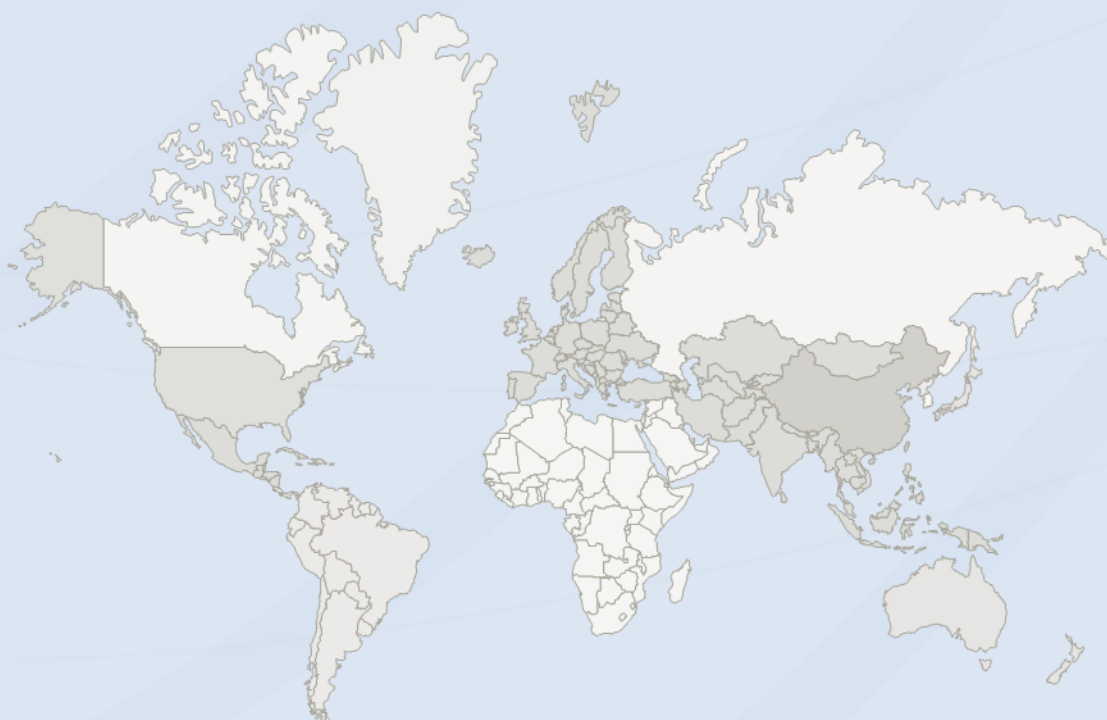


FCC TEST REPORT

Report No. : NTC-ER2409035

Applicant's name : ETI Solid State Lighting, Inc

Address..... : 720 Northgate Parkway Wheeling, IL60090



DONGGUAN NEW TESTING CENTRE CO., LTD

ⒺAddress: 1F & 3F, No. 1 the 1st North Industry Road Songshan Lake Science & Technology Park Dongguan, People's Republic of China 523808

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✉E-mail: dave@ntc-cert.com

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TEST REPORT DECLARE

FCC ID	:	XZH-B040252024
Applicant	:	ETI Solid State Lighting, Inc
Address	:	720 Northgate Parkway Wheeling, IL60090
Equipment under Test	:	LED Cabinet Light
Model No	:	B04020@##*,B04023@##*,B04025@##*
Trade Mark	:	ETI LIGHTING, Commercial Electric, Hampton Bay, Menards, PATRIOT LIGHTING
Manufacturer 1	:	ETI Solid State Lighting (Zhuhai) Ltd
Address1	:	No.1, Zhongzhu Road South,Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China
Manufacturer 2	:	NVC VIETNAM TECHNOLOGY AND LIGHTING COMPANY LIMITED
Address 2	:	PLOT CN9-6, YEN PHONG INDUSTRIAL ZONE (EXPANSION PHASE), YEN TRUNG COMMUNE, YEN PHONG DISTRICT, BAC NINH PROVINCE
Test Laboratory	:	Dongguan New Testing Centre Co., Ltd
Address	:	1F & 3F, No. 1 the 1st North Industry Road Songshan Lake Science & Technology Park Dongguan, People' s Republic of China 523808

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C: 15.247, ANSI C63.10:2020.

We Declare:

The equipment described above is tested by Dongguan New Testing Centre Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan New Testing Centre Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

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

Report No.:	NTC-ER2409035		
Date of Test:	Jun.21, 2024 to Jul.30, 2024	Date of Report:	Sept.13, 2024

Prepared By:

Approved By:

Taylor Chen

Taylor Chen/Engineer



Dave Gao/LAB Manager

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

**** Modified History ****

Version	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2024-09-13	NTC-ER2409035	Dave Gao

1. Summary of test results

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

2. General test informatio

2.1. Description of EUT

EUT* Name	:	LED Cabinet Light
Test model	:	B04025301A
EUT function description	:	Please reference user manual of this device
Power supply	:	AC120V 60Hz
Trade mark	:	N/A
Operation frequency	:	2463MHz
Modulation Type	:	GFSK
Antenna Type	:	wire antenna
Antenna Gain	:	0 dBi
Hardware Version	:	V1.0
Software Version	:	V1.0

Note: 1,EUT is the ab. of equipment under test.

2.2. Detail models

Model	Rating	Note
B04020@##*	AC120V 60Hz	where the “@” may be digits from 0 to 9 for different LED color temperature; the “##” may be digits from 00 to 99 for commercial used code; the “*” may be blank or letter from A to Z for manufacturer internal needs
B04023@##*	AC120V 60Hz	
B04025@##*	AC120V 60Hz	

Note.:1. The 2.4G RF modules are the same in all three models

There are 1 channels provided to the EUT and Channel 01 were selected for testing.

Operation Frequency List :

Channel	Frequency (MHz)
01	2463

Note: The line display in grey is the channel selected to perform test.

2.3. Description of test modes

Mode	Channel	Frequency (MHz)
GFSK	CH1	2463
Note: 1. The test was used to control EUT work in Continuous TX mode, and select test channel, wireless mode 2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power. 3. New battery is used during all tests. 4. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB		

2.4. Block diagram EUT configuration for test



2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-24°C
Humidity range:	40-75%
Pressure range:	86-106kPa

2.6. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.20dB
Uncertainty for Radiation Emission test (30MHz – 1GHz)	4.60dB (Polarize: V)
	4.60dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz – 26GHz)	4.27 dB (Polarize: V)
	4.51 dB (Polarize: H)
Uncertainty for Radiation Emission test (26GHz – 40GHz)	4.60 dB (Polarize: V)
	4.60 dB (Polarize: H)
Bandwidth	±1.2%
Stop Transmitting Time Test	±0.5%
Frequency error	5.8×10^{-8}

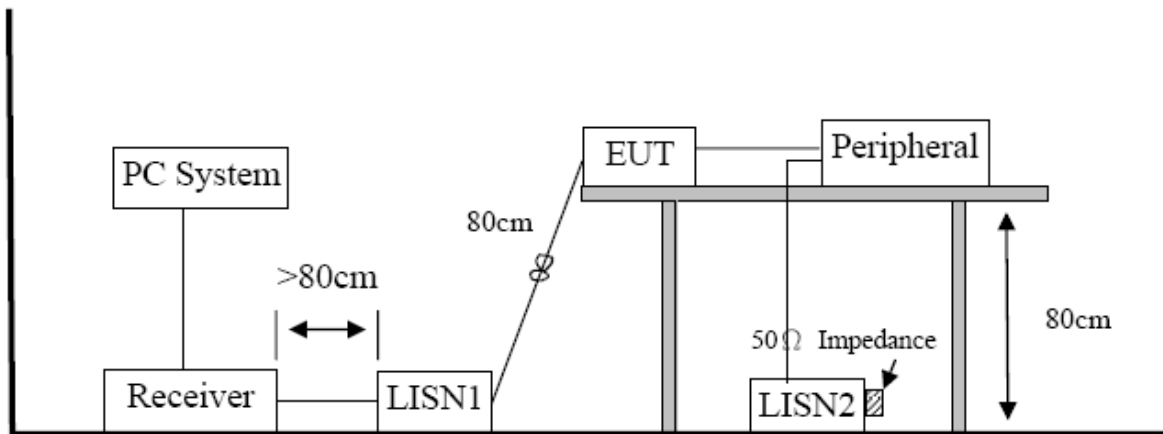
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Power Line Conducted Emission Test

3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESPI	100363	2024-05-14	1 Year
2	LISN	R&S	ENV216	3650.6550.06	2024-05-14	1 Year
3	LISN	KHC	KH3765	37650053	2024-05-14	1 Year
4	8-WIRE ISN for CAT6	R&S	ENY81-CA6	101862	2024-05-14	1 Year
5	RF Cable	HUBER	SUCOFLEX100	30722/4E	2023-05-19	2 Year
6	MEASUREMENT SOFTWARE	FARAD	EZ-EMC(VER:1.1.4.2)	N/A	N/A	N/A

3.2. Block diagram of test setup



3.3. Power Line Conducted Emission Limits (Class B)

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

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

3.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 3.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

3.5. Test Result

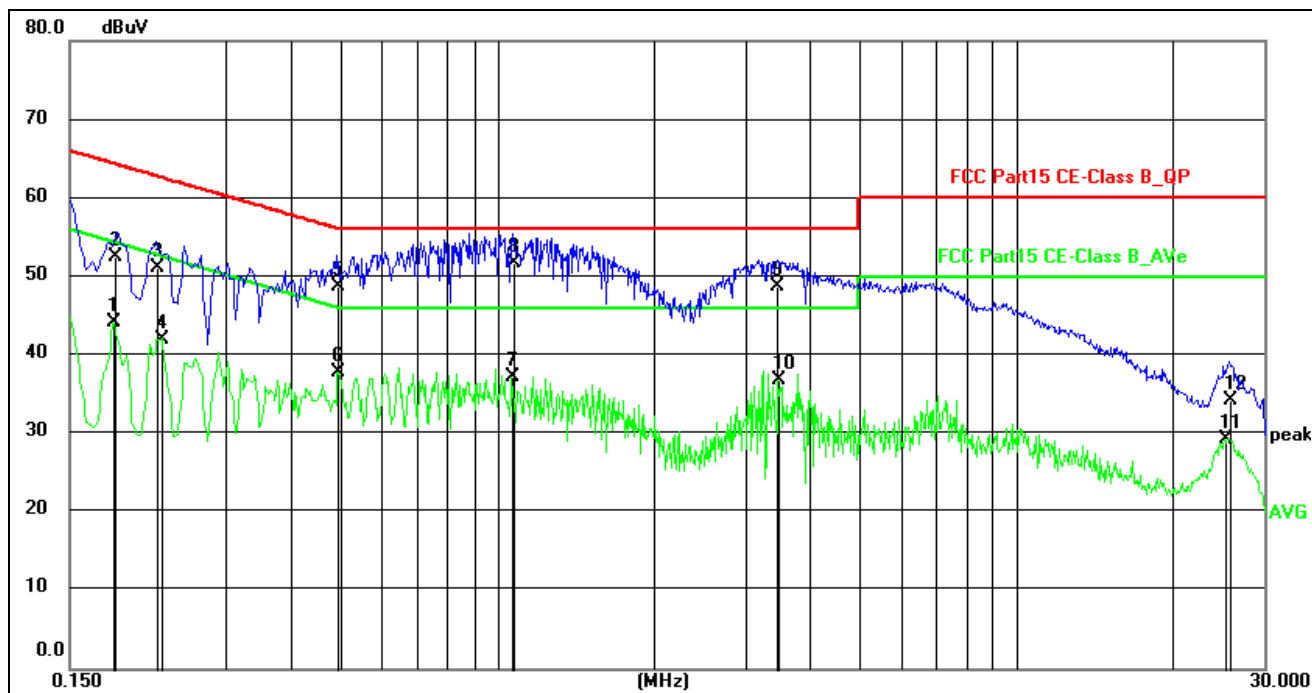
PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” means Average detection.

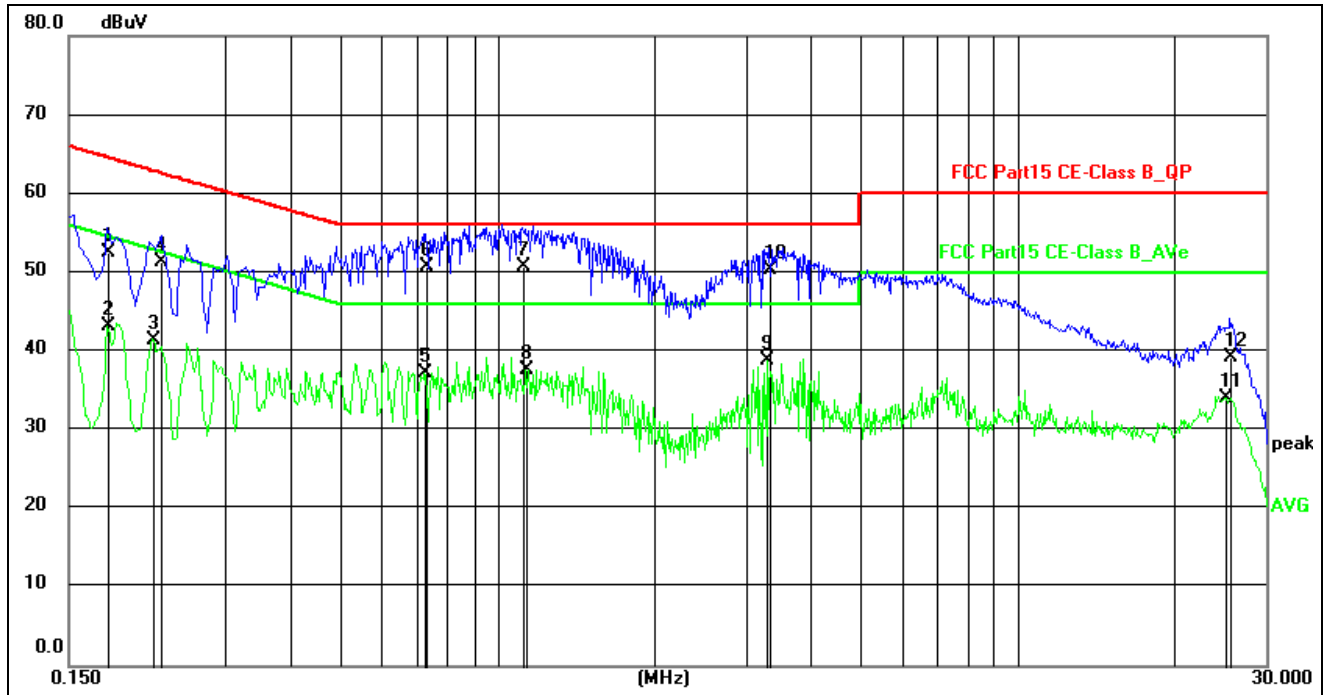
Note3: Measurement = Reading Level + Factor, Margin= Measurement-Limit.

