RF TEST REPORT

Product Name: Flexbox 5

Model Name: FO.FB.5

FCC ID: 2BMHV-FB5

Issued For : Flexoptix GmbH

Muehltalstr. 153, 64297 Darmstadt, Germany

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

Report Number:	LGT24K034RF02
Sample Received Date:	Nov. 07, 2024
Date of Test:	Nov. 07, 2024 ~ Dec. 06, 2024
Date of Issue:	Dec. 06, 2024

The test report is effective only with both signature and specialized stamp. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report only apply to the tested sample.

TEST REPORT CERTIFICATION

Applicant:	Flexoptix GmbH
Address:	Muehltalstr. 153, 64297 Darmstadt, Germany
Manufacturer:	Flexoptix GmbH
Address:	Muehltalstr. 153, 64297 Darmstadt, Germany
Product Name:	Flexbox 5
Trademark:	FLEXBOX
Model Name:	FO.FB.5
Sample Status:	Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15 Subpart C ANSI C63.10-2013	PASS

Prepared by:

Zane Shan

Zane Shan
Engineer

Approved by:

Vita Li
Technical Director

SHENZHEN LGT TEST SERVICE CO., LTD. LGT 领冠检测

Table of Contents **Page**

1. SUMMARY OF TEST RESULTS **5**

1.1 TEST FACTORY 5

1.2 MEASUREMENT UNCERTAINTY 5

2. GENERAL INFORMATION **6**

2.1 GENERAL DESCRIPTION OF THE EUT 6

2.2 DESCRIPTION OF THE TEST MODES 7

2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS 8

2.4 EQUIPMENTS LIST 9

3. EMC EMISSION TEST **10**

3.1 CONDUCTED EMISSION MEASUREMENT 10

3.2 RADIATED EMISSION MEASUREMENT 14

4. BANDWIDTH TEST **19**

4.1 LIMIT 19

4.2 TEST PROCEDURE 19

4.3 TEST RESULTS 19

APPENDIX III - PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS **20**

Revision History

Rev.	Issue Date	Contents
00	Dec. 06, 2024	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.209(a)	Radiated emission, Spurious Emission	PASS	--
15.215	20 dB Bandwidth	PASS	--

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2013.

1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Chen Hsong Industrial Park, No.177 Renmin West Road, Jinsha Community, Kengzi Street, Pingshan New District, Shenzhen, China
Accreditation Certificate	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 9K-30MHz	±2.84dB
4	All emissions, radiated 30M-1GHz	±4.39dB
5	All emissions, radiated 1G-6GHz	±5.10dB
6	All emissions, radiated>6G	±5.48dB
7	Conducted Emission (9KHz-150KHz)	±2.79dB
8	Conducted Emission (150KHz-30MHz)	±2.80dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Flexbox 5
Trademark:	FLEXBOX
Model Name:	FO.FB.5
Series Model:	N/A
Model Difference:	N/A
Channel List:	Please refer to the Note 3.
Operating frequency	128-130KHz
Equipemnt Category	Non-ISM frequency
Antenna Type:	Coil
Rating:	Input: 5V/9V/12V/15V – up to 3A
Battery:	Capacity: 2000mAh Rated Voltage: 3.7V
Hardware Version:	FO.FB.5
Software Version:	flexRTOS-firmware_v1_3_7
Connecting I/O Port(s):	Please refer to the Note 1.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. The antenna information refers the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.
3.

Channel List					
Channel	Frequency (KHz)	Channel	Frequency (KHz)	Channel	Frequency (KHz)
00	129.1				

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging+TX Mode

For Conducted Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	INOI	IN-C01/19	N/A	Input: 100-240V ~ 50/60Hz 0.25A Output: 5V, 2A
USB-A to USB-C Cable	N/A	N/A	N/A	1m, unshielded, without ferrite core

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	HUAWEI	HKF-16	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

(2) “YES” is means “with core”; “NO” is means “without core”.

