



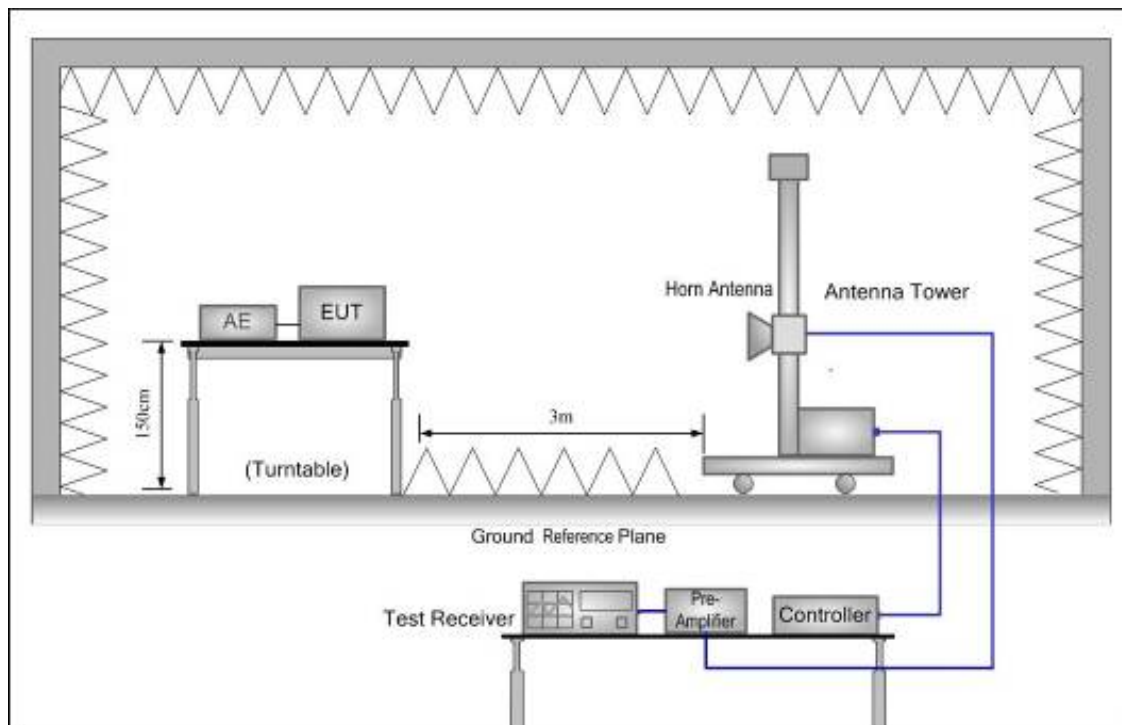
From 1G-25GHz

All modes had been tested, only show the worst mode GFSK

Test Mode: GFSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	54.23	V	33.93	10.18	34.26	64.08	74	-9.92	PK
4804	42.05	V	33.93	10.18	34.26	51.90	54	-2.10	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	53.01	H	33.93	10.18	34.26	62.86	74	-11.14	PK
4804	39.35	H	33.93	10.18	34.26	49.20	54	-4.80	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX Mid									
4882	53.45	V	33.95	10.2	34.97	62.63	74	-11.37	PK
4882	37.05	V	33.95	10.2	34.97	46.23	54	-7.77	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
4882	51.08	H	33.95	10.2	34.97	60.26	74	-13.74	PK
4882	40.56	H	33.95	10.2	34.97	49.74	54	-4.26	AV
7323	/	/	/	/	/	/	/	/	/
9764	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX High									
4960	50.34	V	33.98	10.22	34.25	60.29	74	-13.71	PK
4960	38.31	V	33.98	10.22	34.25	48.26	54	-5.74	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	49.99	H	33.98	10.22	34.25	59.94	74	-14.06	PK
4960	37.86	H	33.98	10.22	34.25	47.81	54	-6.19	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
Note:									
1, Result = Read level + Antenna factor + cable loss-Amp factor									
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

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			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	73.85	-21.47	52.38	74.00	-21.62	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	75.01	-26.12	48.89	74.00	-25.11	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.83	-21.47	50.36	74.00	-23.64	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	72.01	-26.12	45.89	74.00	-28.11	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	74.05	-25.29	48.76	74.00	-25.24	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	75.25	-25.29	49.96	74.00	-24.04	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					$\pi/4$ DQPSK TX 2402MHz			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	71.56	-21.47	50.09	74.00	-23.91	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	72.31	-26.12	46.19	74.00	-27.81	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	72.02	-21.47	50.55	74.00	-23.45	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	71.31	-26.12	45.19	74.00	-28.81	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results					PASS			
Frequency Range					2450MHz~2550MHz			
Test Mode					$\pi/4$ DQPSK TX 2480MHz			
1	2483.5	H	74.52	-25.29	49.23	74.00	-24.77	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	75.83	-25.29	50.54	74.00	-23.46	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			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	72.56	-21.47	51.09	74.00	-22.91	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	70.31	-26.12	44.19	74.00	-29.81	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	72.63	-21.47	51.16	74.00	-22.84	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	70.82	-26.12	44.7	74.00	-29.30	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	73.85	-25.29	48.56	74.00	-25.44	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	72.85	-25.29	47.56	74.00	-26.44	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					GFSK Hopping			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	73.05	-21.47	51.58	74.00	-22.42	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	70.85	-26.12	44.73	74.00	-29.27	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.08	-21.47	49.61	74.00	-24.39	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	70.04	-26.12	43.92	74.00	-30.08	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results					PASS			
Frequency Range					2450MHz~2550MHz			
Test Mode					GFSK Hopping			
1	2483.5	H	71.05	-25.29	45.76	74.00	-28.24	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	72.85	-25.29	47.56	74.00	-26.44	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.								