Conducted Emission Test Result



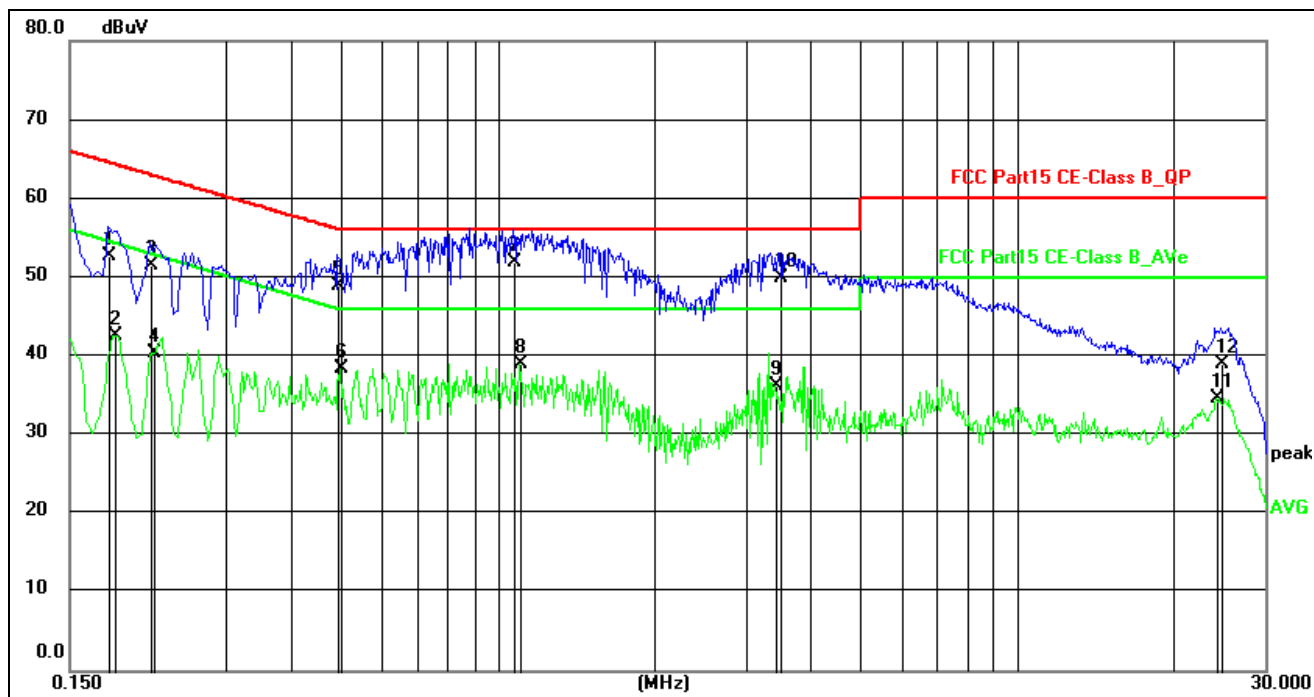
Site:	844LAB	Phase:	L1	Temperature(C):	24(C)
Limit:	FCC Part15 CE-Class B_QP			Humidity(%):	63%
EUT:	Main Light	Test Time:	2024/7/5 18:31:35		
M/N.:	B04025301A	Power Rating:	AC120V/60Hz		
Mode:	Lighting	Test Engineer:			
Note:	Main Light				

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1819	32.98	11.14	44.12	54.40	-10.28	AVG	
2	0.1835	41.41	11.14	52.55	64.33	-11.78	QP	
3	0.2220	40.01	11.14	51.15	62.74	-11.59	QP	
4	0.2244	30.90	11.14	42.04	52.65	-10.61	AVG	
5	0.4940	37.60	11.20	48.80	56.10	-7.30	QP	
6	0.4940	26.53	11.20	37.73	46.10	-8.37	AVG	
7	1.0660	25.96	11.22	37.18	46.00	-8.82	AVG	
8 *	1.0740	40.57	11.22	51.79	56.00	-4.21	QP	
9	3.4540	37.60	11.21	48.81	56.00	-7.19	QP	
10	3.4820	25.56	11.21	36.77	46.00	-9.23	AVG	
11	25.2580	17.78	11.59	29.37	50.00	-20.63	AVG	
12	25.7620	22.58	11.58	34.16	60.00	-25.84	QP	



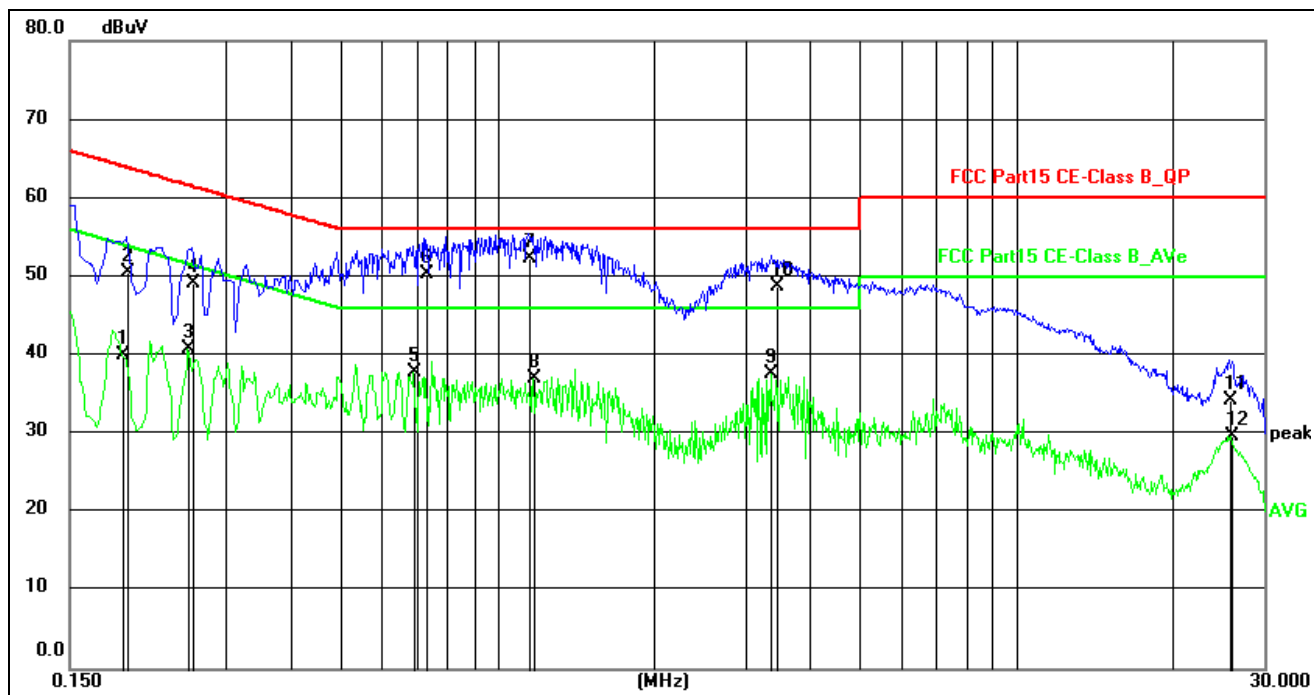
Site:	844LAB	Phase:	N	Temperature(C):	24(C)
Limit:	FCC Part15 CE-Class B_QP			Humidity(%):	63%
EUT:	Main Light	Test Time:	2024/7/5 18:36:12		
M/N.:	B04025301A	Power Rating:	AC120V/60Hz		
Mode:	Lighting	Test Engineer:			
Note:	Main Light				

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1780	41.44	11.16	52.60	64.58	-11.98	QP	
2	0.1780	32.01	11.16	43.17	54.58	-11.41	AVG	
3	0.2185	30.16	11.18	41.34	52.88	-11.54	AVG	
4	0.2260	40.04	11.19	51.23	62.60	-11.37	QP	
5	0.7260	25.88	11.26	37.14	46.00	-8.86	AVG	
6	0.7300	39.41	11.26	50.67	56.00	-5.33	QP	
7 *	1.1180	39.52	11.23	50.75	56.00	-5.25	QP	
8	1.1380	26.39	11.23	37.62	46.00	-8.38	AVG	
9	3.3060	27.64	11.16	38.80	46.00	-7.20	AVG	
10	3.3420	39.20	11.16	50.36	56.00	-5.64	QP	
11	25.1220	22.52	11.58	34.10	50.00	-15.90	AVG	
12	25.6259	27.66	11.57	39.23	60.00	-20.77	QP	



Site:	844LAB	Phase:	N	Temperature(C):	24(C)
Limit:	FCC Part15 CE-Class B_QP			Humidity(%):	63%
EUT:	Night Light	Test Time:	2024/7/5 18:41:50		
M/N.:	B04025301A	Power Rating:	AC120V/60Hz		
Mode:	Lighting	Test Engineer:			
Note:	Night Light				

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1780	41.48	11.16	52.64	64.58	-11.94	QP	
2	0.1835	31.39	11.16	42.55	54.33	-11.78	AVG	
3	0.2140	40.40	11.18	51.58	63.05	-11.47	QP	
4	0.2180	29.14	11.18	40.32	52.89	-12.57	AVG	
5	0.4940	37.56	11.31	48.87	56.10	-7.23	QP	
6	0.4980	27.01	11.31	38.32	46.03	-7.71	AVG	
7 *	1.0740	40.60	11.23	51.83	56.00	-4.17	QP	
8	1.1019	27.82	11.23	39.05	46.00	-6.95	AVG	
9	3.4220	25.07	11.15	36.22	46.00	-9.78	AVG	
10	3.4980	38.86	11.15	50.01	56.00	-5.99	QP	
11	24.1620	23.12	11.57	34.69	50.00	-15.31	AVG	
12	24.6980	27.41	11.58	38.99	60.00	-21.01	QP	



Site:	844LAB	Phase:	L1	Temperature(C):	24(C)
Limit:	FCC Part15 CE-Class B_QP			Humidity(%):	63%
EUT:	Night Light	Test Time:	2024/7/5 18:46:03		
M/N.:	B04025301A	Power Rating:	AC120V/60Hz		
Mode:	Lighting	Test Engineer:			
Note:	Night Light				

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1900	28.79	11.14	39.93	54.04	-14.11	AVG	
2	0.1940	39.36	11.14	50.50	63.86	-13.36	QP	
3	0.2540	29.59	11.15	40.74	51.63	-10.89	AVG	
4	0.2580	37.96	11.15	49.11	61.50	-12.39	QP	
5	0.6900	26.56	11.24	37.80	46.00	-8.20	AVG	
6	0.7300	39.17	11.25	50.42	56.00	-5.58	QP	
7 *	1.1500	41.04	11.22	52.26	56.00	-3.74	QP	
8	1.1740	25.82	11.23	37.05	46.00	-8.95	AVG	
9	3.3740	26.44	11.22	37.66	46.00	-8.34	AVG	
10	3.4540	37.49	11.21	48.70	56.00	-7.30	QP	
11	25.7820	22.64	11.58	34.22	60.00	-25.78	QP	
12	25.9660	18.06	11.58	29.64	50.00	-20.36	AVG	

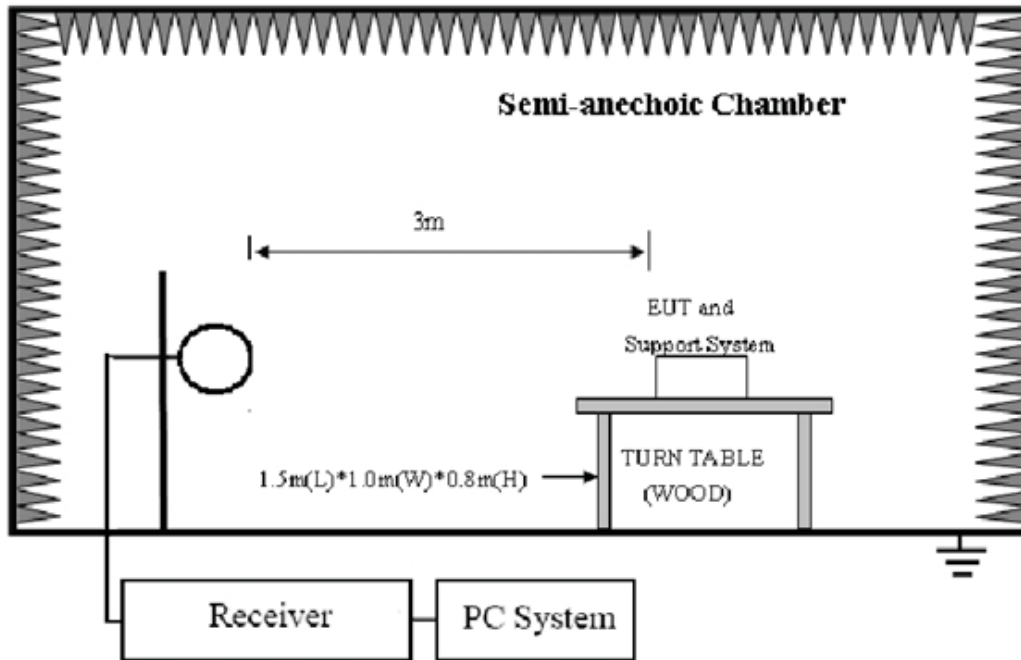
4. Radiated emission test

4.1. Test equipment

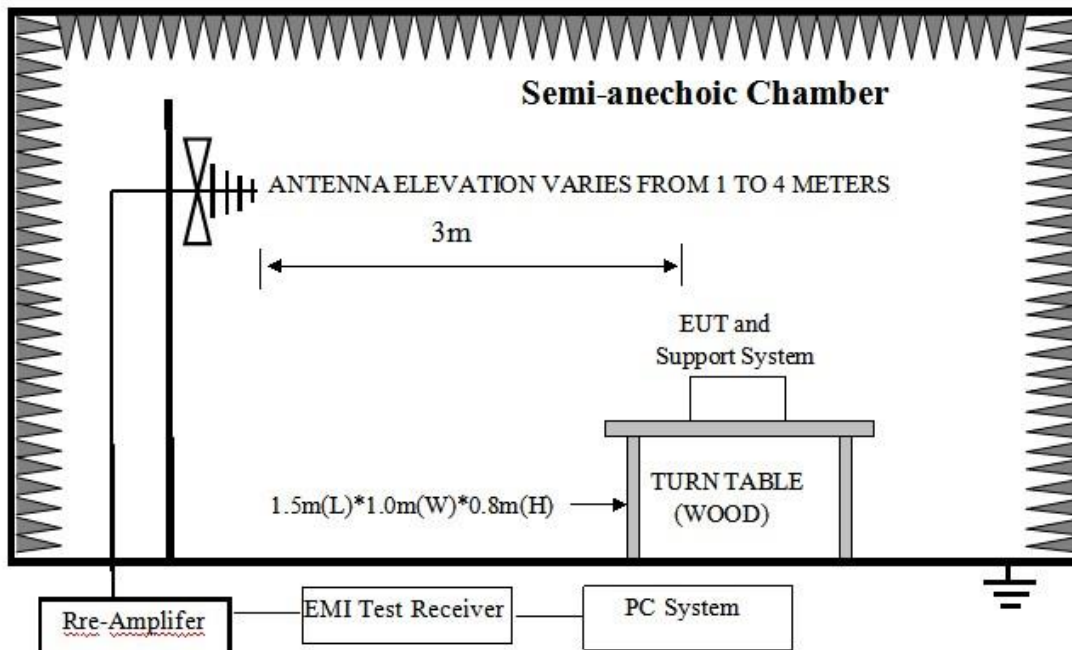
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESR	7250-30406 7528	2024-05-14	1Year
2	Trilog Broadband Antenna	Schwarzbeck	VULB9168	00969	2023-05-19	2 Year
3	Horn antenna	Schwarzbeck	BBHA9120D	453	2023-05-19	2Year
4	Pre-amplifier	Agilent	8449B	3008A04721	2024-05-14	1Year
5	Double Ridged Horn Antenna	A.H. System	SAS-574	584	2024-05-14	1Year
6	Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	2024-05-14	1Year
7	Pre-amplifier	R&S	8447F	3113A04553	2024-05-14	1Year
8	RF Cable	GORE	OSQ01Q010 78.7	SN1545847 3	2023-05-19	2Year
9	RF Cable	ESCO	ETS-LINGR EN	RFC-SMS-1 00-SMS-340 -IN	2023-05-19	2Year
10	Measurement software	Farad	EZ-EMC(VE R:1.1.4.2)	N/A	N/A	N/A

