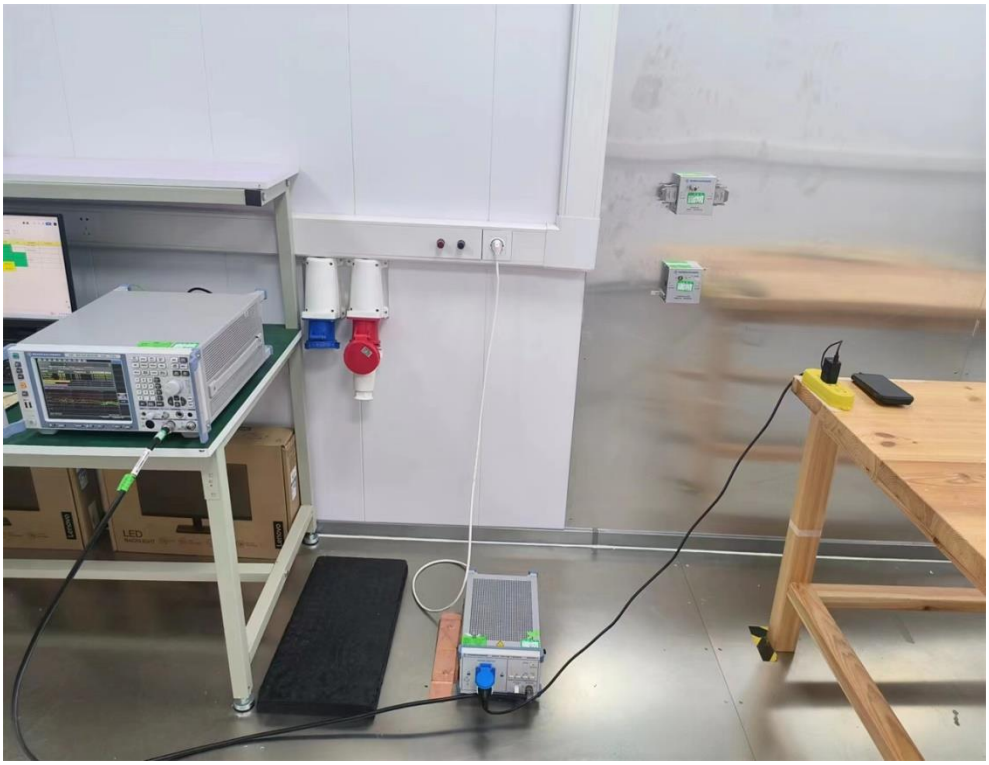
12. TEST SETUP PHOTO

12.1.Photo of Radiated Emission test