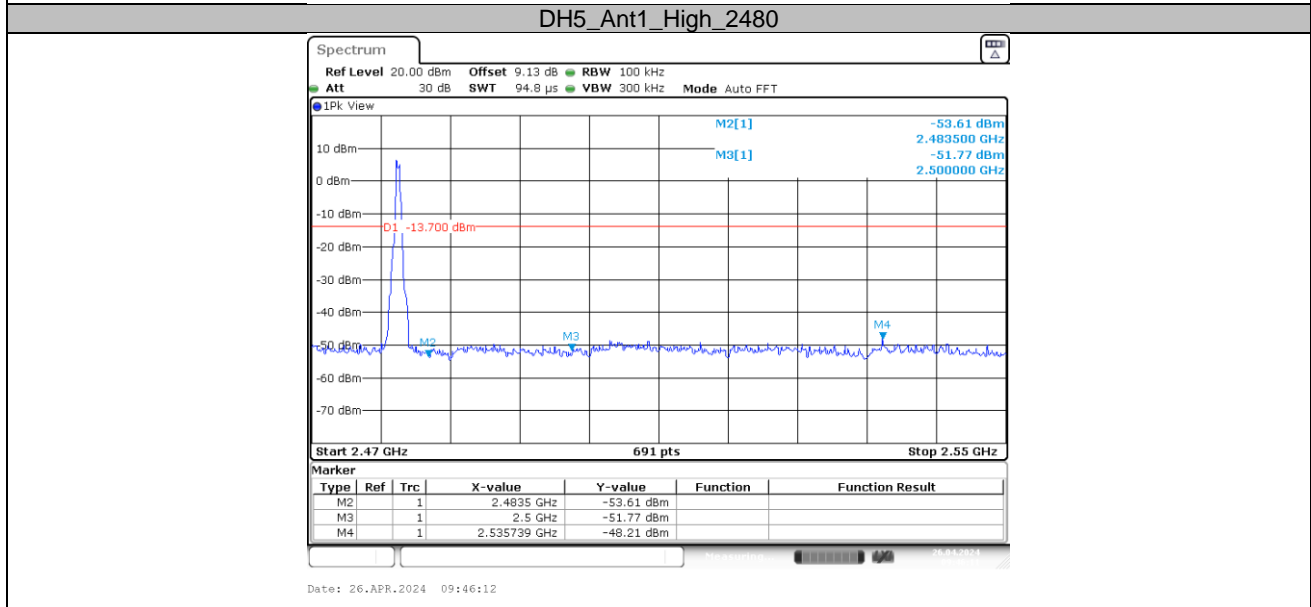
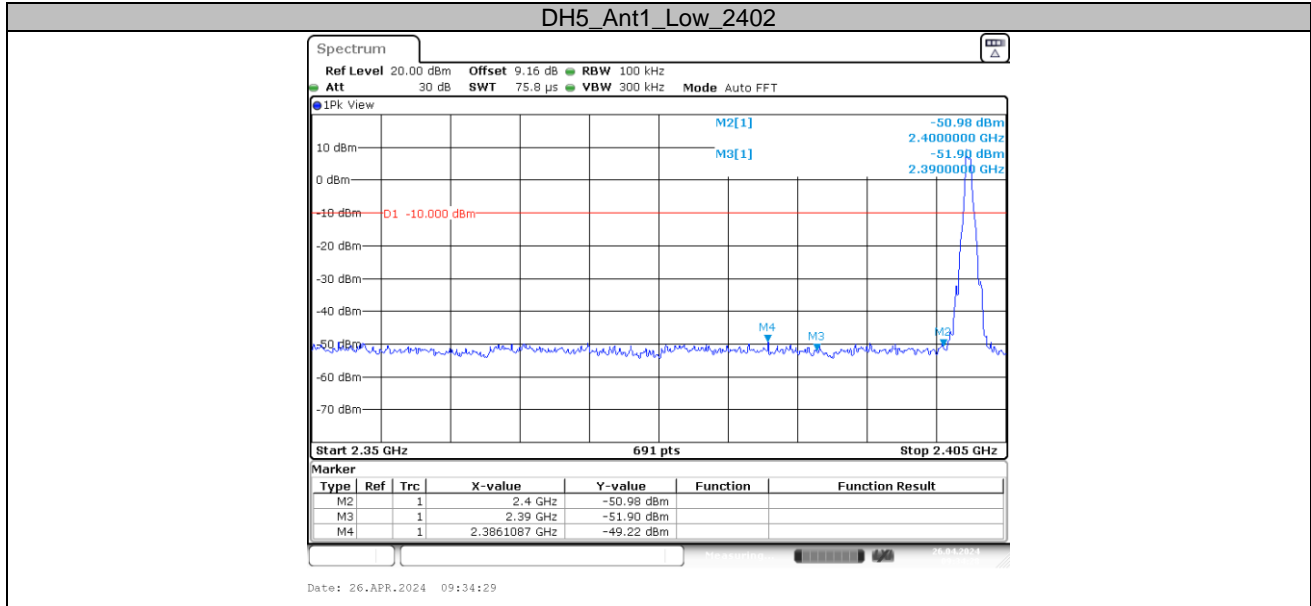
Test Results					PASS			
Frequency Range					2310MHz~2410MHz			
Test Mode					π/4 DQPSK Hopping			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	70.52	-21.47	49.05	74.00	-24.95	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	68.96	-26.12	42.84	74.00	-31.16	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.85	-21.47	50.38	74.00	-23.62	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	69.38	-26.12	43.26	74.00	-30.74	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	70.15	-25.29	44.86	74.00	-29.14	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	70.41	-25.29	45.12	74.00	-28.88	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			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	72.05	-21.47	50.58	74.00	-23.42	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	69.86	-26.12	43.74	74.00	-30.26	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	71.02	-21.47	49.55	74.00	-24.45	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	68.62	-26.12	42.5	74.00	-31.50	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results					PASS			
Frequency Range					2450MHz~2550MHz			
Test Mode					8DPSK Hopping			
1	2483.5	H	69.84	-25.29	44.55	74.00	-29.45	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	68.92	-25.29	43.63	74.00	-30.37	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.								