4.2. Block diagram of test setup

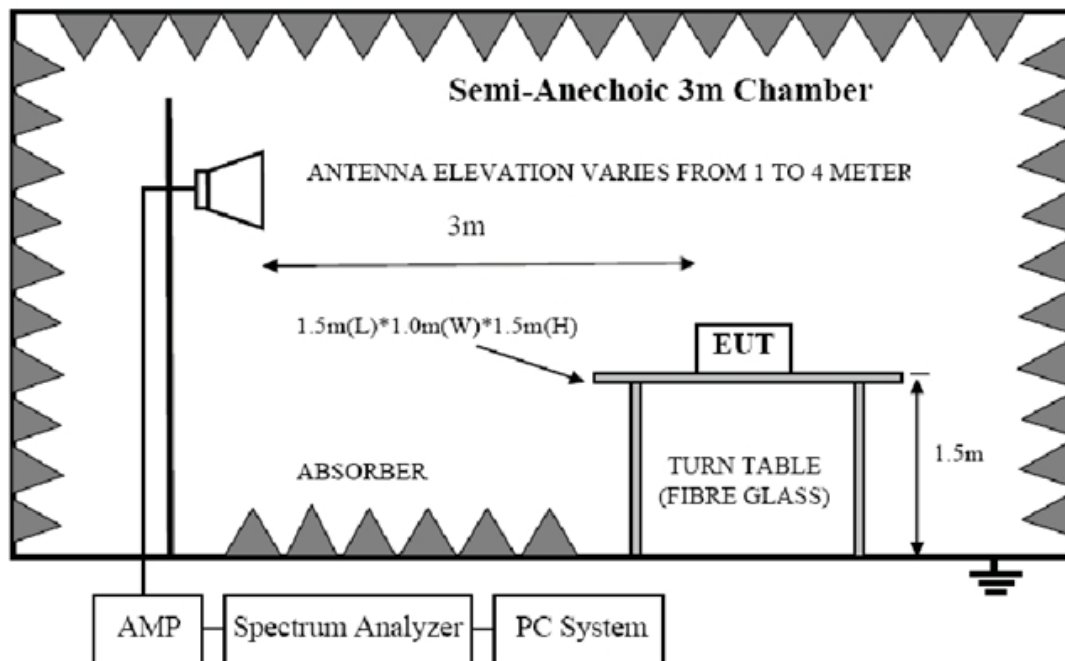
In 3m Anechoic Chamber Test Setup Diagram for 9KHz to 30MHz:



In 3m Anechoic Chamber Test Setup Diagram for 30MHz to 1GHz:



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz:



4.3. Limit

FCC 15.205 Restricted frequency band:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(³)

FCC 15.209 and rss-gen table 4 Limit

Frequency (MHz)	Distance (Meters)	Field Strengths Limits dB(μV)/m
30--88	3	40.0
88--216	3	43.5
216--960	3	46.0
960--1000	3	54.0
Above 1GHz	3	Peak: 74.0
	3	Average: 54.0

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

(2) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(3) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(4) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dBuV/m}) = \text{Limit}_{30\text{m}}(\text{dBuV/m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(5) All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

4.4. Test Procedure

Procedure of Preliminary Test

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 4.2 of this report.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

EUT height should be 0.8m for below 1GHz and 1.5m for above 1GHz at ground with absorbers.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 25GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The X, Y, Z three axial are tested and the report only the worst case.

The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW:

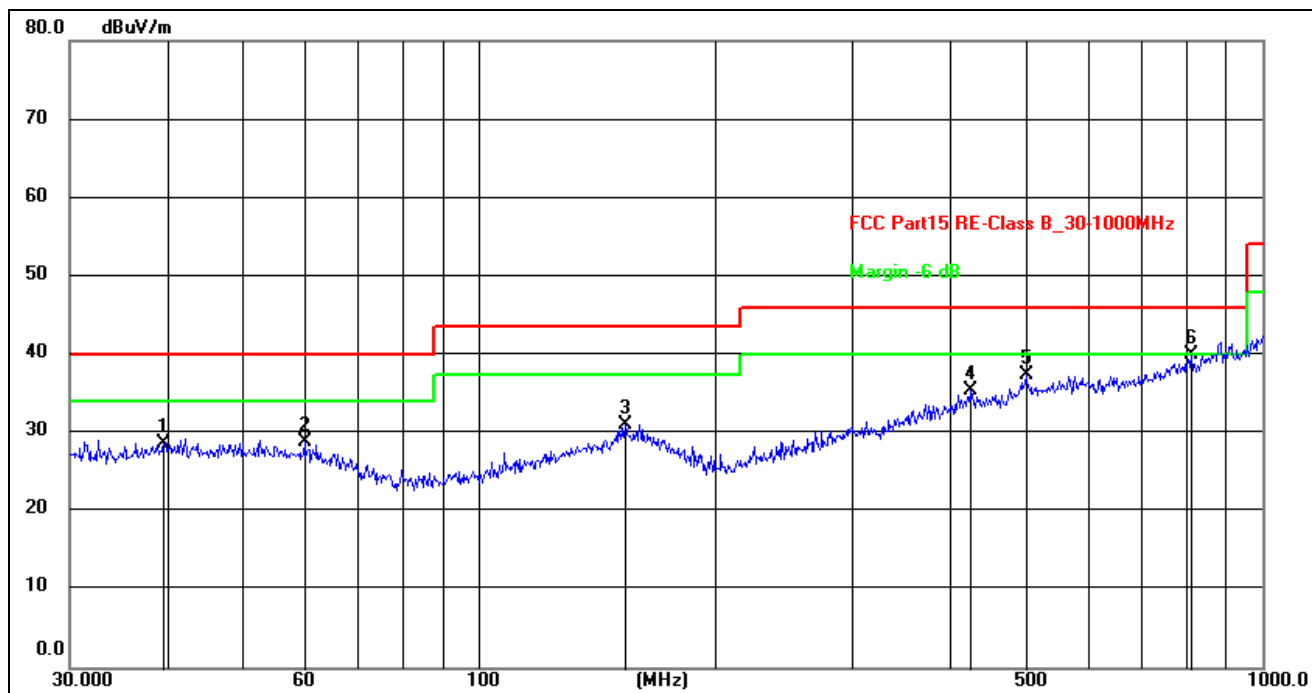
Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure.

4.5. Test result

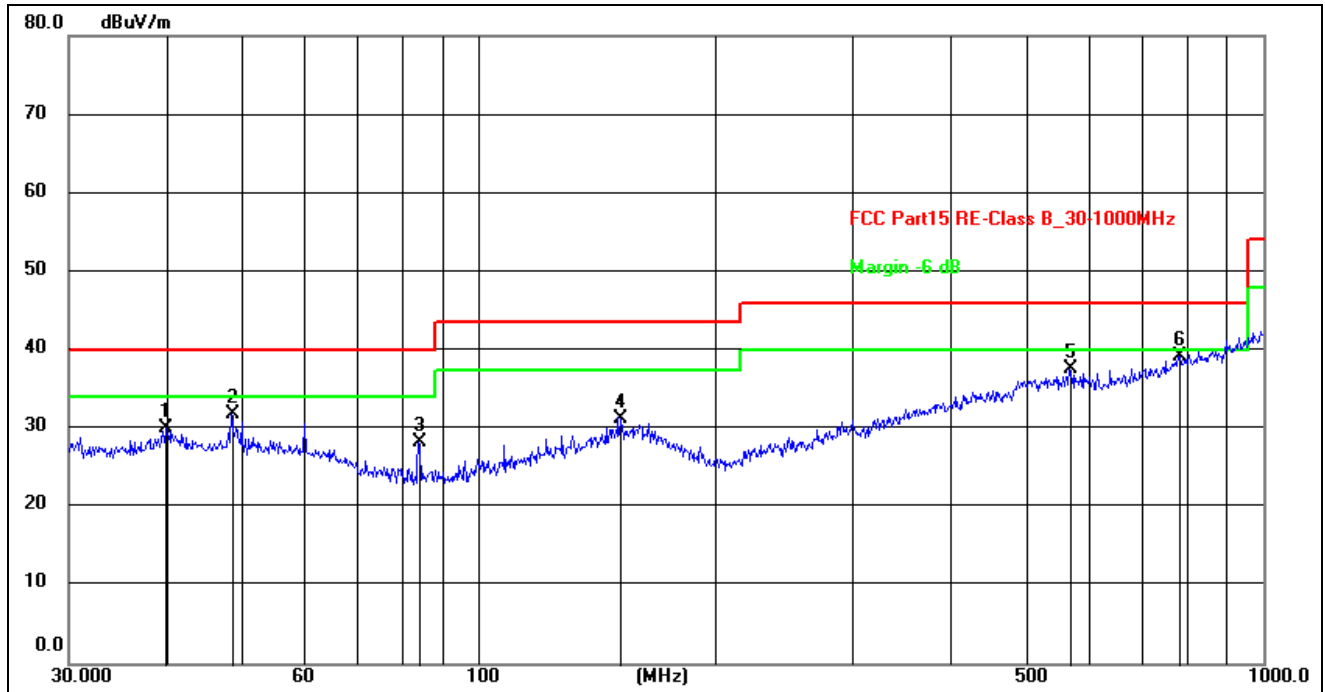
PASS. (See below detailed test result)

9K-30MHz: Emission detected are more than 20dB below the limit line.



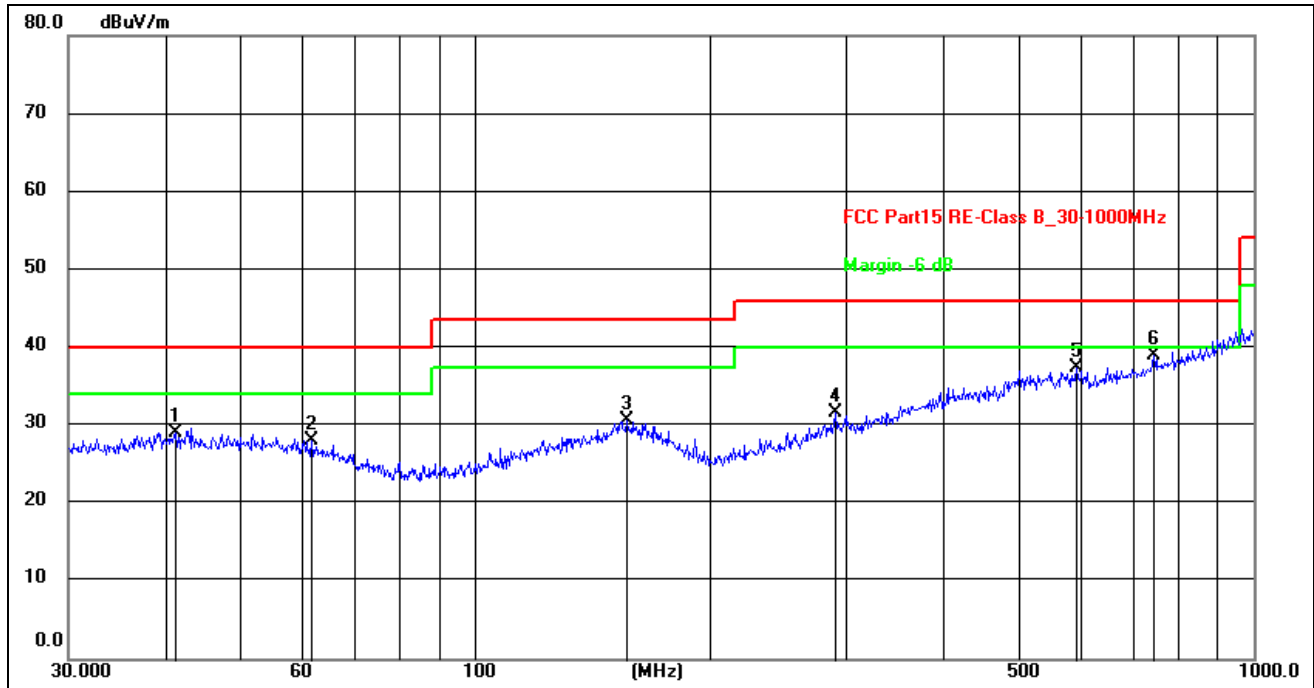
Site:	966LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_30-1000MHz		Humidity(%):60%
EUT:	LED	Test Time:	2024/7/16 17:36:05
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:	Main Light		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	39.5757	13.99	14.77	28.76	40.00	-11.24	peak	200	191	
2	59.8588	15.34	13.63	28.97	40.00	-11.03	peak	200	267	
3	153.7385	15.68	15.45	31.13	43.50	-12.37	peak	100	163	
4	423.5402	18.11	17.40	35.51	46.00	-10.49	peak	100	107	
5	499.4246	18.59	18.81	37.40	46.00	-8.60	peak	100	218	
6 *	813.1115	16.13	23.83	39.96	46.00	-6.04	peak	100	355	