2.4 EQUIPMENTS LIST

Conducted Emission

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU	100372	2024.03.09	2025.03.08
LISN	COM-POWER	LI-115	02032	2024.03.09	2025.03.08
LISN	SCHWARZBECK	NNLK 8121	00847	2024.03.09	2025.03.08
CE Cable	N.A	C01	N.A	2024.03.09	2025.03.08
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2024.03.09	2025.03.08
Temperature & Humidity	KTJ	TA218B	N.A	2024.03.09	2025.03.08
Testing Software	EMC-I_V1.4.0.3_SKET				

Radiation Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU	100372	2024.03.09	2025.03.08
Spectrum Analyzer	Keysight	N9010B	MY60242508	2024.08.05	2025.08.04
Active loop Antenna	ETS	6502	00049544	2023.10.13	2025.10.12
Bilog Antenna	SCHWARZBECK	VULB 9168	01447	2022.12.12	2025.12.11
Horn Antenna	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01
Pre-amplifier (9kHz-1GHz)	EMtrace	RP01A	02017	2024.03.09	2025.03.08
Pre-amplifier(1-26.5G)	Agilent	8449B	3008A4722	2024.03.09	2025.03.08
RE Cable (9K-1G)	N.A	R01	N.A	2024.03.09	2025.03.08
RE Cable (1-26G)	N.A	R02	N.A	2024.03.09	2025.03.08
Temperature & Humidity	KTJ	TA218B	N.A	2024.03.09	2025.03.08
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Connected Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
Signal Generator	Keysight	N9010B	MY60242508	2024.08.05	2025.08.04
Signal Analyzer	Keysight	N9020A	MY50530994	2024.03.09	2025.03.08
Temperature & Humidity	KTJ	TA218B	N/A	2024.03.09	2025.03.08
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2024.03.09	2025.03.08
Attenuator	eastsheep	90db	N/A	2024.03.09	2025.03.08
Testing Software	MTS 8310_2.0.0.0_MWRF-TEST				

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

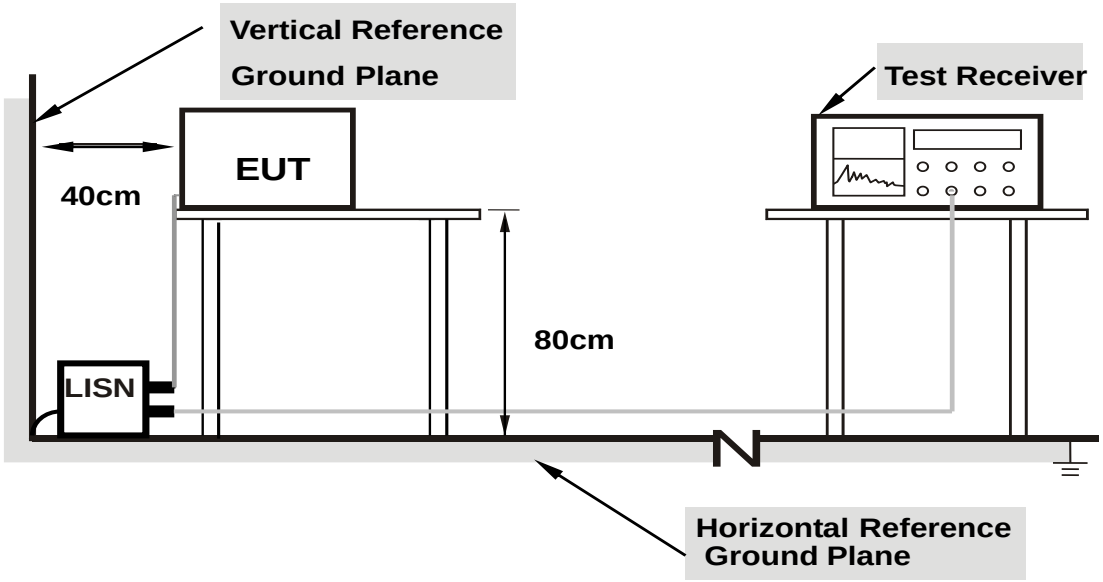
The following table is the setting of the receiver

Receiver Parameters	**Setting**
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN is at least 80 cm from the nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