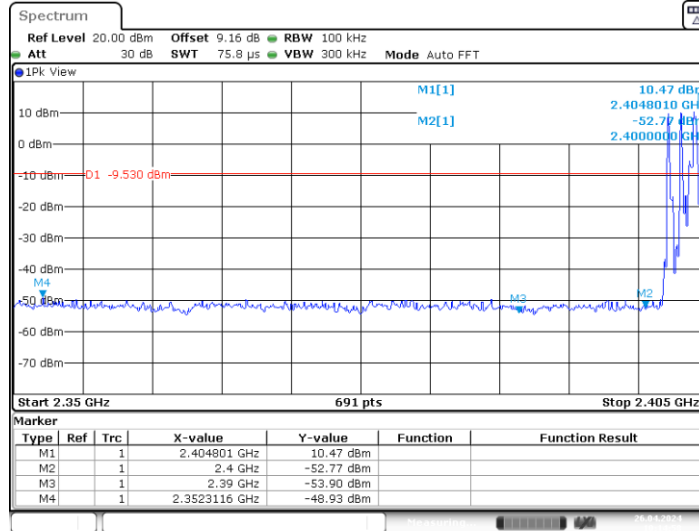


Conducted Method

TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	10.00	-49.22	≤-10	PASS
		High	2480	6.30	-48.21	≤-13.7	PASS
		Low	Hop_2402	10.47	-48.93	≤-9.53	PASS
		High	Hop_2480	8.53	-48.52	≤-11.47	PASS
2DH5	Ant1	Low	2402	9.94	-49.33	≤-10.06	PASS
		High	2480	5.48	-48.71	≤-14.52	PASS
		Low	Hop_2402	7.92	-49.3	≤-12.08	PASS
		High	Hop_2480	5.18	-47.98	≤-14.82	PASS
3DH5	Ant1	Low	2402	9.91	-49.22	≤-10.09	PASS
		High	2480	5.21	-48.66	≤-14.79	PASS
		Low	Hop_2402	8.12	-48.78	≤-11.88	PASS
		High	Hop_2480	5.63	-48.71	≤-14.37	PASS

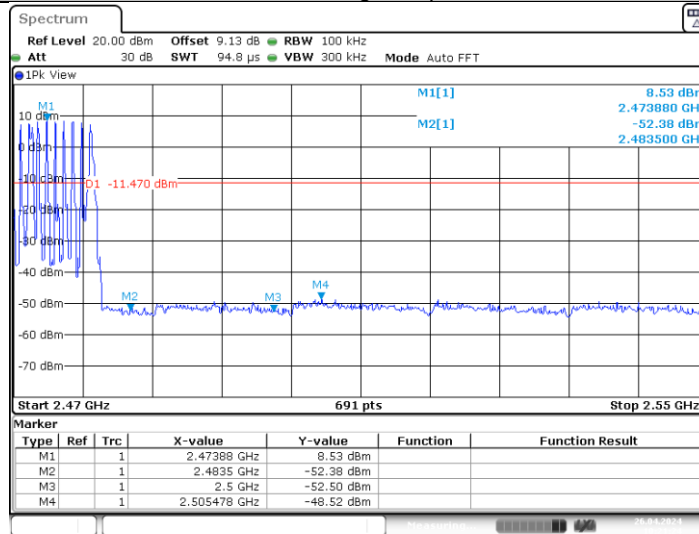


DH5_Ant1_Low_Hop_2402



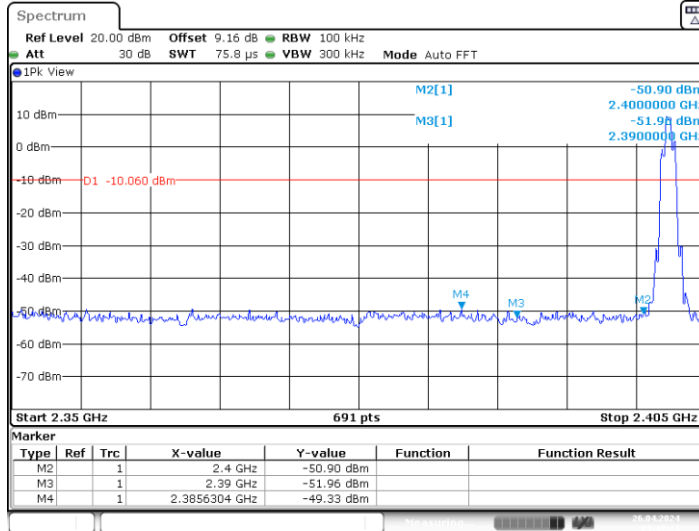
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DH5_Ant1_High_Hop_2480

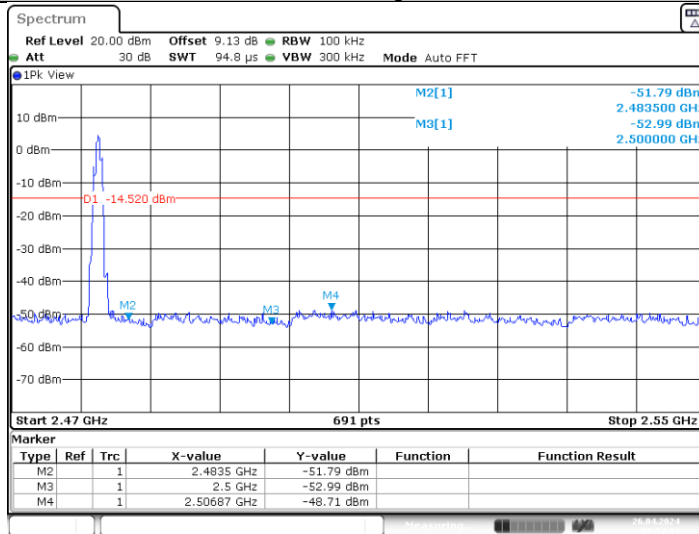


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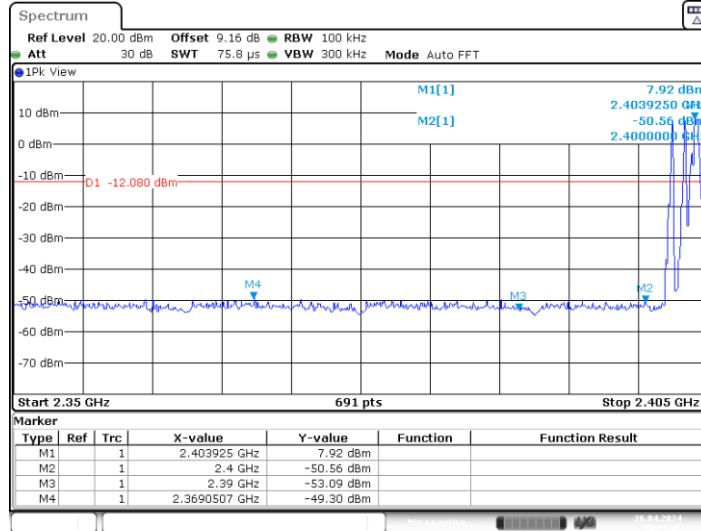
2DH5_Ant1_Low_2402