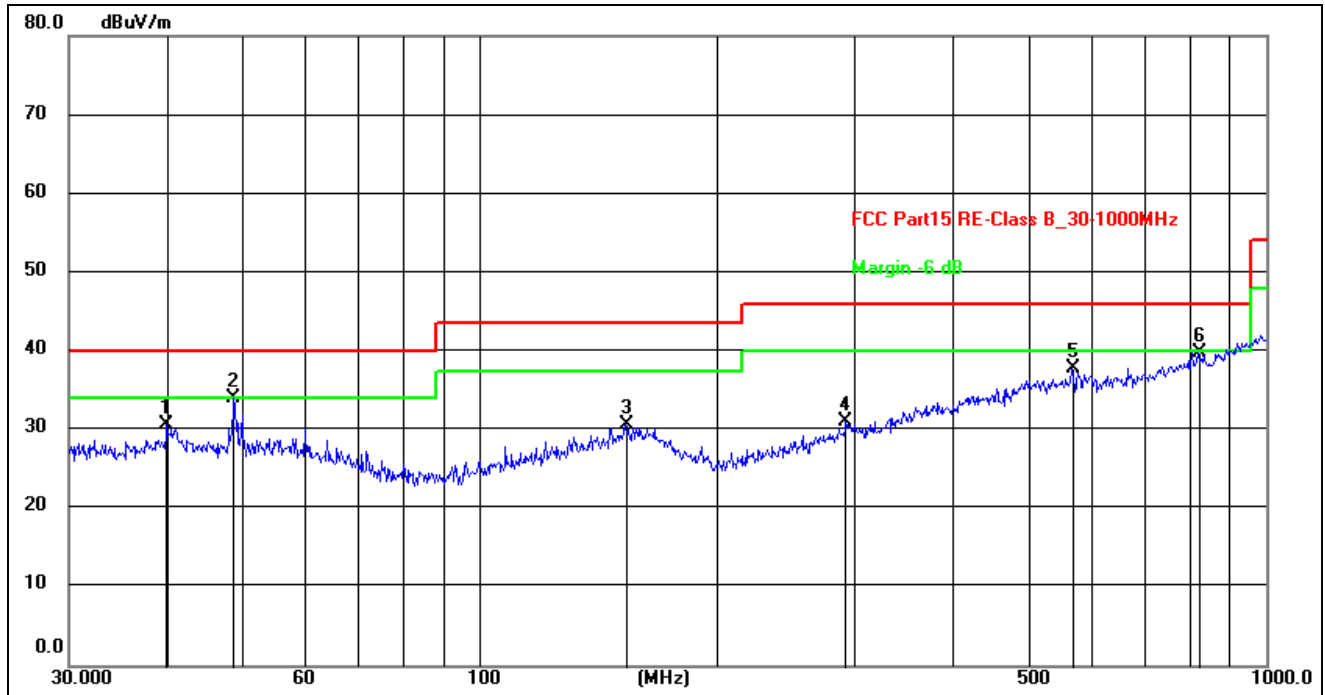
Site:	966LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_30-1000MHz		Humidity(%):60%
EUT:	LED	Test Time:	2024/7/16 17:38:42
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:	Main Light		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	39.8542	15.32	14.81	30.13	40.00	-9.87	peak	100	196	
2	48.3318	17.50	14.37	31.87	40.00	-8.13	peak	200	308	
3	83.8156	17.97	10.36	28.33	40.00	-11.67	peak	100	4	
4	151.5972	15.84	15.45	31.29	43.50	-12.21	peak	200	347	
5	566.6223	17.45	20.15	37.60	46.00	-8.40	peak	200	128	
6 *	782.3453	15.61	23.56	39.17	46.00	-6.83	peak	200	164	



Site:	966LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_30-1000MHz		Humidity(%):60%
EUT:	LED	Test Time:	2024/7/16 17:44:37
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:	Night Light		

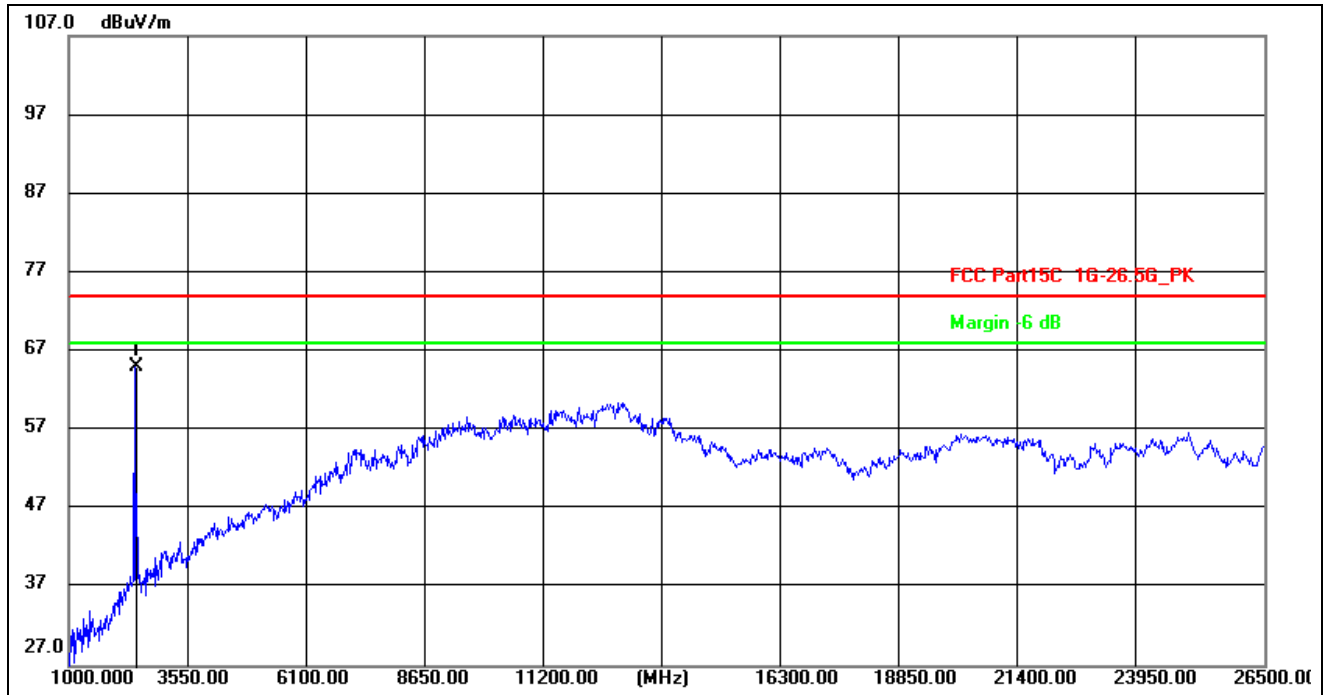
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	41.2765	14.41	14.73	29.14	40.00	-10.86	peak	200	64	
2	61.5618	14.84	13.33	28.17	40.00	-11.83	peak	200	321	
3	156.4577	15.24	15.46	30.70	43.50	-12.80	peak	200	276	
4	290.0172	17.40	14.30	31.70	46.00	-14.30	peak	200	136	
5	593.0496	16.61	20.73	37.34	46.00	-8.66	peak	200	208	
6 *	744.8660	15.97	23.06	39.03	46.00	-6.97	peak	200	8	



Site:	966LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15 RE-Class B_30-1000MHz		Humidity(%):60%
EUT:	LED	Test Time:	2024/7/16 17:47:14
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:	Night Light		

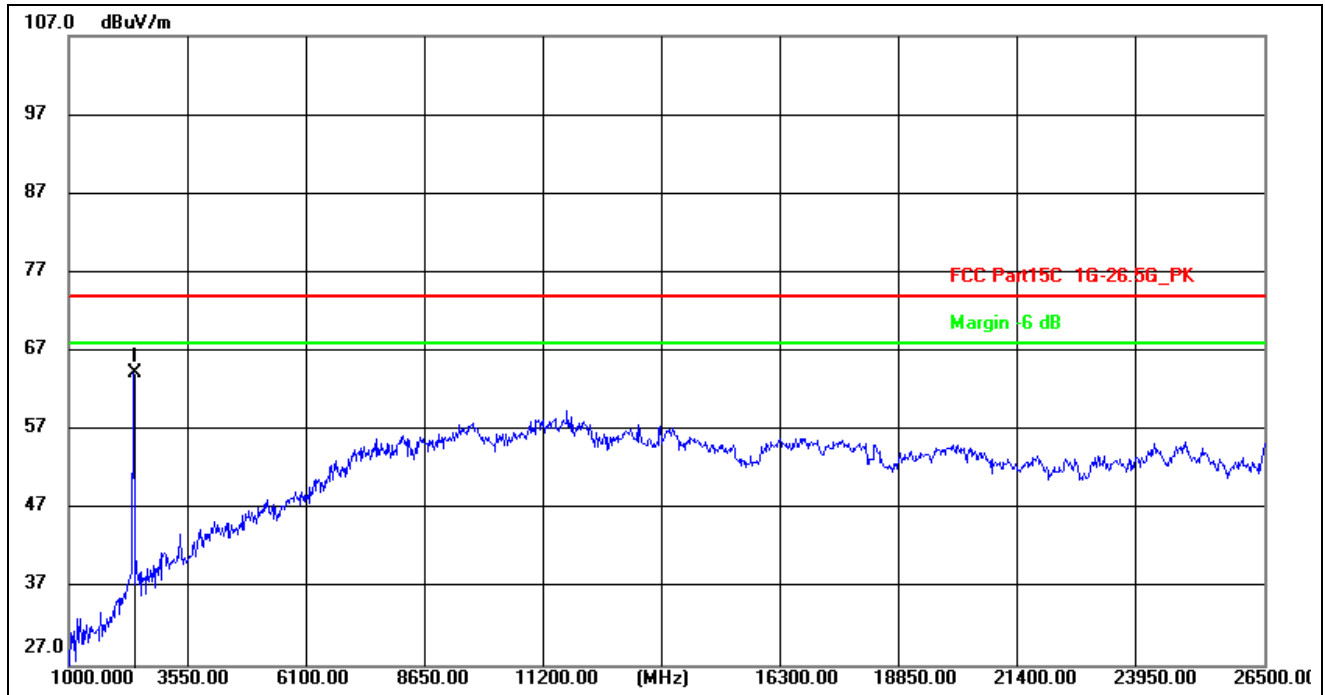
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	39.9942	15.87	14.83	30.70	40.00	-9.30	peak	200	20	
2 *	48.6719	19.69	14.36	34.05	40.00	-5.95	peak	200	224	
3	153.2004	15.31	15.45	30.76	43.50	-12.74	peak	200	272	
4	292.0583	16.78	14.36	31.14	46.00	-14.86	peak	200	168	
5	566.6223	17.67	20.15	37.82	46.00	-8.18	peak	200	72	
6	818.8341	15.98	23.87	39.85	46.00	-6.15	peak	100	234	

**For 1GHz to 26.5GHz:
GFSK Mode (above 1GHz)**



Site:	966LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15C 1G-26.5G_PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/9/9 20:32:27
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

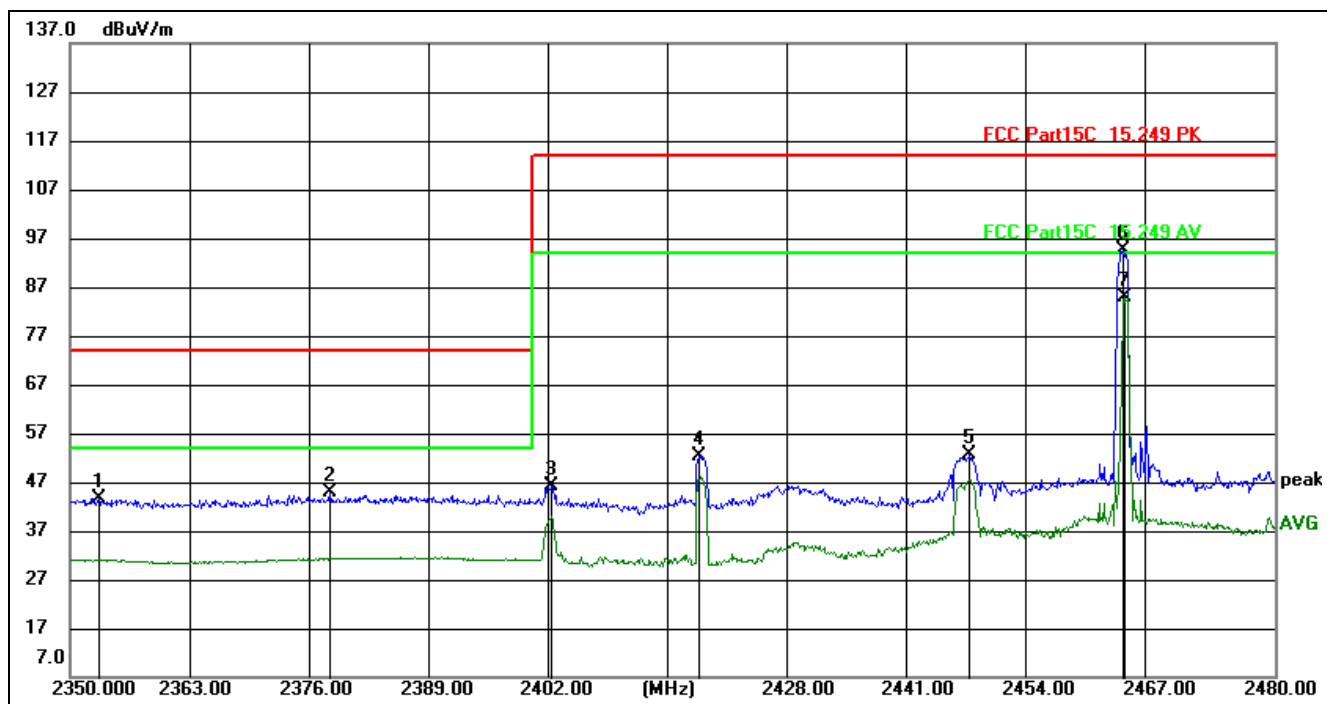
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1 *	2453.500	80.86	-15.76	65.10	74.00	-8.90	peak			



Site:	966LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15C 1G-26.5G_PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/9/9 20:37:34
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