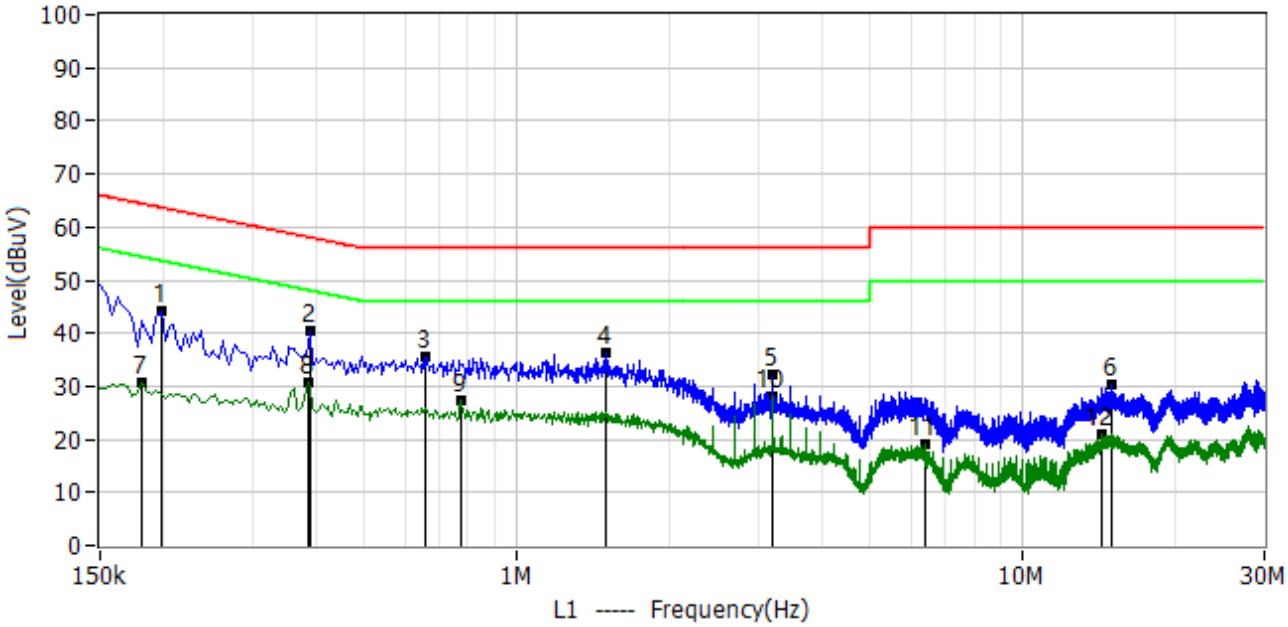
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