2DH5_Ant1_High_2480

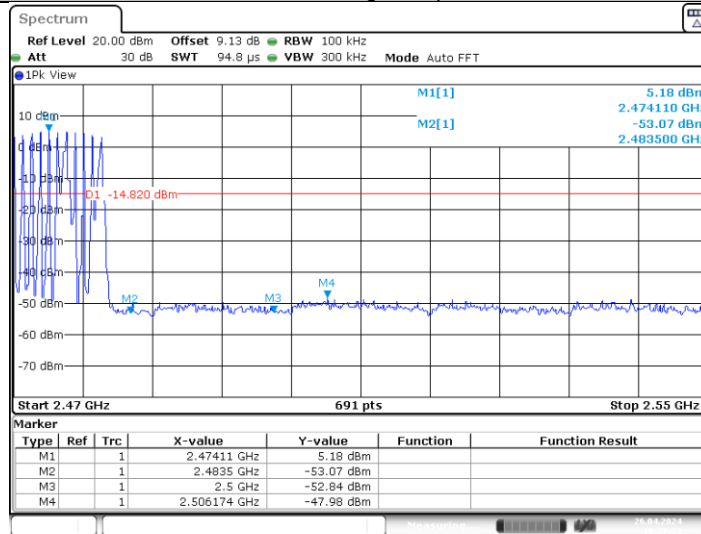


2DH5_Ant1_Low_Hop_2402



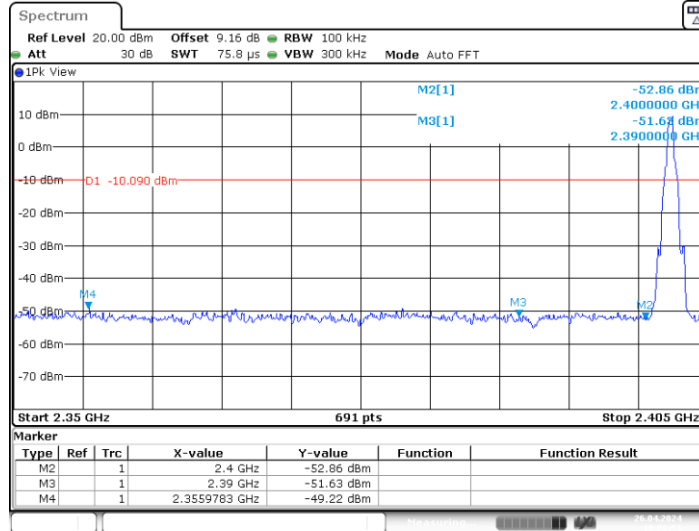
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2DH5_Ant1_High_Hop_2480



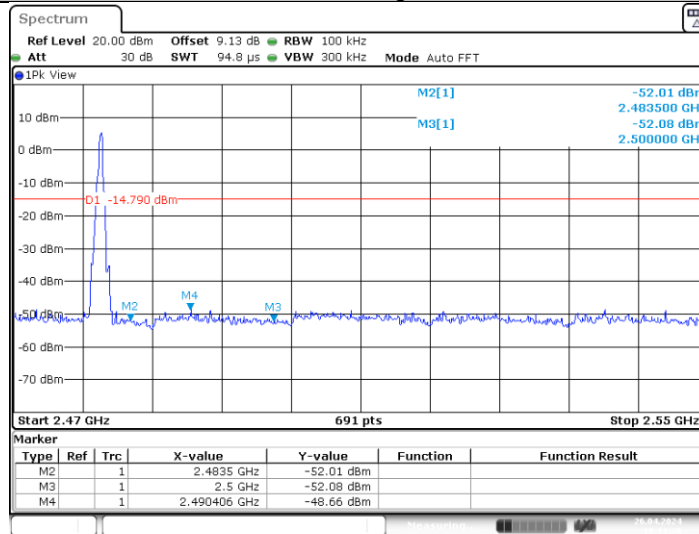
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3DH5_Ant1_Low_2402



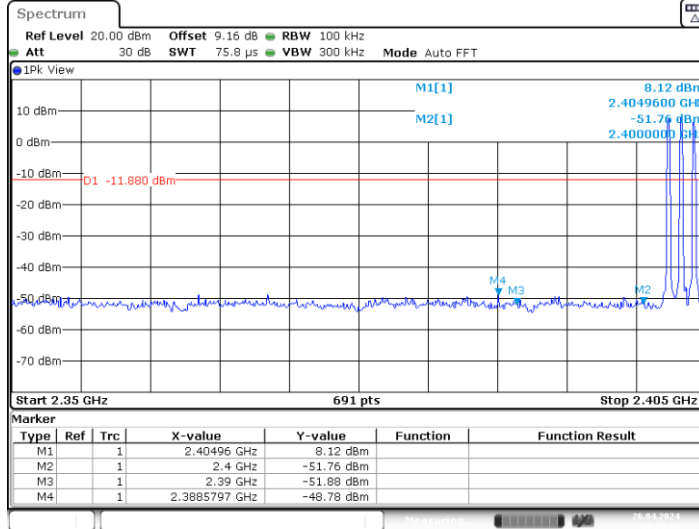
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3DH5_Ant1_High_2480