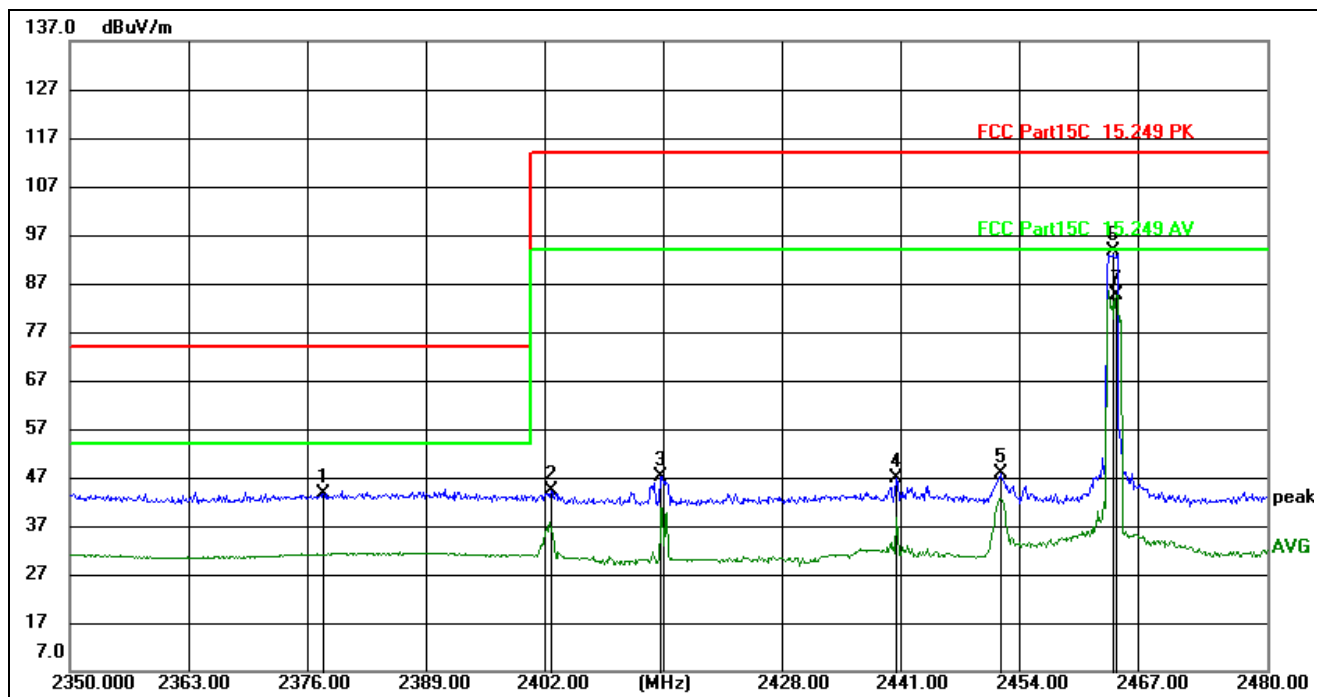
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1 *	2464.000	79.98	-15.76	64.22	74.00	-9.78	peak			

Test plots for band-edge



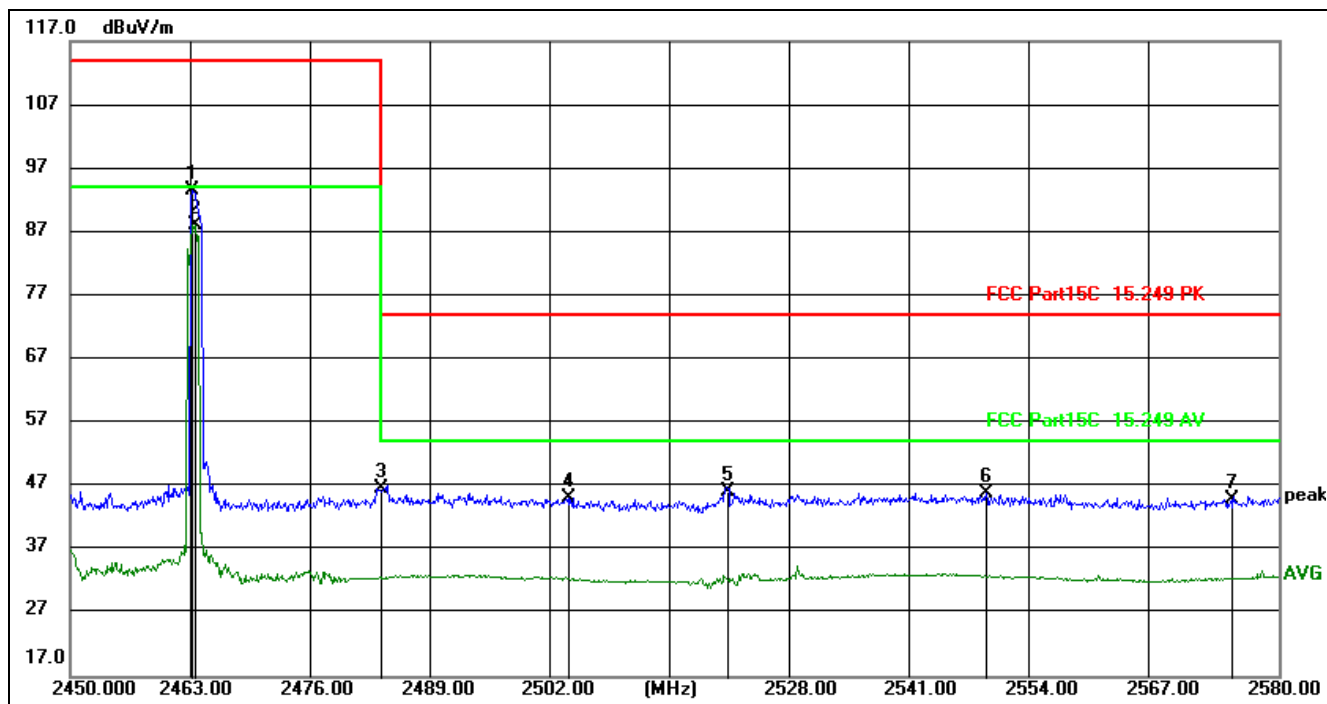
Site:	966 LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15C 15.249 PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/12/13 14:20:34
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2353.120	59.30	-15.72	43.58	74.00	-30.42	peak	200	153	
2	2378.080	60.51	-15.73	44.78	74.00	-29.22	peak	200	360	
3	2402.000	62.08	-15.76	46.32	114.00	-67.68	peak	200	243	
4	2417.860	68.14	-15.75	52.39	114.00	-61.61	peak	200	303	
5	2447.110	68.32	-15.76	52.56	114.00	-61.44	peak	200	33	
6	2463.620	110.20	-15.73	94.47	114.00	-19.53	peak	200	3	
7 *	2463.880	100.54	-15.73	84.81	94.00	-9.19	AVG	300	356	



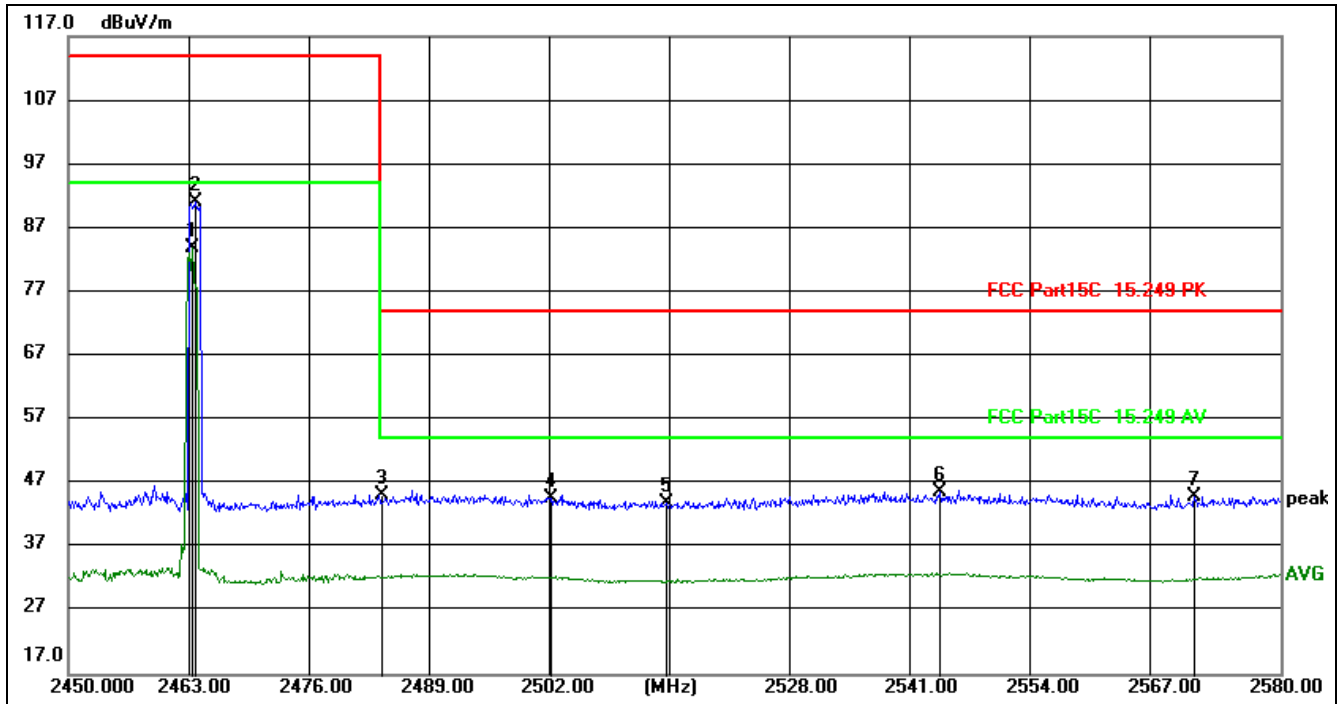
Site:	966 LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15C 15.249 PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/12/13 14:24:46
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2377.560	59.37	-15.73	43.64	74.00	-30.36	peak	200	117	
2	2402.260	59.99	-15.76	44.23	114.00	-69.77	peak	200	85	
3	2414.090	63.04	-15.75	47.29	114.00	-66.71	peak	100	4	
4	2439.830	62.57	-15.77	46.80	114.00	-67.20	peak	100	122	
5	2451.140	63.49	-15.77	47.72	114.00	-66.28	peak	100	93	
6	2463.360	109.28	-15.73	93.55	114.00	-20.45	peak	200	206	
7 *	2463.620	100.40	-15.73	84.67	94.00	-9.33	AVG	200	206	



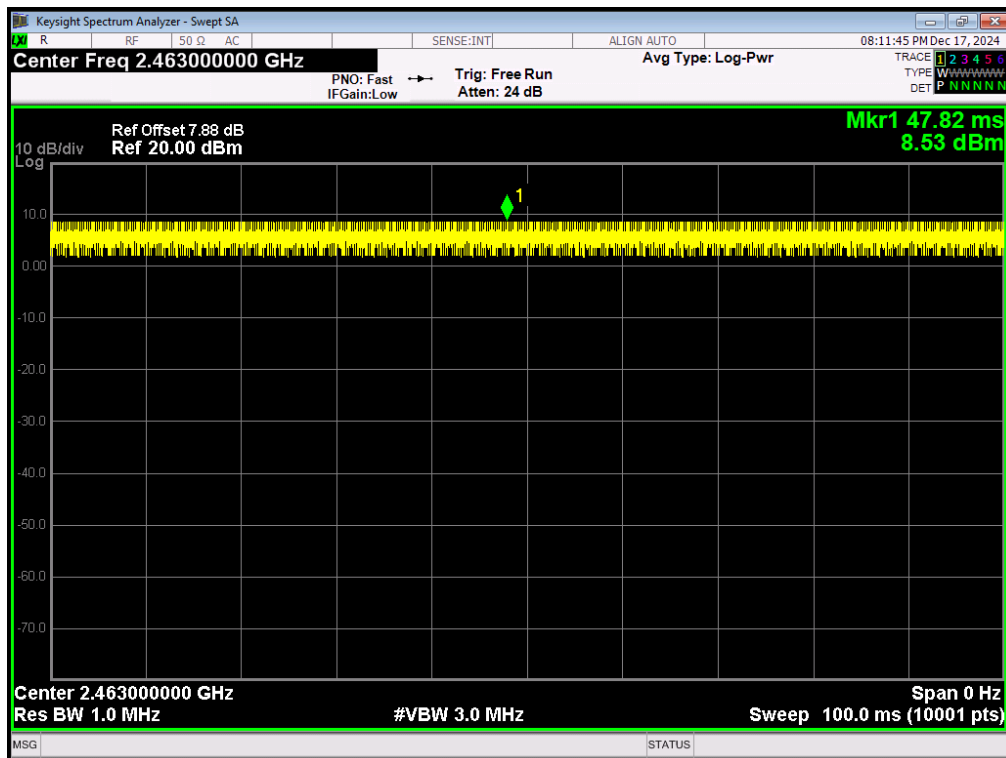
Site:	966 LAB	Antenna::Horizontal	Temperature(C):24(C)
Limit:	FCC Part15C 15.249 PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/12/16 11:41:10
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	2463.130	109.29	-15.73	93.56	114.00	-20.44	peak	100	86	
2 *	2463.520	103.93	-15.73	88.20	94.00	-5.80	AVG	100	86	
3	2483.520	62.29	-15.65	46.64	74.00	-27.36	peak	100	326	
4	2503.560	60.84	-15.56	45.28	74.00	-28.72	peak	100	295	
5	2520.720	61.73	-15.49	46.24	74.00	-27.76	peak	200	63	
6	2548.540	61.24	-15.36	45.88	74.00	-28.12	peak	300	57	
7	2574.930	60.05	-15.20	44.85	74.00	-29.15	peak	200	213	



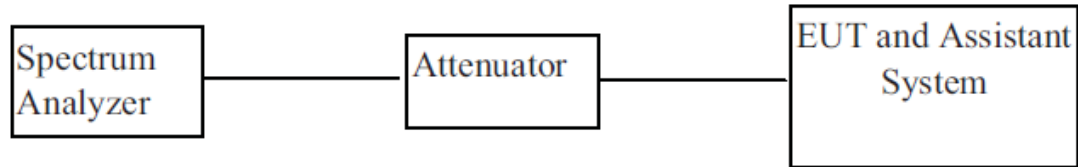
Site:	966 LAB	Antenna::Vertical	Temperature(C):24(C)
Limit:	FCC Part15C 15.249 PK		Humidity(%):60%
EUT:	LED	Test Time:	2024/12/16 11:45:27
M/N.:	B04025301A	Power Rating:	AC 120V/60Hz
Mode:	Lighting	Test Engineer:	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1 *	2463.260	99.65	-15.73	83.92	94.00	-10.08	AVG	200	57	
2	2463.650	106.88	-15.73	91.15	114.00	-22.85	peak	300	33	
3	2483.580	60.76	-15.65	45.11	74.00	-28.89	peak	200	57	
4	2501.740	60.35	-15.58	44.77	74.00	-29.23	peak	300	301	
5	2514.220	59.38	-15.52	43.86	74.00	-30.14	peak	100	152	
6	2543.470	61.10	-15.39	45.71	74.00	-28.29	peak	300	4	
7	2570.770	60.13	-15.23	44.90	74.00	-29.10	peak	300	213	



5. Output Power

5.1. BLOCK DIAGRAM OF TEST SETUP



5.2. Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt (30dBm).