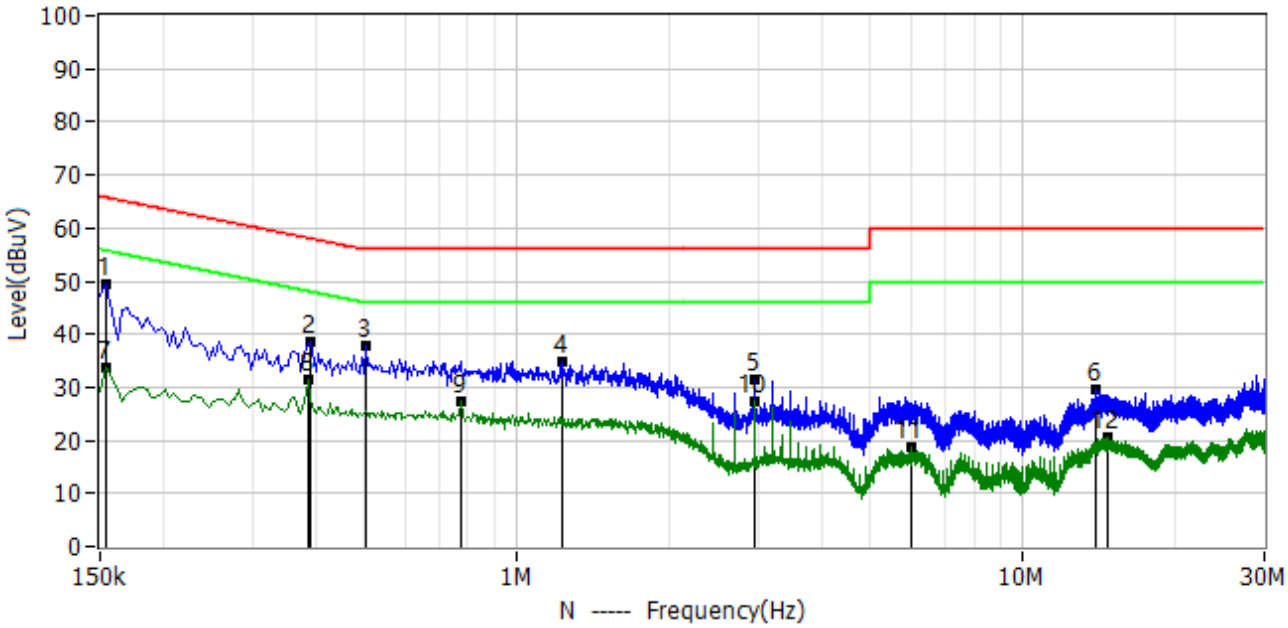
3.1.5 TEST RESULT

Project: LGT24K034	Test Engineer: LiuH
EUT: Flexbox 5	Temperature: 22.2℃
M/N: FO.FB.5	Humidity: 63%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-21
Test Mode: Wireless output 15W	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.198	33.41	10.62	44.03	63.69	-19.67	QP	L1
2*	0.390	29.74	10.56	40.30	58.06	-17.76	QP	L1
3*	0.658	25.02	10.57	35.59	56.00	-20.41	QP	L1
4*	1.494	25.34	10.84	36.18	56.00	-19.82	QP	L1
5*	3.206	21.00	11.18	32.18	56.00	-23.82	QP	L1
6*	14.930	18.86	11.38	30.24	60.00	-29.76	QP	L1
7*	0.182	20.15	10.61	30.76	54.39	-23.64	AV	L1
8*	0.386	20.11	10.57	30.68	48.15	-17.47	AV	L1
9*	0.774	16.80	10.60	27.40	46.00	-18.60	AV	L1
10*	3.206	16.99	11.18	28.17	46.00	-17.83	AV	L1
11*	6.410	8.13	11.02	19.15	50.00	-30.85	AV	L1
12*	14.362	9.55	11.34	20.89	50.00	-29.11	AV	L1

Project: LGT24K034	Test Engineer: LiuH
EUT: Flexbox 5	Temperature: 22.2℃
M/N: FO.FB.5	Humidity: 63%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-21
Test Mode: Wireless output 15W	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.154	38.81	10.57	49.38	65.78	-16.41	QP	N
2*	0.390	27.97	10.59	38.56	58.06	-19.50	QP	N
3*	0.502	27.33	10.54	37.87	56.00	-18.13	QP	N
4*	1.234	24.14	10.59	34.73	56.00	-21.27	QP	N
5*	2.950	20.52	10.78	31.30	56.00	-24.70	QP	N
6*	13.990	18.43	11.30	29.73	60.00	-30.27	QP	N
7*	0.154	23.08	10.57	33.65	55.78	-22.14	AV	N
8*	0.386	20.84	10.59	31.43	48.15	-16.72	AV	N
9*	0.778	16.75	10.56	27.31	46.00	-18.69	AV	N
10*	2.950	16.53	10.78	27.31	46.00	-18.69	AV	N
11*	6.030	7.86	10.83	18.69	50.00	-31.31	AV	N
12*	14.678	9.10	11.35	20.45	50.00	-29.55	AV	N

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part 15.209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

§ 15.209(d)The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

3.2.2 TEST PROCEDURE

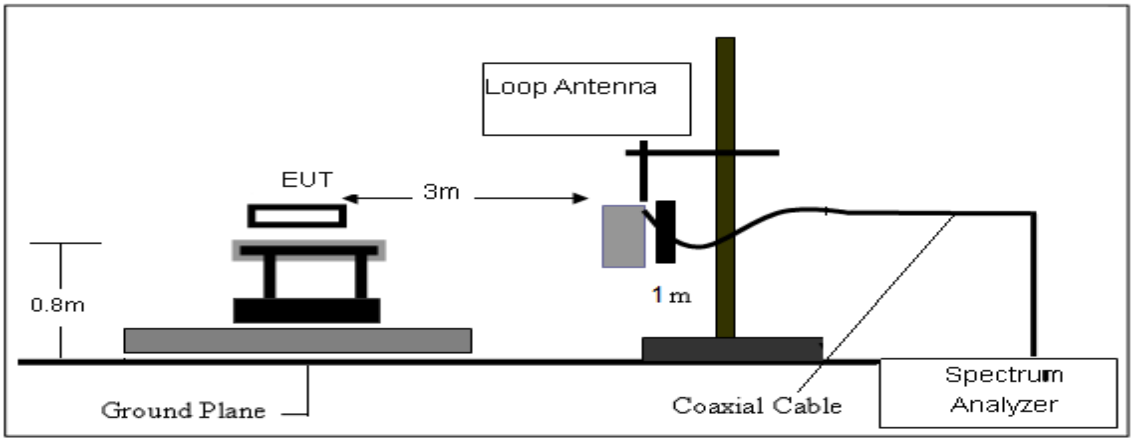
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