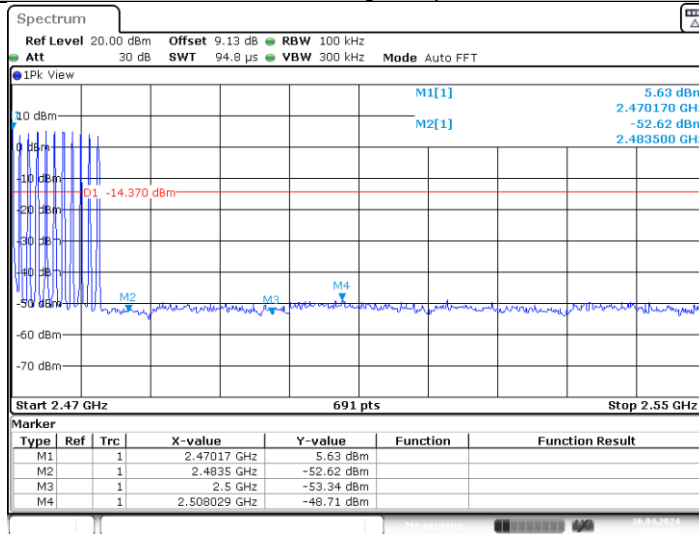
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3DH5_Ant1_Low_Hop_2402



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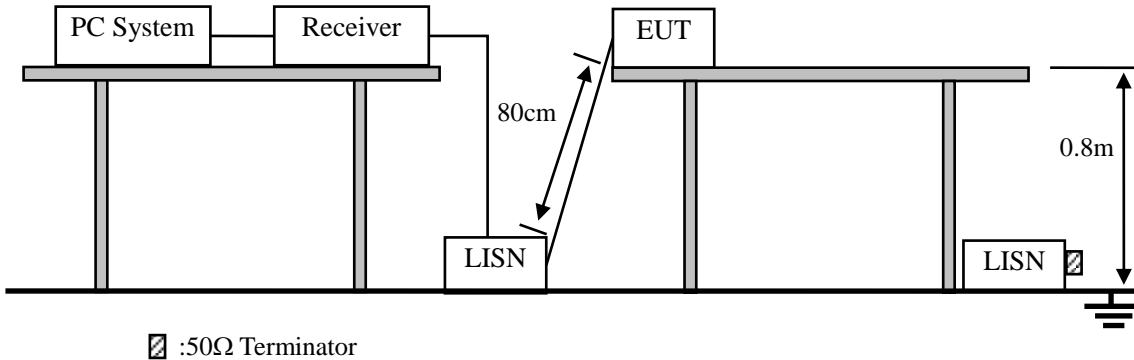
3DH5_Ant1_High_Hop_2480



Date: 26.APR.2024 10:33:58

10. POWER LINE CONDUCTED EMISSIONS

10.1. Block Diagram of Test Setup



10.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
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.