5.3. Test Procedure

For output power test:

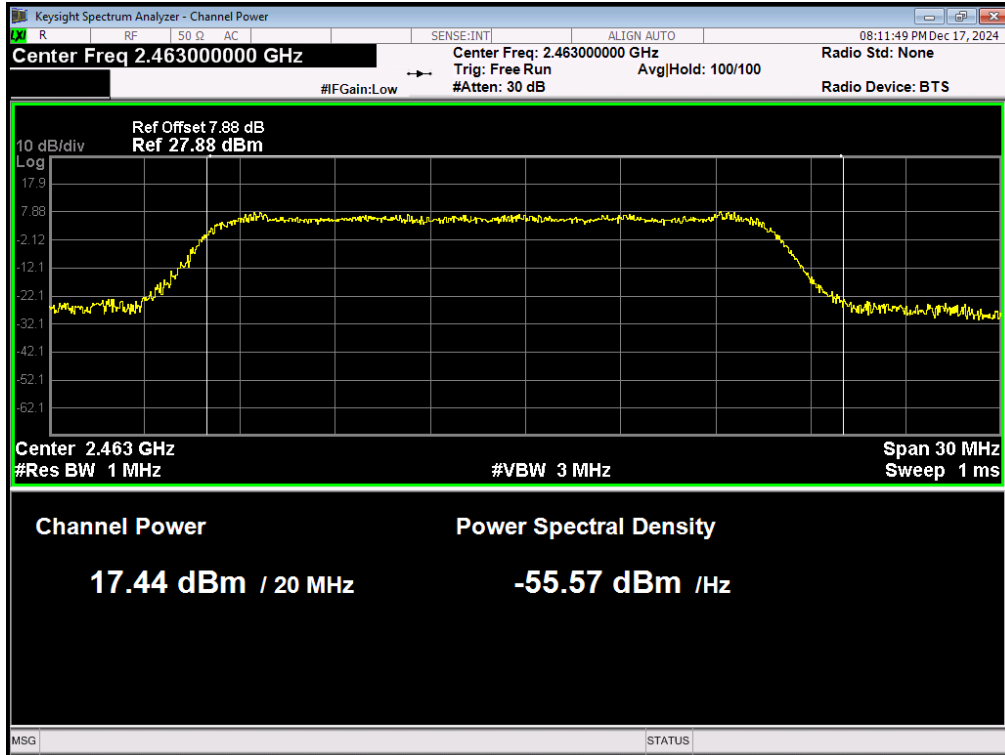
1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to KDB 558074v03r04 for compliance to FCC 47CFR 15.247 requirements.

5.4. Test result

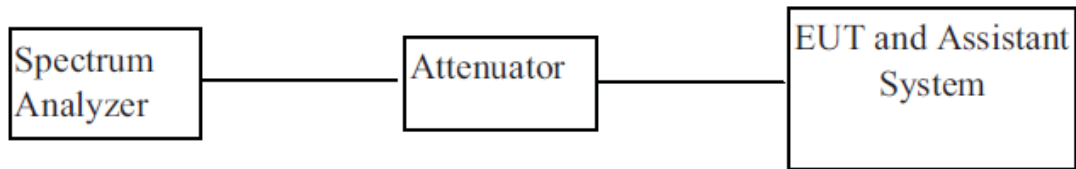
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	GFSK	2463	Ant 1	17.439	0	17.439	30	Pass

Power NVNT GFSK 2463MHz Ant1



6. -6dB Bandwidth

6.1. BLOCK DIAGRAM OF TEST SETUP



6.2. Limit

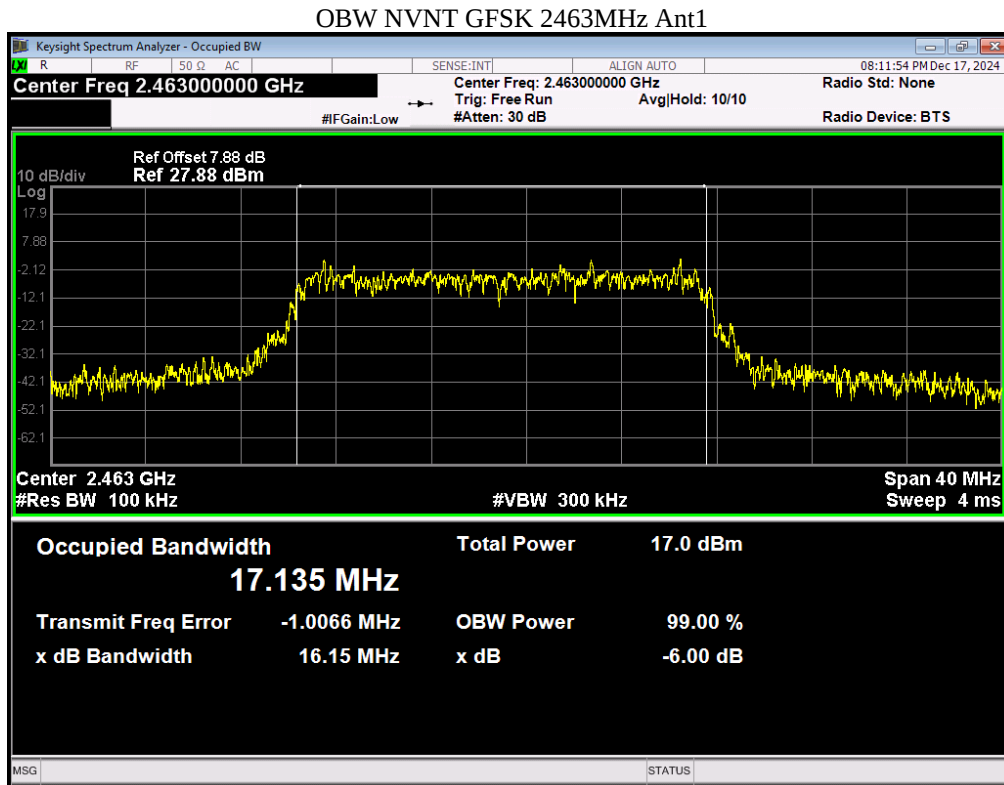
Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.3. Test Procedure

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq$ 3 $\times$ RBW.
 4. Set SPA Trace 1 Max hold, then View.
- Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

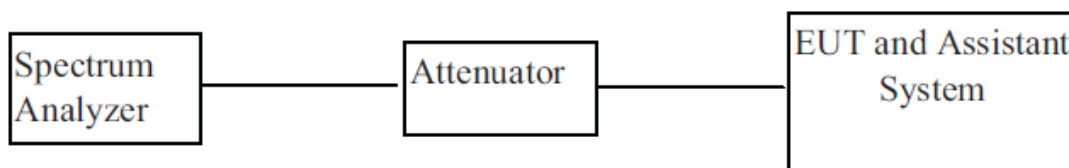
6.4. Test result

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	GFSK	2463	Ant 1	17.1353	16.1462	0.5	Pass



7. Band Edges Measurement

7.1. BLOCK DIAGRAM OF TEST SETUP



7.2. Limit

Below -30dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.3. Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable.

Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.

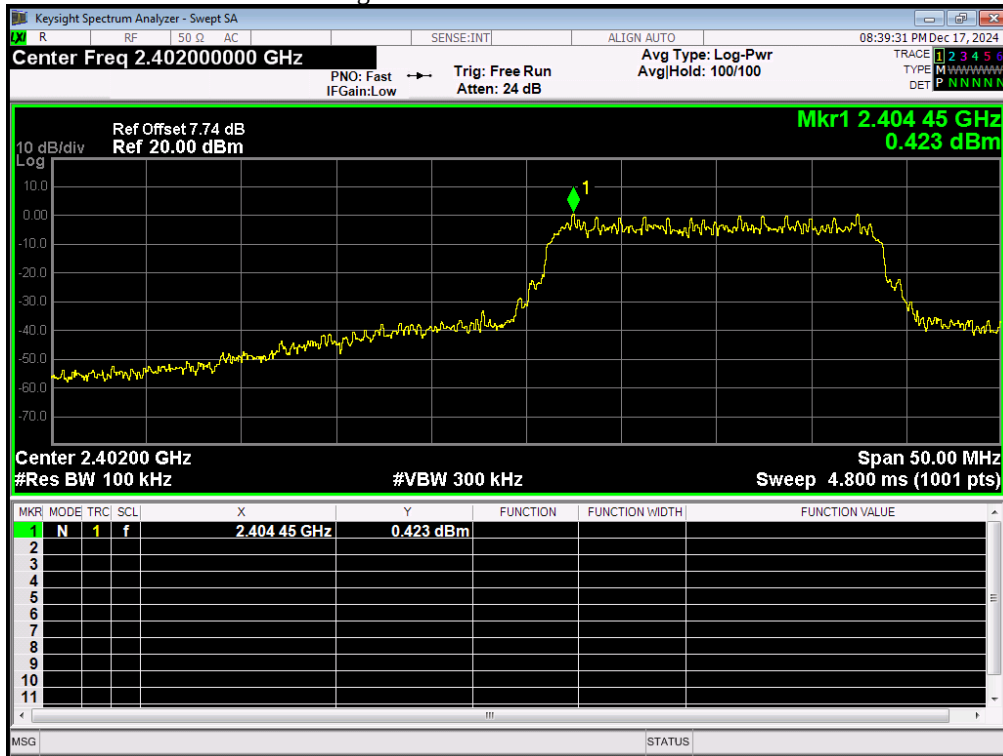
Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 30dB relative to the maximum measured in-band peak PSD level.

The band edges was measured and recorded.

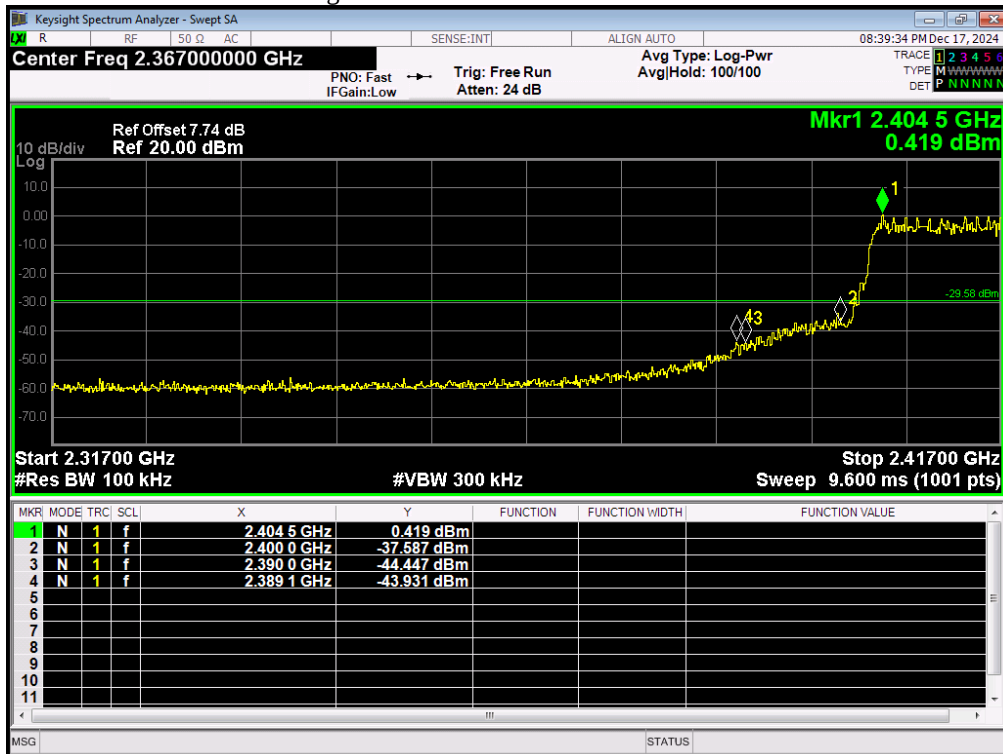
7.4. Test result

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	GFSK	2402	Ant 1	-44.353	-30	Pass
NVNT	GFSK	2463	Ant 1	-42.993	-30	Pass

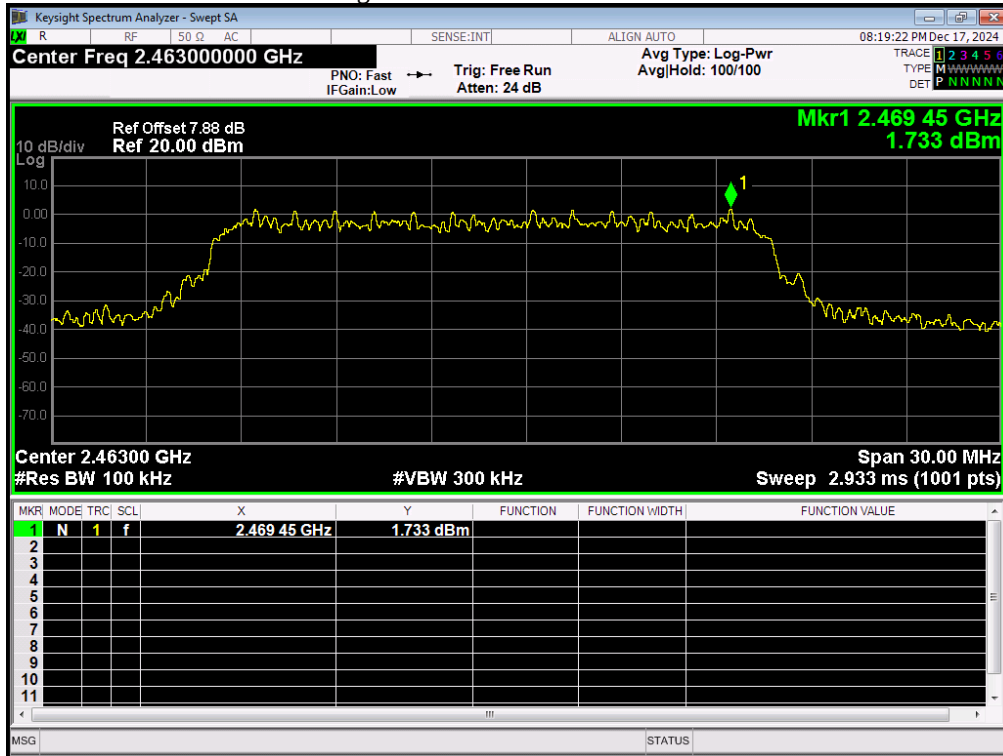
Band Edge NVNT GFSK 2402MHz Ant1 Ref



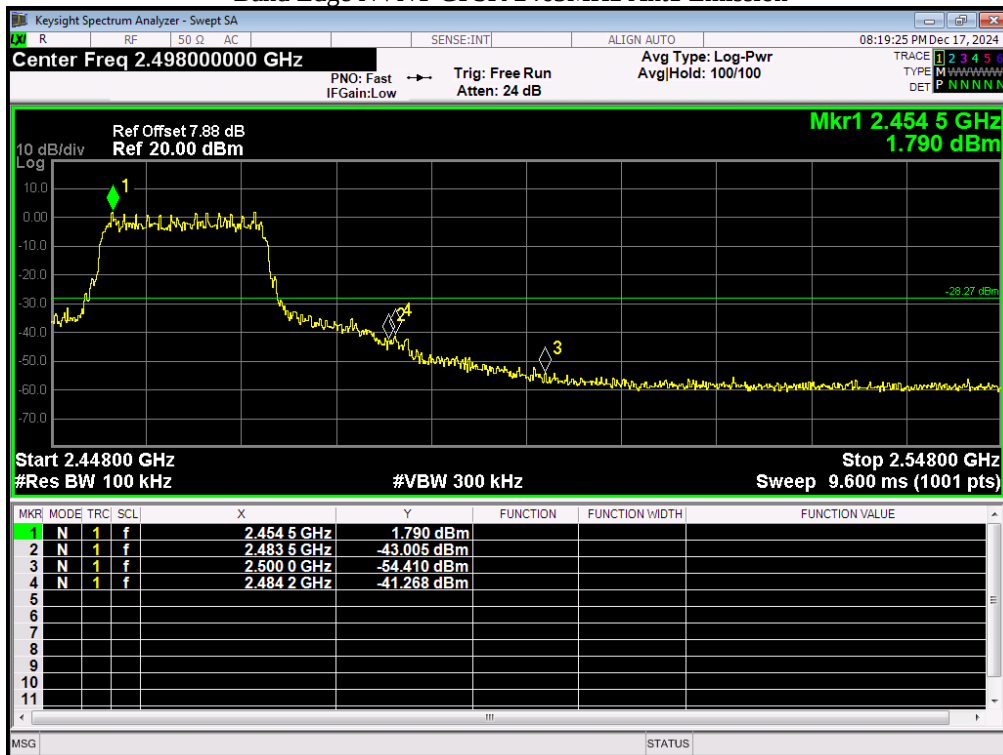
Band Edge NVNT GFSK 2402MHz Ant1 Emission