12.2.Photo of Conducted Emission test

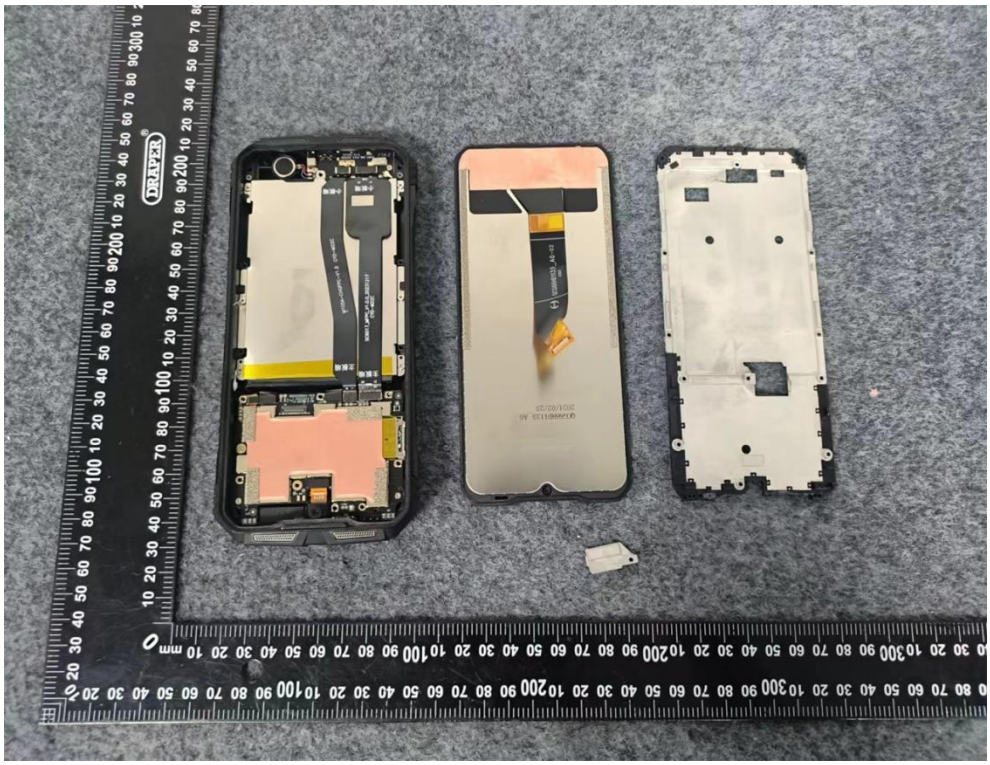


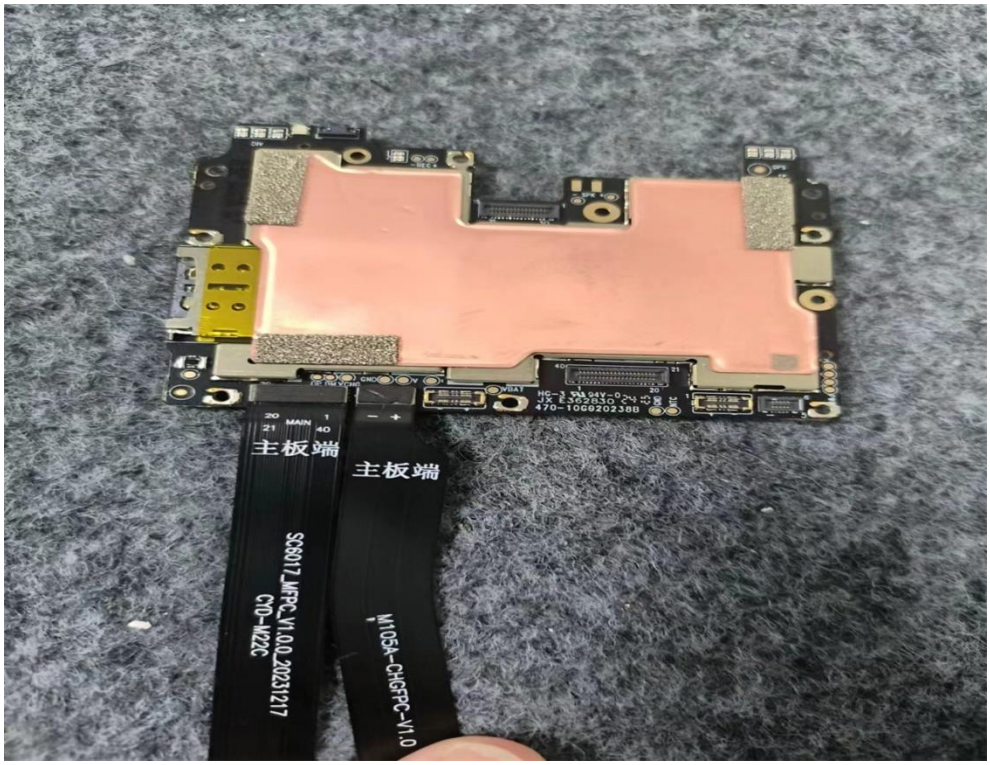