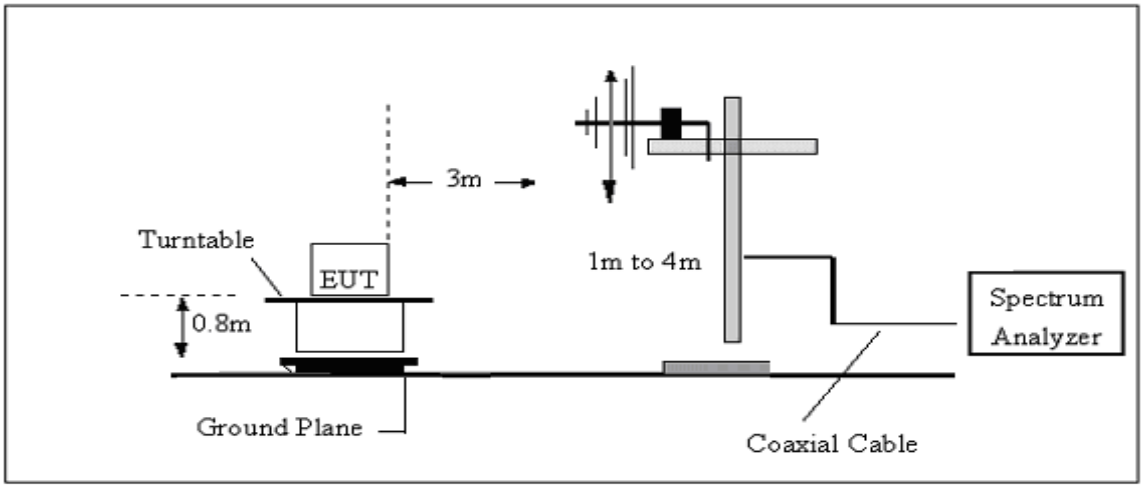
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 TESTSETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz