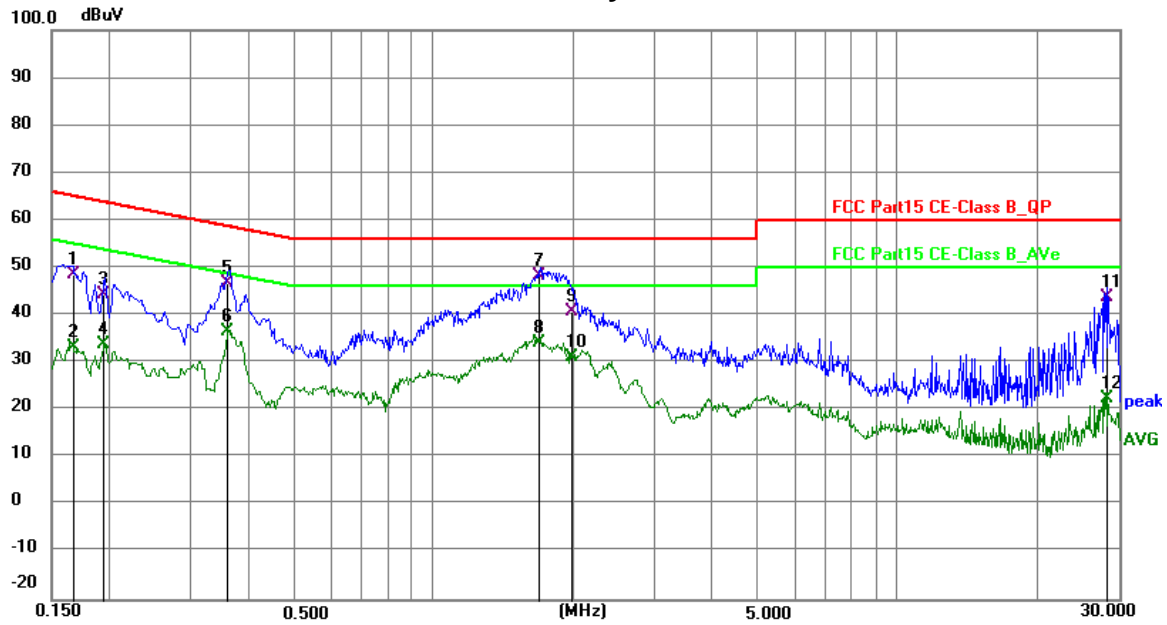
10.3. Test Procedure

- (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

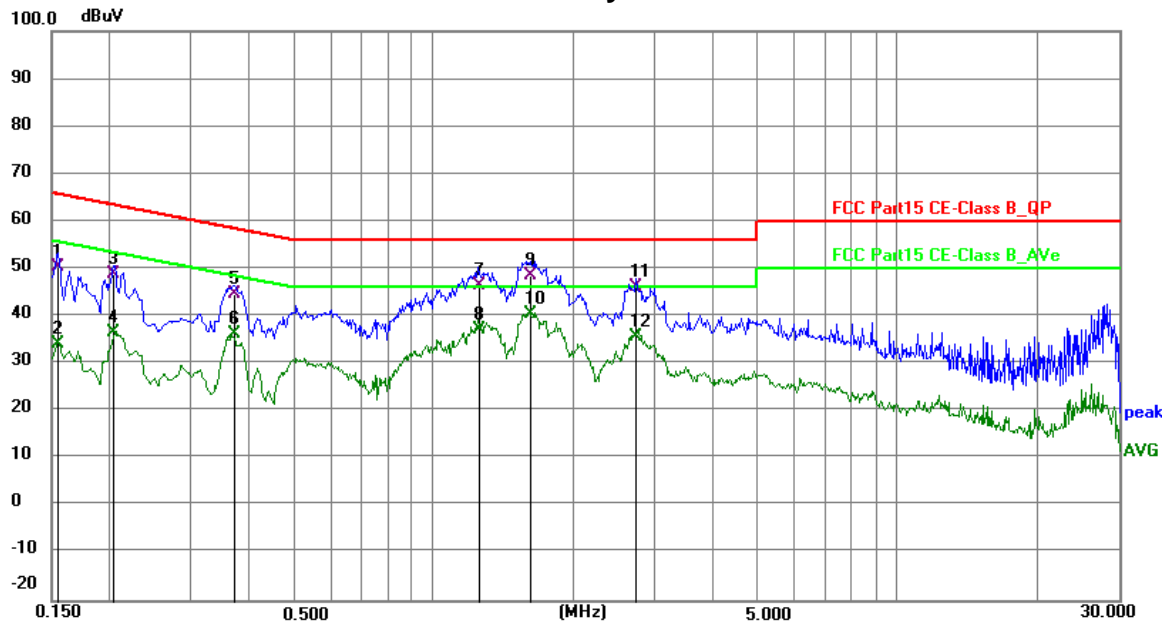
Pass

Polarity: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1666	38.93	9.63	48.56	65.13	-16.57	QP	P	
2	0.1666	23.73	9.63	33.36	55.13	-21.77	AVG	P	
3	0.1949	34.60	9.63	44.23	63.83	-19.60	QP	P	
4	0.1949	24.29	9.63	33.92	53.83	-19.91	AVG	P	
5	0.3580	37.18	9.63	46.81	58.77	-11.96	QP	P	
6	0.3580	26.88	9.63	36.51	48.77	-12.26	AVG	P	
7 *	1.6935	38.71	9.65	48.36	56.00	-7.64	QP	P	
8	1.6935	24.63	9.65	34.28	46.00	-11.72	AVG	P	
9	1.9892	31.23	9.65	40.88	56.00	-15.12	QP	P	
10	1.9892	21.64	9.65	31.29	46.00	-14.71	AVG	P	
11	28.3064	34.14	9.74	43.88	60.00	-16.12	QP	P	
12	28.3064	12.57	9.74	22.31	50.00	-27.69	AVG	P	

Polarity: N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1544	40.67	9.62	50.29	65.76	-15.47	QP	P	
2	0.1544	24.64	9.62	34.26	55.76	-21.50	AVG	P	
3	0.2040	39.29	9.63	48.92	63.45	-14.53	QP	P	
4	0.2040	26.89	9.63	36.52	53.45	-16.93	AVG	P	
5	0.3704	35.06	9.62	44.68	58.49	-13.81	QP	P	
6	0.3704	26.63	9.62	36.25	48.49	-12.24	AVG	P	
7	1.2620	36.87	9.64	46.51	56.00	-9.49	QP	P	
8	1.2620	27.59	9.64	37.23	46.00	-8.77	AVG	P	
9	1.6173	38.87	9.65	48.52	56.00	-7.48	QP	P	
10 *	1.6173	30.66	9.65	40.31	46.00	-5.69	AVG	P	
11	2.7330	36.47	9.65	46.12	56.00	-9.88	QP	P	
12	2.7330	26.10	9.65	35.75	46.00	-10.25	AVG	P	

11. ANTENNA REQUIREMENTS

11.1. Limit

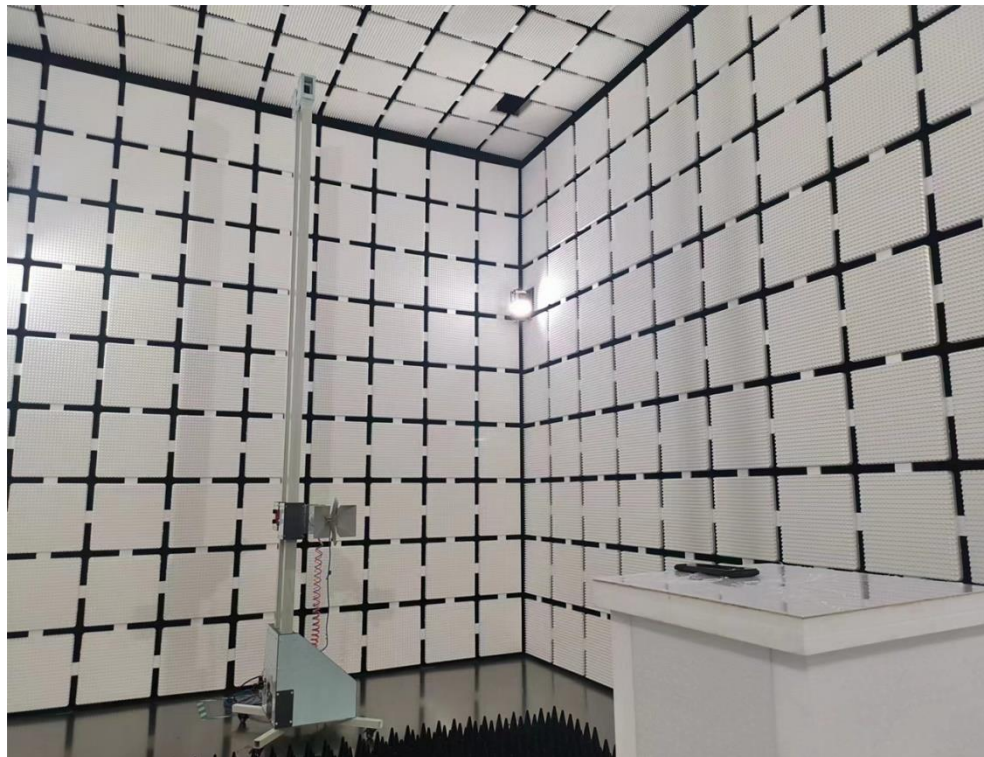
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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