12.3.Conducted Test Photos

13. PHOTOS OF EUT

DOOGEE

TF/SIMCARD




主板端
主板端
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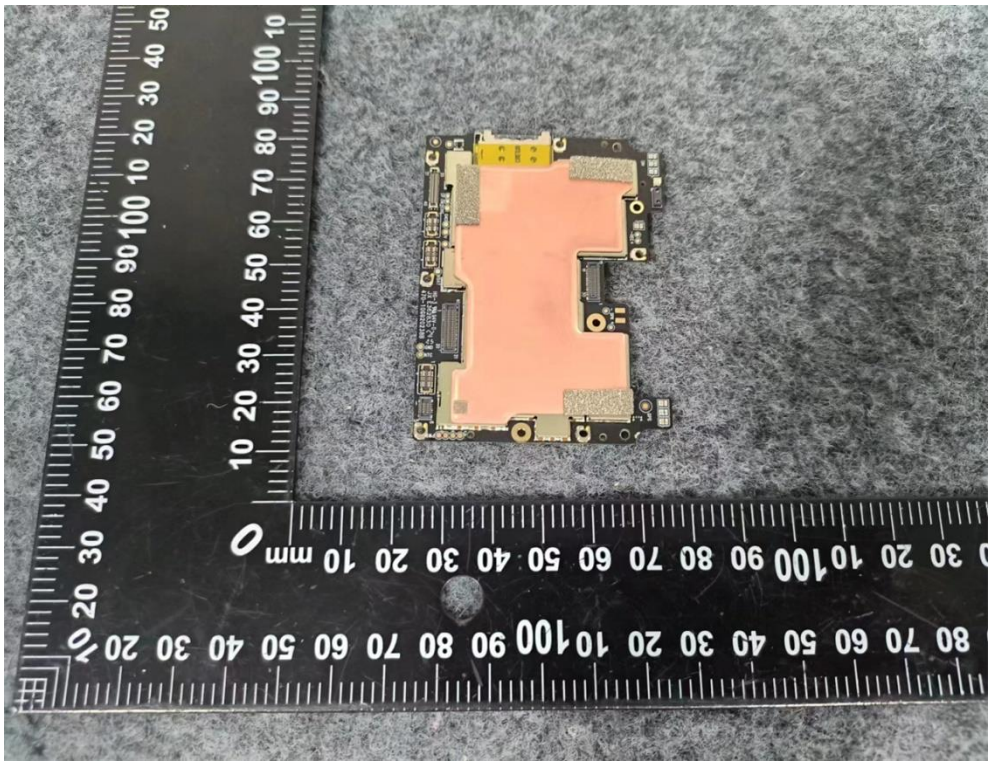
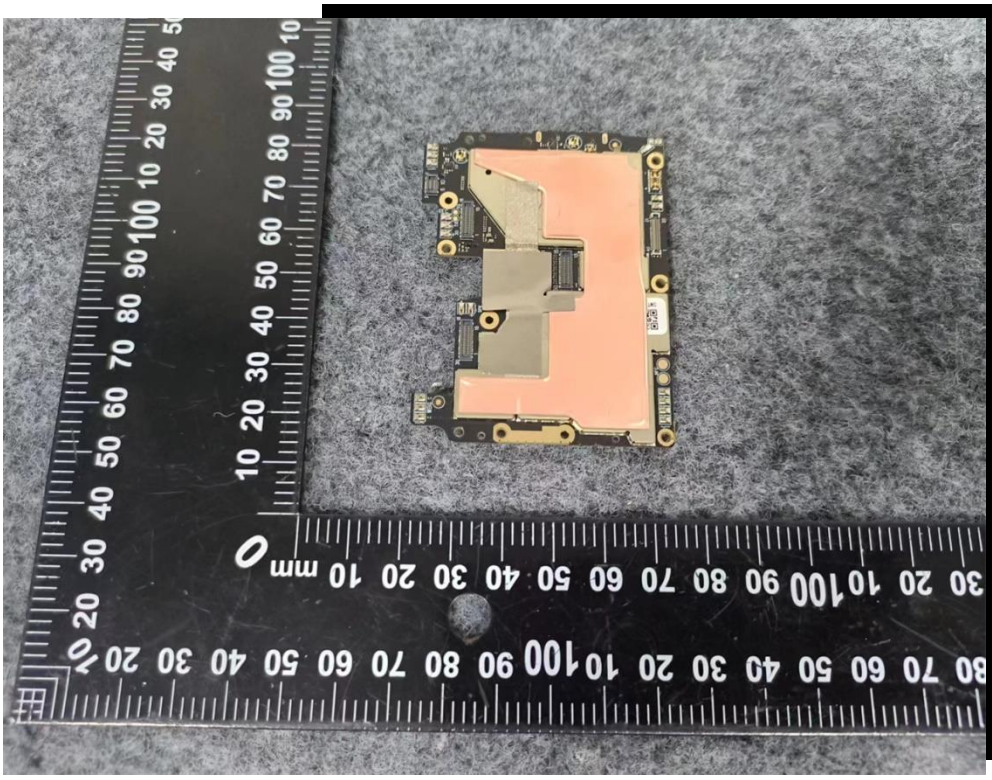
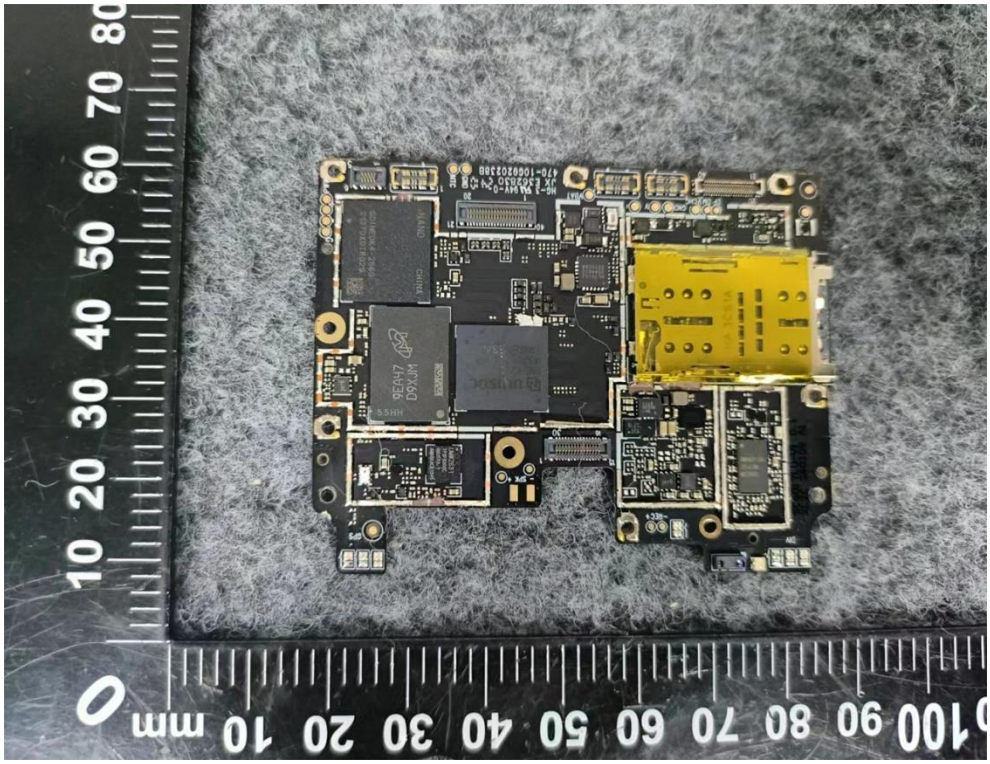