Band Edge NVNT GFSK 2463MHz Ant1 Ref

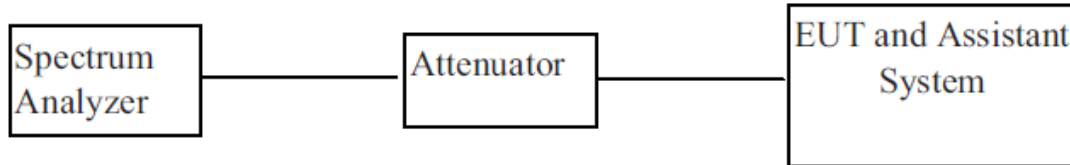


Band Edge NVNT GFSK 2463MHz Ant1 Emission



8. Conducted Spurious Emission

8.1. BLOCK DIAGRAM OF TEST SETUP



8.2. Limit

In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.

In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a)

8.3. Test Procedure

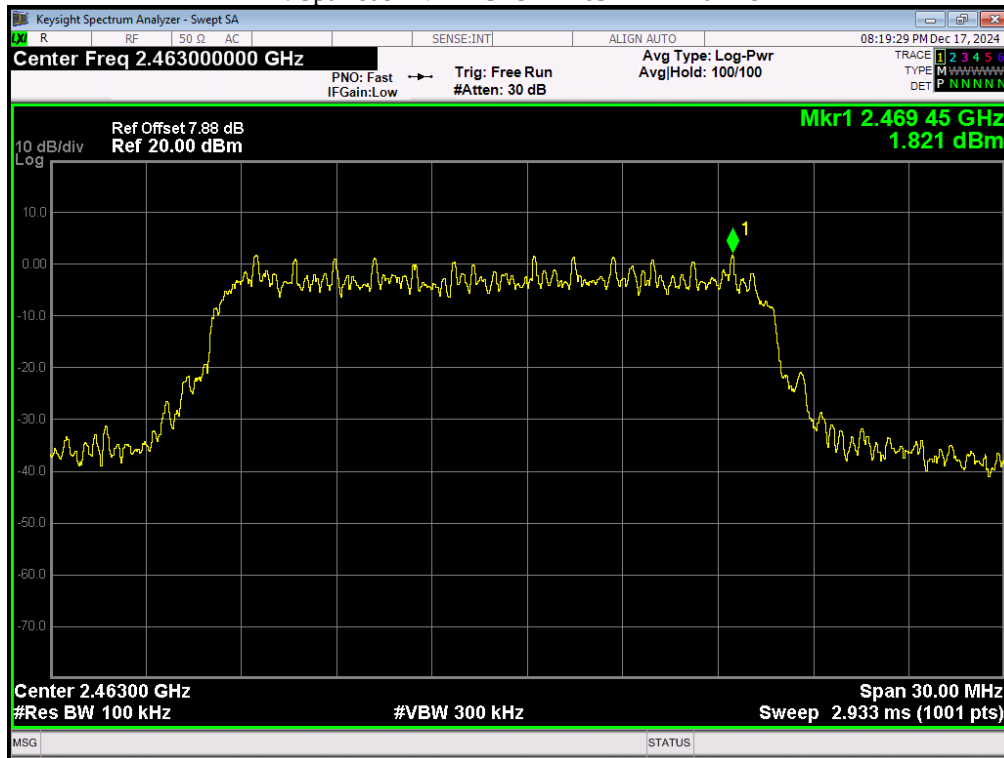
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW > RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW > RBW) are conform to the requirement.

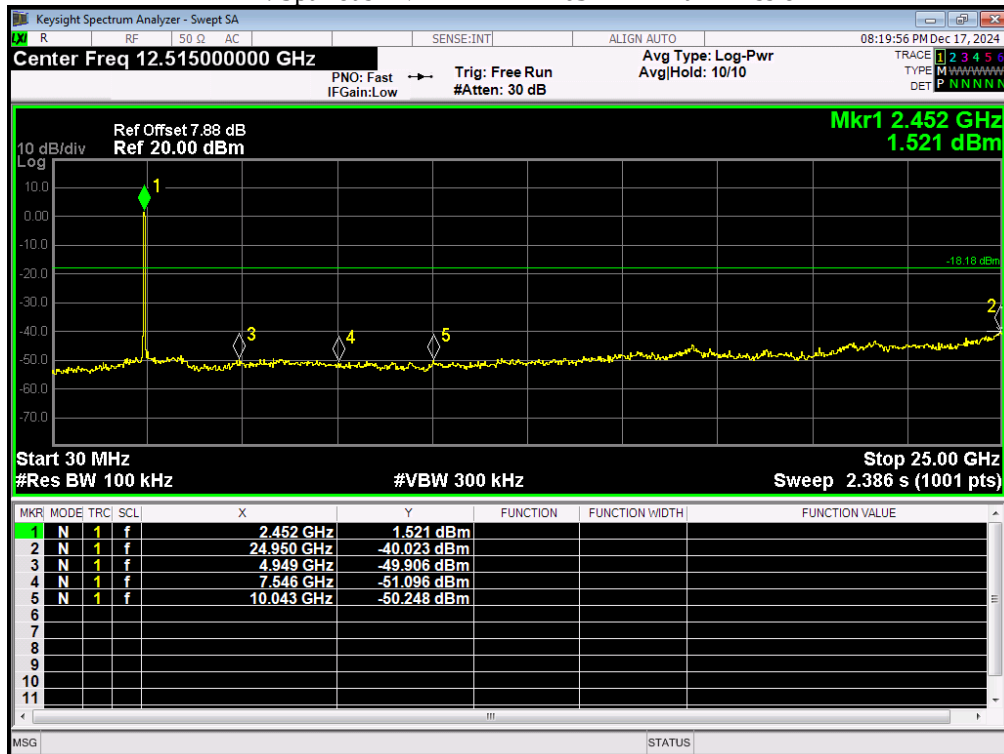
8.4. Test result

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	GFSK	2463	Ant 1	-41.841	-30	Pass

Tx. Spurious NVNT GFSK 2463MHz Ant1 Ref

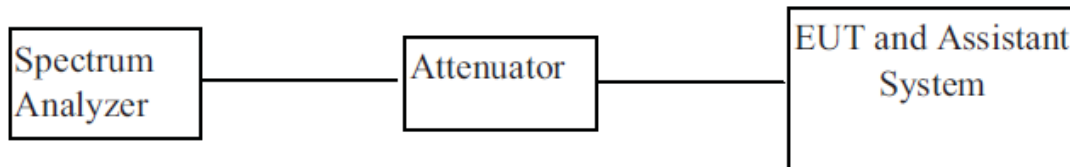


Tx. Spurious NVNT GFSK 2463MHz Ant1 Emission



9. Conducted Output Power Spectral Density

9.1. Block diagram of test setup



9.2. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

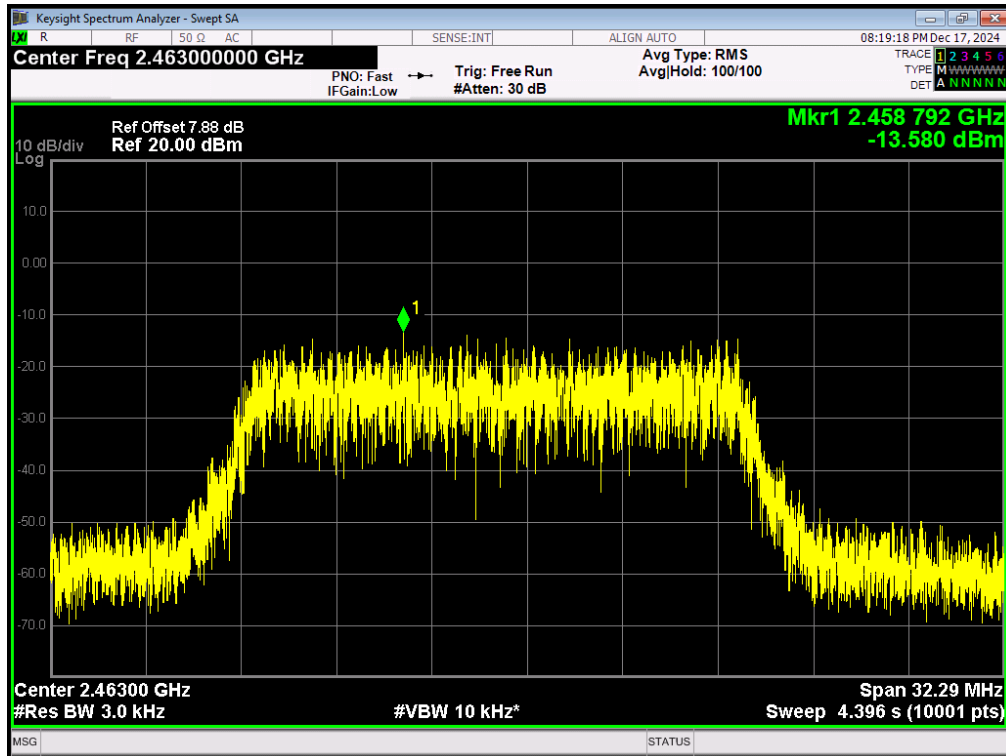
9.3. Test Procedure

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set SPA Trace 1 Max hold, then View.

9.4. Test result

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	GFSK	2463	Ant 1	-13.58	8	Pass

PSD NVNT GFSK 2463MHz Ant1



10. Antenna Requirement

10.1. Standard requirement

15.203 requirement: For intentional device, according to 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.

15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

10.2. EUT Antenna

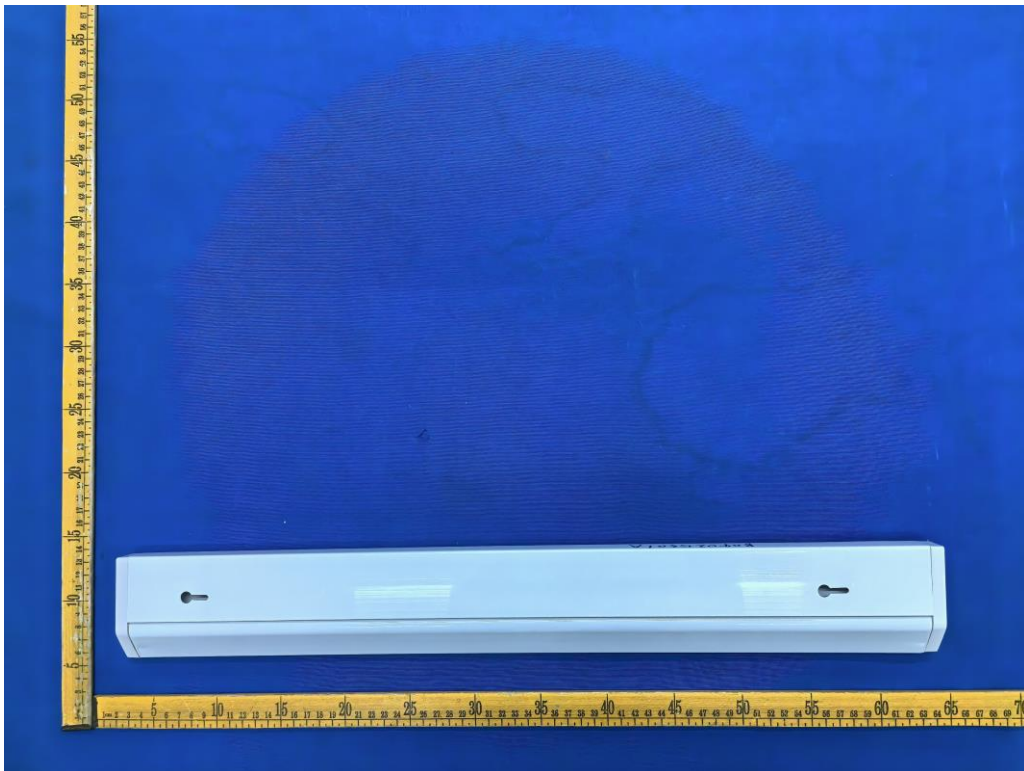
The antenna is Integral Antenna and no consideration of replacement. Antenna gain is Maximum 0.00dBi from 2.4GHz to 2.5GHz.