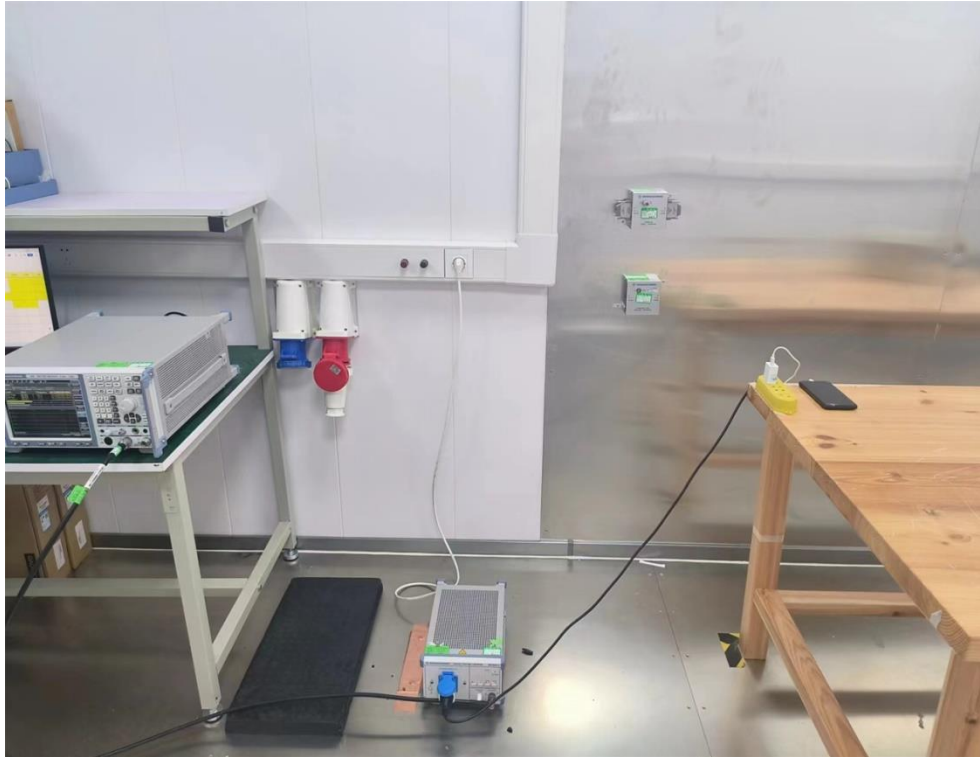
The EUT antenna is PIFA Antenna. It comply with the standard requirement.