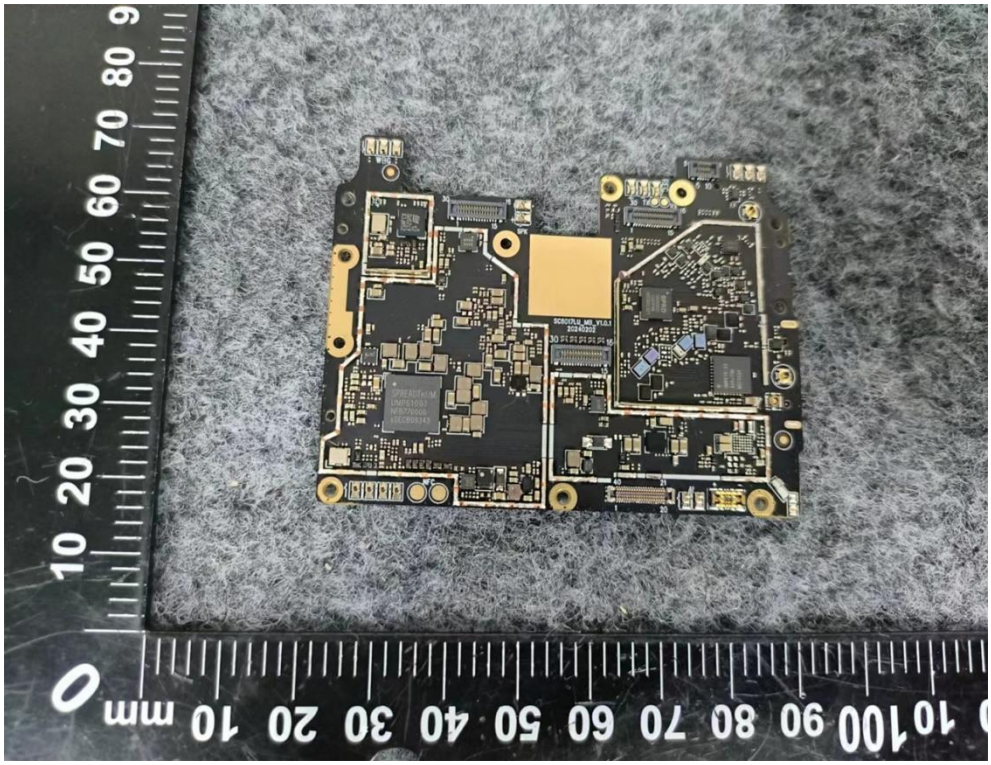
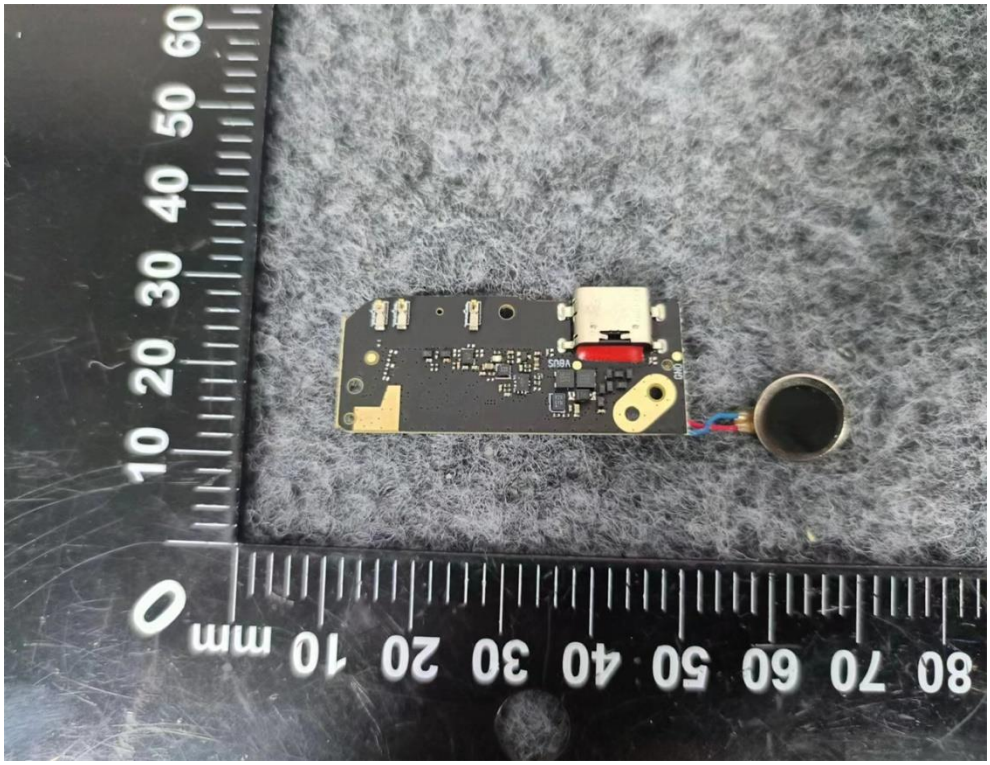
CYD-M22C
M10SA-CHGFPC-V1.0