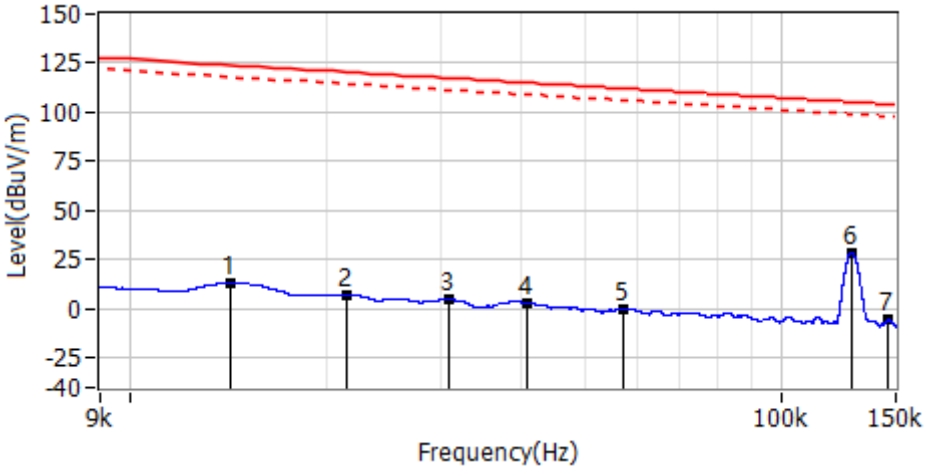


3.2.7 TEST RESULTS

Spurious Radiated Emission Below 30 MHz

9KHz-150KHz

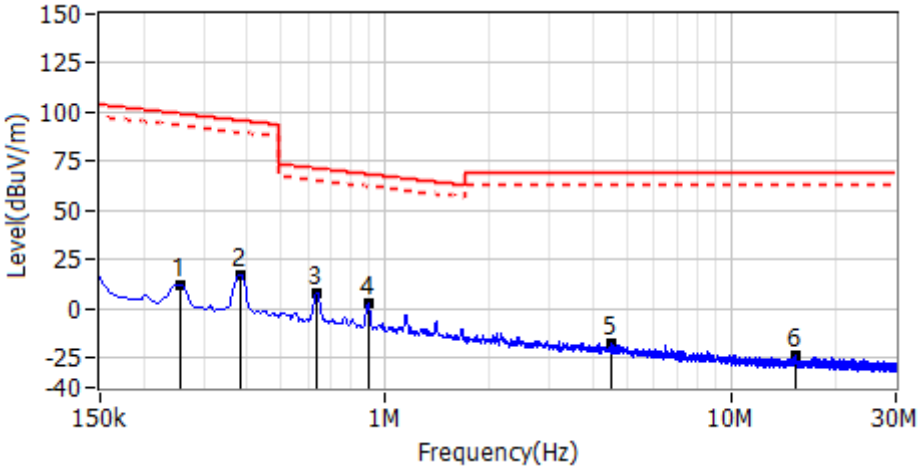
Project: LGT24K034	Test Engineer: LiuH
EUT: Flexbox 5	Temperature: 25℃
M/N: FO.FB.5	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-12-05
Test Mode: Wireless output 15W	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector
1*	14.3051kHz	47.83	-34.65	13.18	124.04	-110.85	PK
2*	21.5490kHz	44.40	-37.13	7.27	120.53	-113.26	PK
3*	30.9079kHz	43.04	-38.05	4.99	117.44	-112.45	PK
4*	40.8131kHz	41.58	-38.79	2.79	115.07	-112.28	PK
5*	57.4159kHz	39.80	-39.48	0.32	112.14	-111.82	PK
6*	128.4270kHz	68.12	-39.48	28.64	105.26	-76.62	PK
7*	146.1225kHz	34.15	-39.48	-5.33	104.15	-109.48	PK

150KHz-30MHz

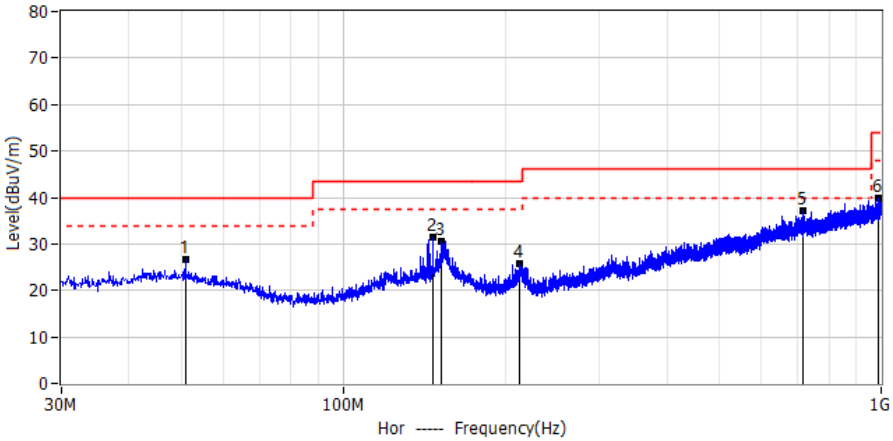
Project: LGT24K034	Test Engineer: LiuH
EUT: Flexbox 5	Temperature: 25℃
M/N: FO.FB.5	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-12-05
Test Mode: Wireless output 15W	
Note:	



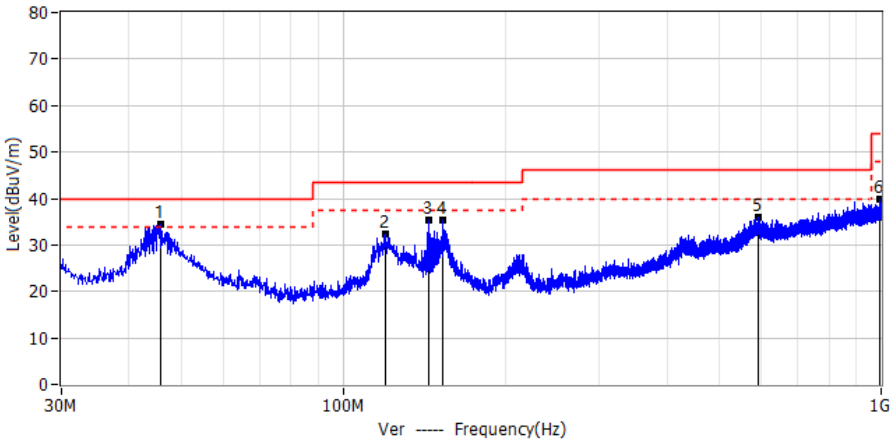
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector
1*	254.4750kHz	51.71	-39.47	12.24	99.41	-87.17	PK
2*	381.3375kHz	56.69	-39.47	17.22	95.95	-78.73	PK
3*	635.0625kHz	47.56	-39.46	8.10	71.55	-63.45	PK
4*	892.5188kHz	41.91	-39.45	2.46	68.59	-66.13	PK
5*	4.5342MHz	21.44	-39.41	-17.97	69.54	-87.51	PK
6*	15.3250MHz	16.79	-40.15	-23.36	69.54	-92.90	PK