12. TEST SETUP PHOTO

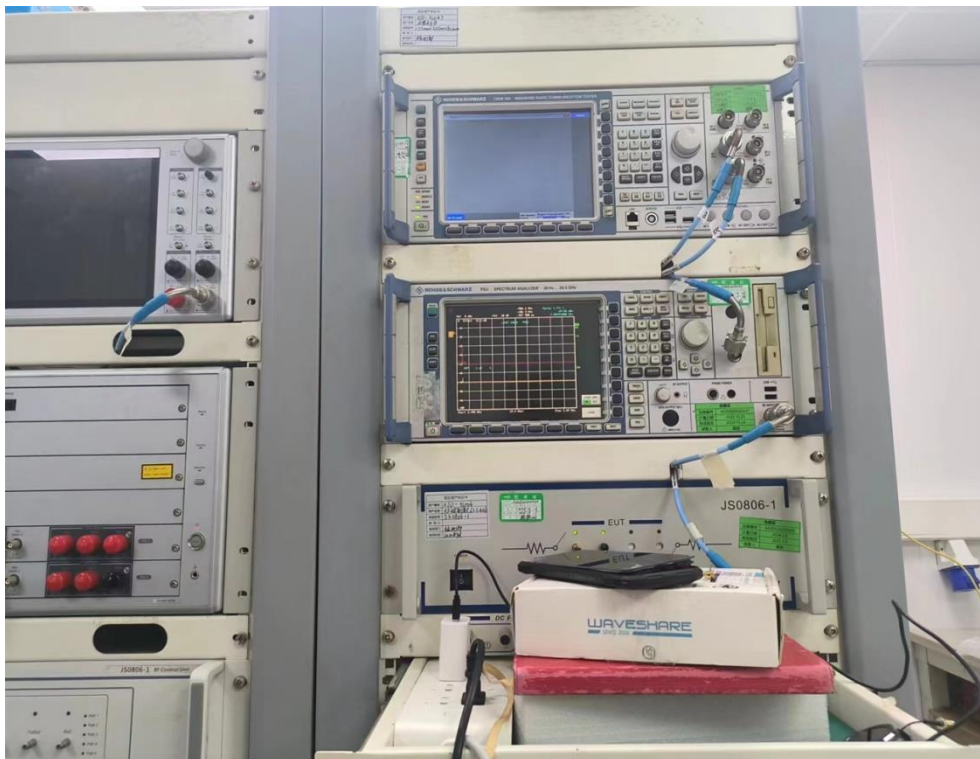
12.1. Photo of Radiated Emission test



12.2.Photo of Conducted Emission test



12.3.Conducted Test Photos



13. PHOTOS OF EUT



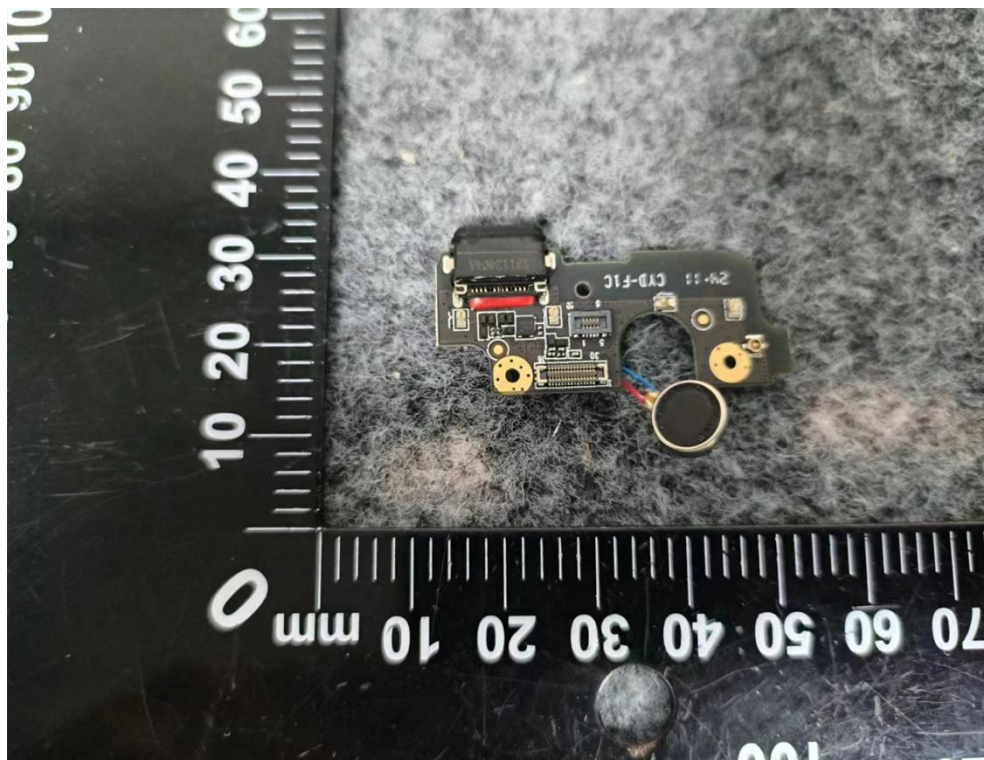
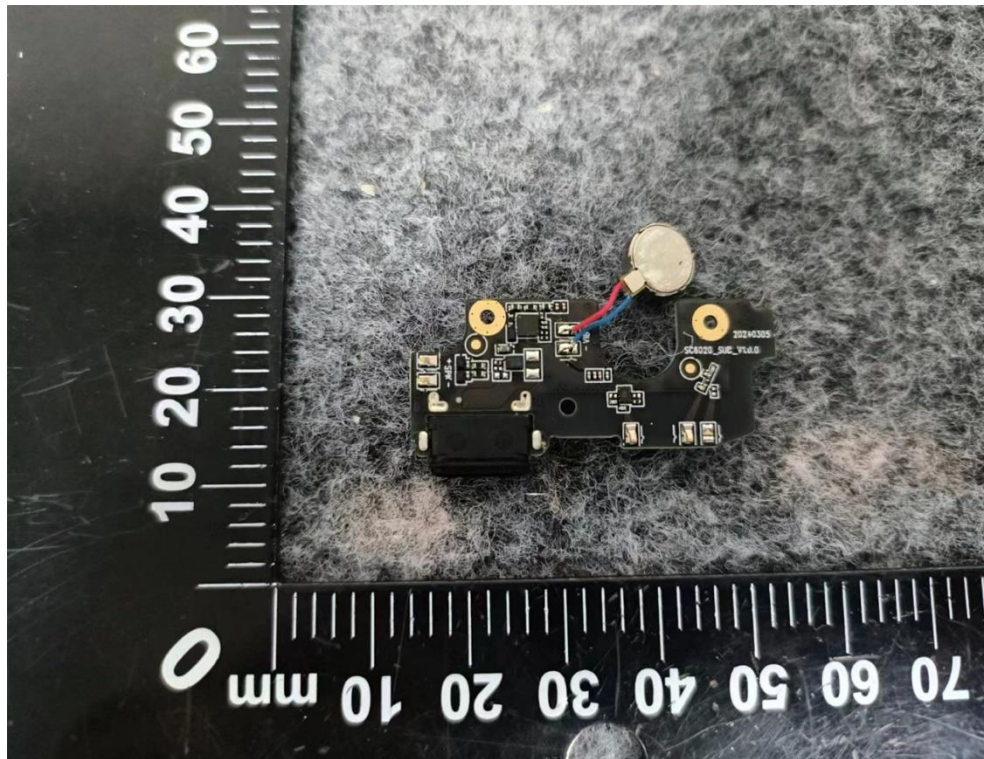


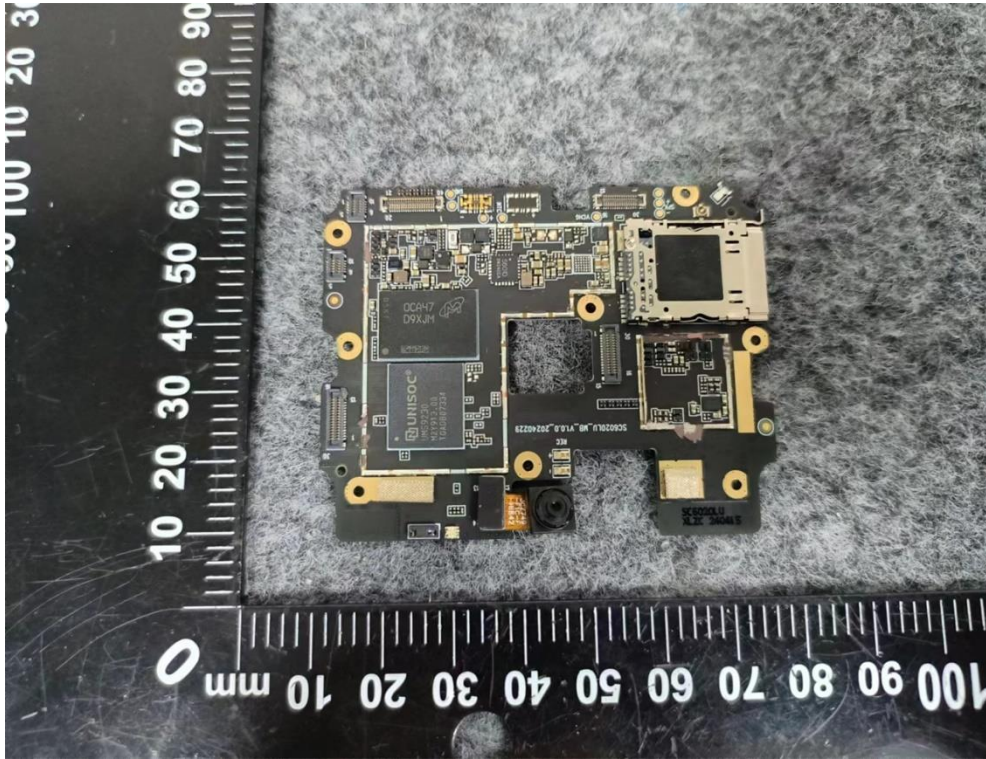












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