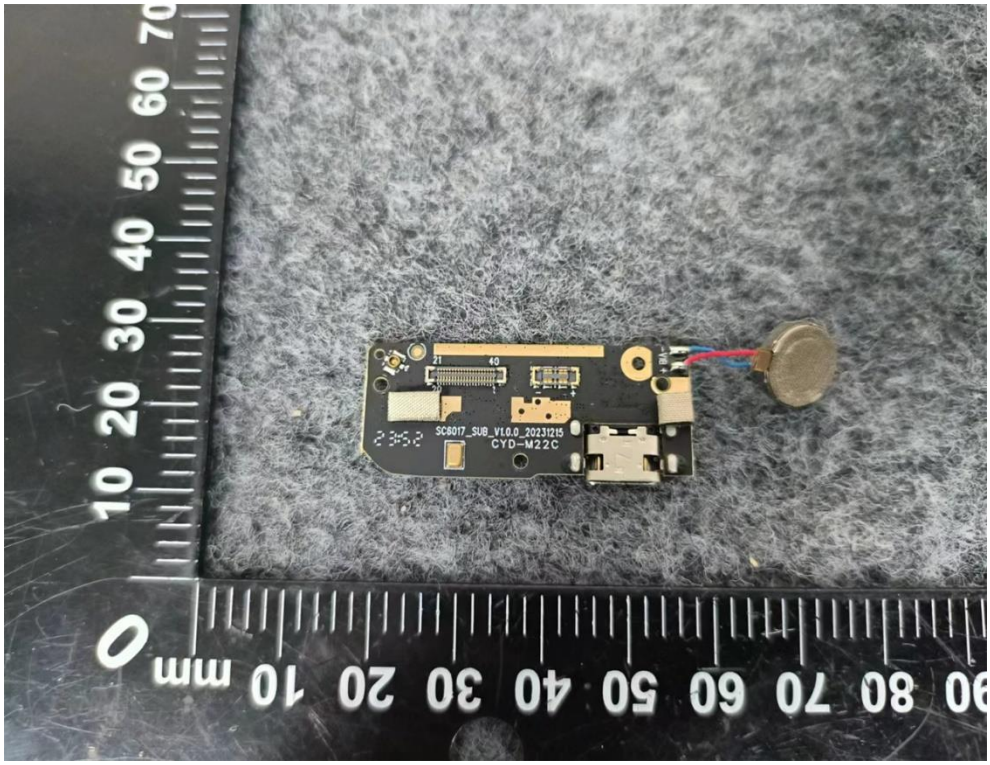











SC8017_SUB_V1.0.0_20231215
CYD-M22C

-------END OF REPORT-------