Spurious Radiated Emission Below 1 GHz

Project: LGT24K034	Test Engineer: LiuH
EUT: Flexbox 5	Temperature: 24.3℃
M/N: FO.FB.5	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-25
Test Mode: Wireless output 15W	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	50.976	5.88	20.66	26.54	40.00	-13.46	QP	Hor
2*	147.006	9.66	21.68	31.34	43.50	-12.16	QP	Hor
3*	152.463	9.14	21.43	30.57	43.50	-12.93	QP	Hor
4*	212.239	8.28	17.42	25.70	43.50	-17.80	QP	Hor
5*	714.214	6.49	30.66	37.15	46.00	-8.85	QP	Hor
6*	988.239	5.97	33.94	39.91	54.00	-14.09	QP	Hor



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	45.763	14.03	20.43	34.46	40.00	-5.54	QP	Ver
2*	120.089	12.91	19.33	32.24	43.50	-11.26	QP	Ver
3*	143.975	14.16	21.27	35.43	43.50	-8.07	QP	Ver
4*	153.433	13.77	21.66	35.43	43.50	-8.07	QP	Ver
5*	590.781	7.48	28.53	36.01	46.00	-9.99	QP	Ver
6*	994.665	5.99	33.77	39.76	54.00	-14.24	QP	Ver

4. BANDWIDTH TEST

4.1 LIMIT

FCC Part 15.215, Only applicable to report.

4.2 TEST PROCEDURE

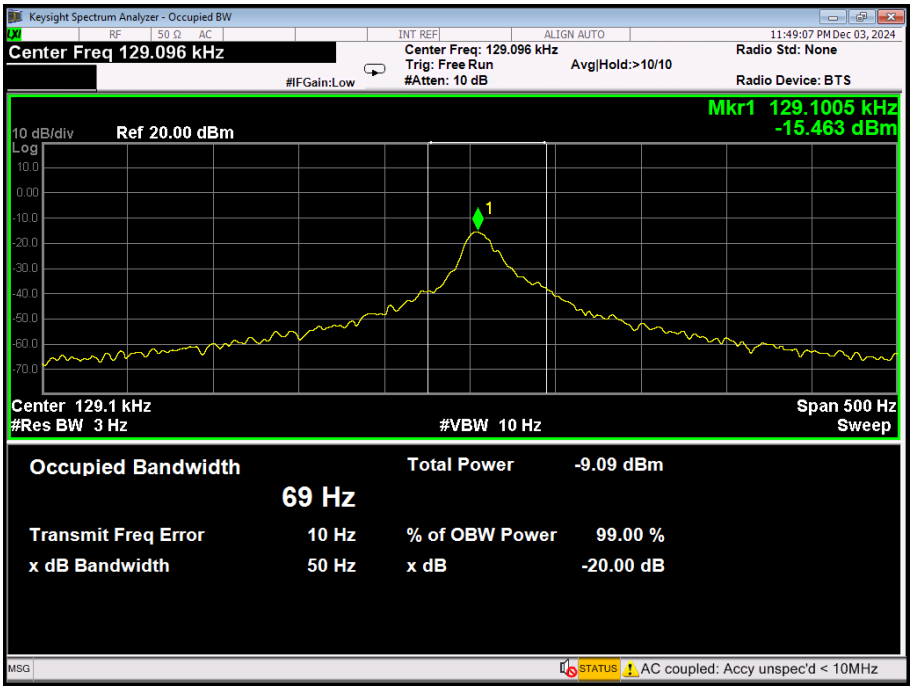
Spectrum Parameter	Setting
Span Frequency	between two times and five times the OBW
RB	1% to 5% of the OBW
VB	approximately three times RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

The test program and configuration, refer to 3.2.2 and 3.2.3.

4.3 TEST RESULTS

OperatingFrequency（kHz）	20 dB Bandwhidth(kHz)
129.1	0.050

CH00



APPENDIX III - PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Note: Please see the attached FO.FB.5_EUT Photos.

※※※※※END OF THE REPORT※※※※※