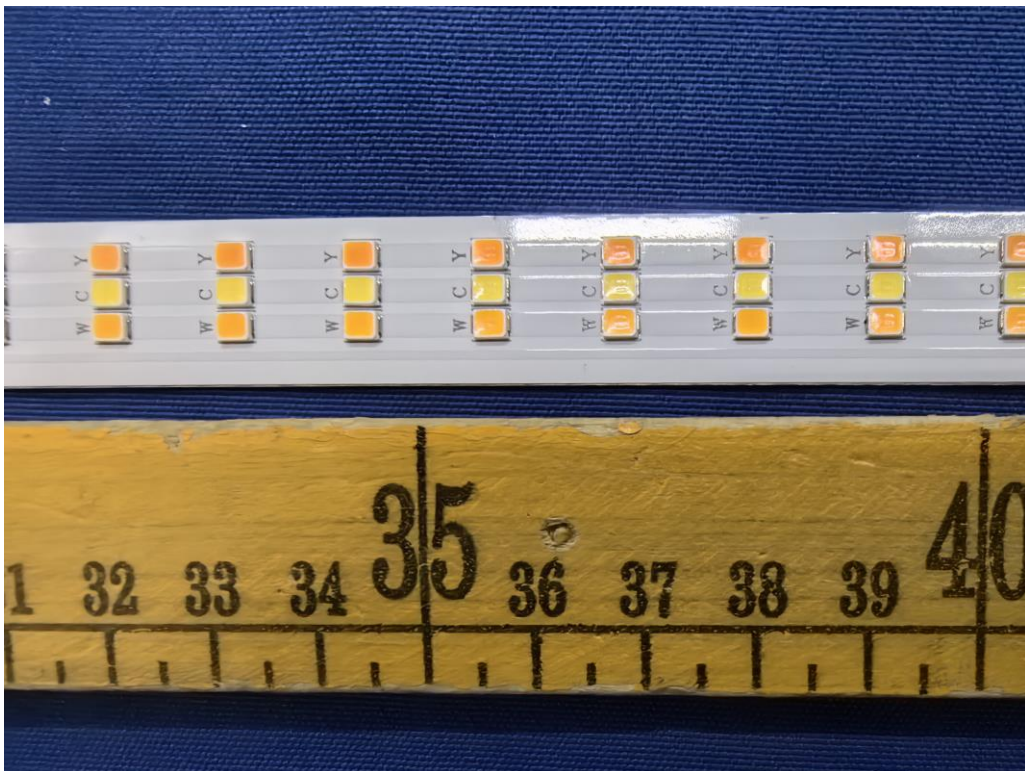
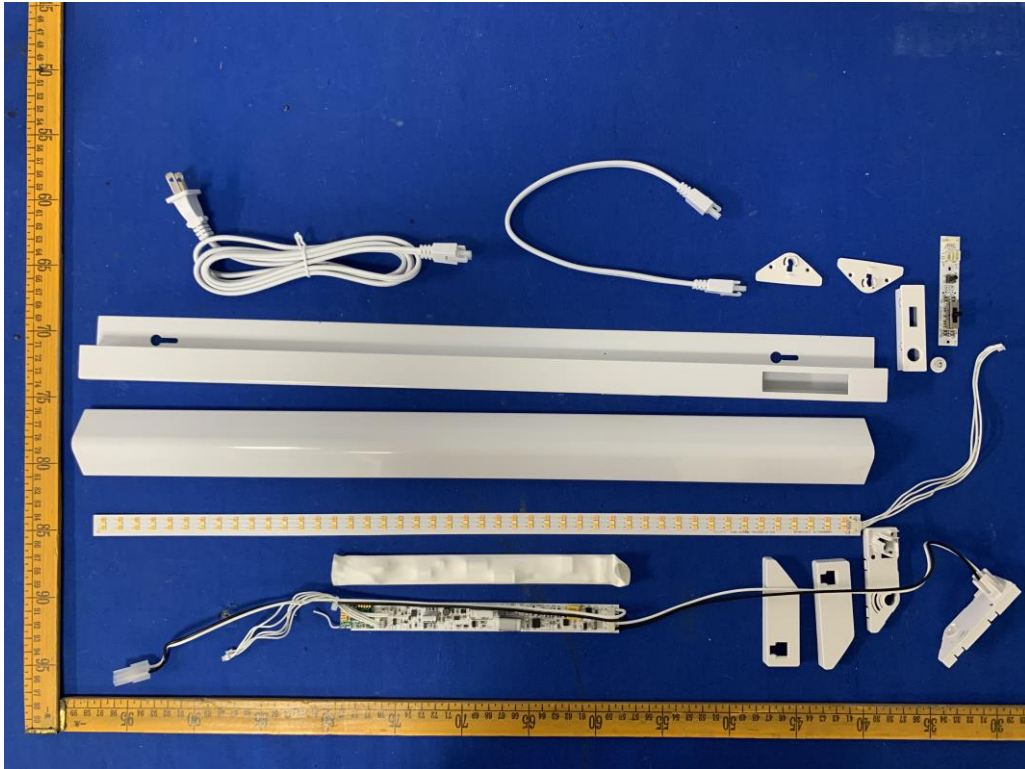
11. Test setup photograph

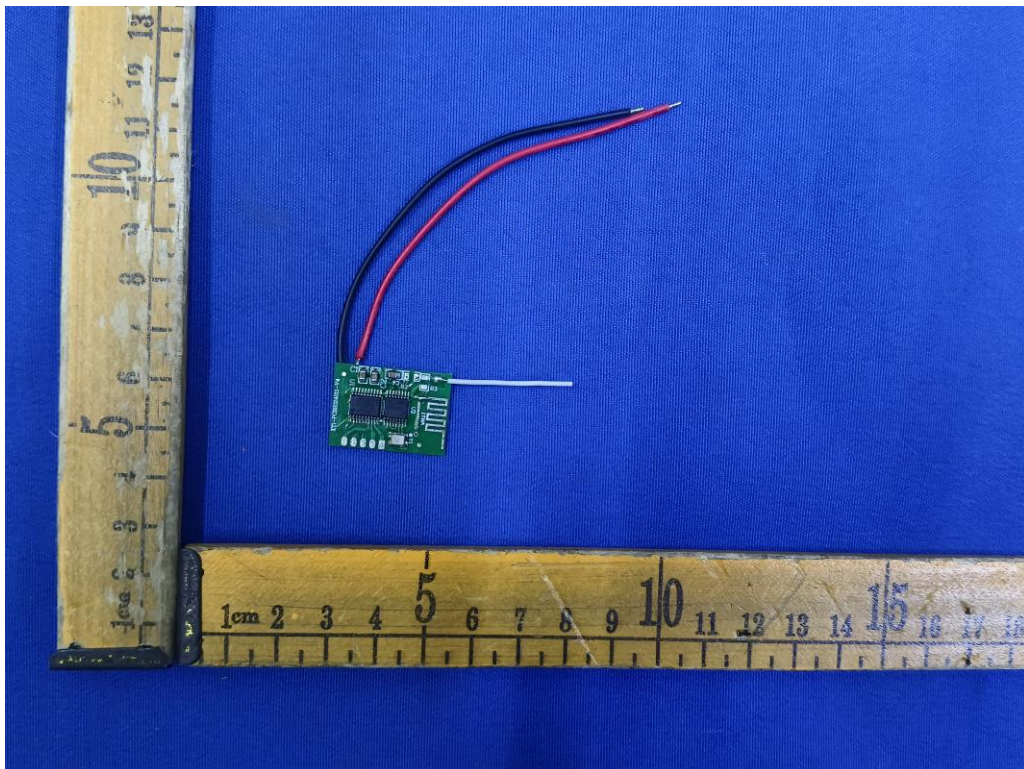
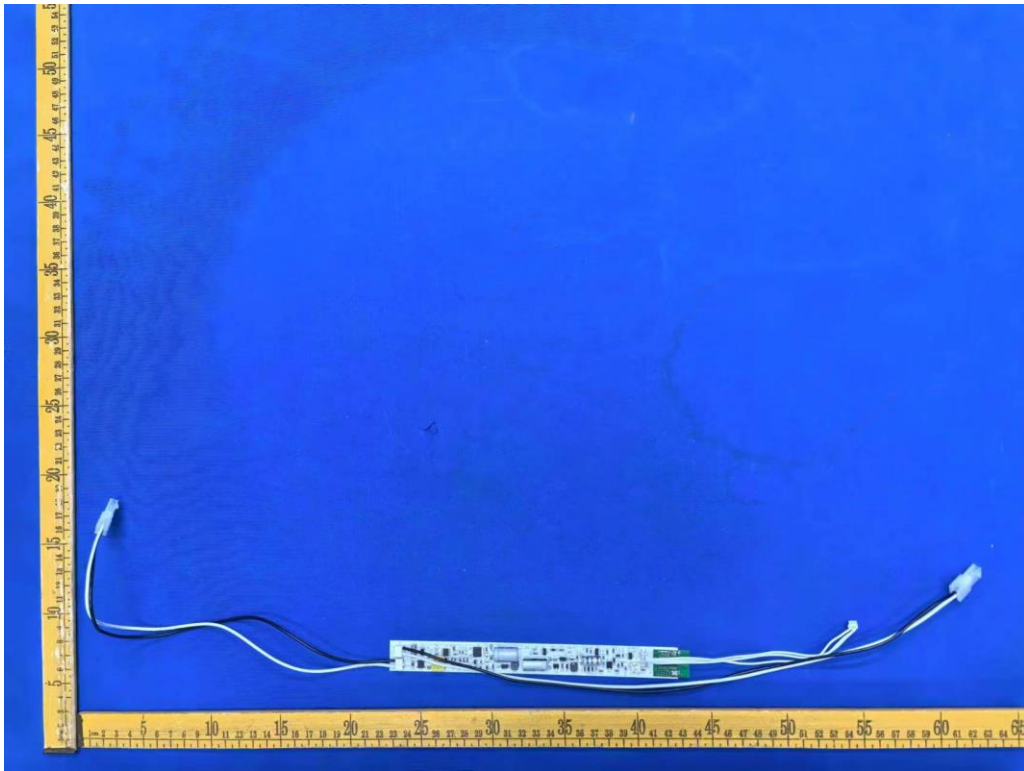


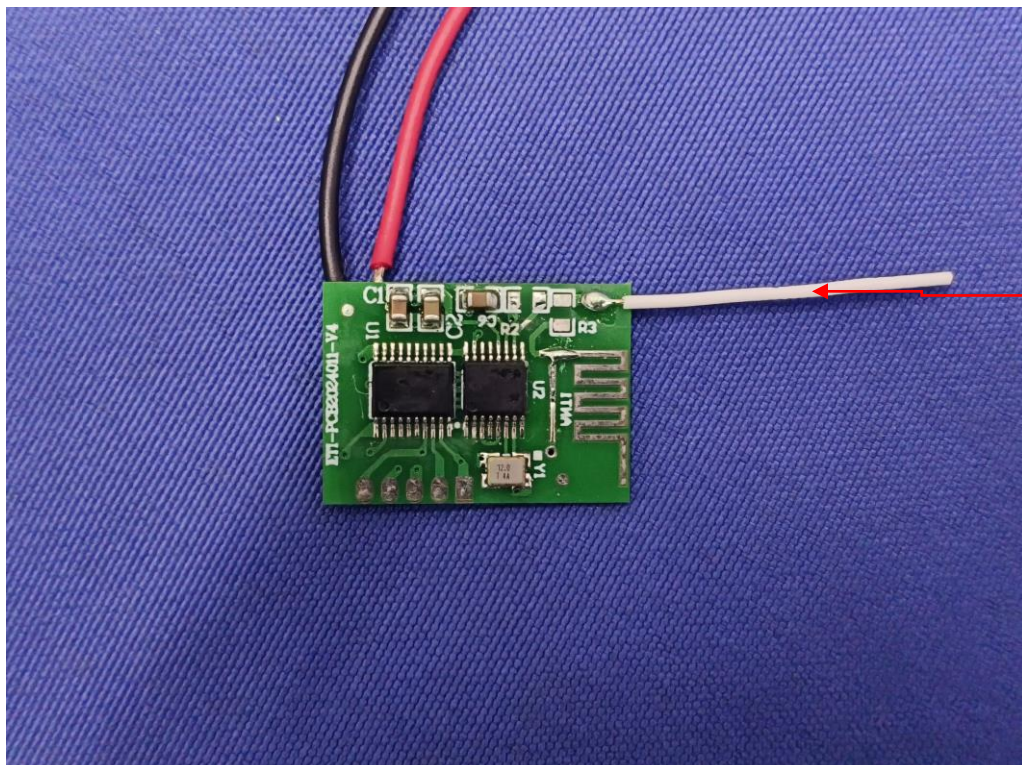
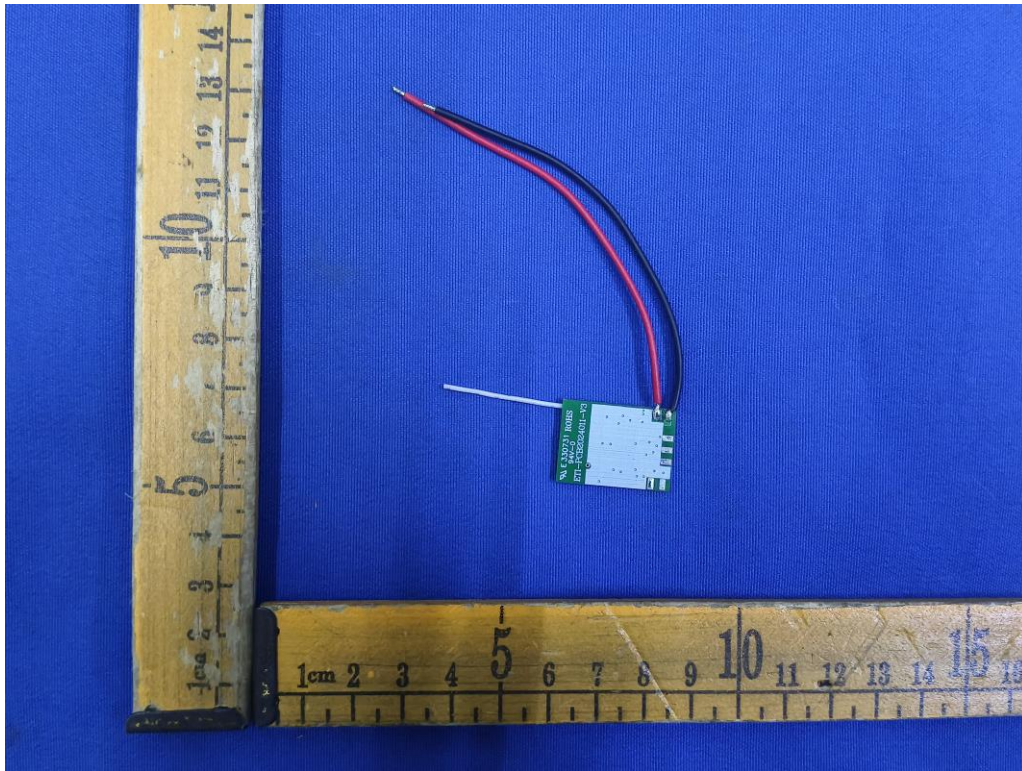


12.Photos of the EUT









Antenna

--END OF REPORT--