

PARTIAL TEST REPORT

of

RE Directive (2014/53/EU)

ETSI EN 300 328 v2.2.2

Product: Bluetooth 5.0 Module

Brand: Fanstel


Model: BT840X, BT840XE

Model Difference: Please see page 5 model summaries table

Applicant: Fanstel Corporation, Taipei

Address: 10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd.,
Hsi-Chih, New Taipei City 221 Taiwan

Test Performed by:

 **International Standards Laboratory Corp. LT Lab.**
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No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325,
Taiwan

Report No.: **ISL-23LR0074E328**
Issue Date :**2023/12/06**



Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

The uncertainty of the measurement does not include in consideration of the test result unless the customer required the determination of uncertainty via the agreement, regulation or standard document specification. This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory Corp.

VERIFICATION OF COMPLIANCE

Applicant: Fanstel Corporation, Taipei
Equipment Under Test: Bluetooth 5.0 Module
Brand Name: Fanstel
Model Number: BT840X, BT840XE
Model Different: Please see page 5 model summaries table
Date of Test: 2023/11/24 ~ 2023/12/05
Date of EUT Received: 2023/11/24

APPLICABLE STANDARDS
ETSI EN 300 328 V2.2.2
This report only covers partial test item, including EIRP, TX RSE, and RX RSE.

The above equipment was tested by International Standards Laboratory Corp. for compliance with the requirements set forth in the European Standard ETSI EN 300328 V V2.2.2. under article 3.2 of RE Directive 2014/53/EU. The results of testing in this report apply to the product/system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Test By:	 <hr/> <i>Weitin Chen / Senior Engineer</i>	Date:	2023/12/06 <hr/>
Prepared By:	 <hr/> <i>Gigi Yeh / Senior Engineer</i>	Date:	2023/12/06 <hr/>
Approved By:	 <hr/> <i>Jerry Liu / Manager</i>	Date:	2023/12/06 <hr/>

Version

Version No.	Date	Description
00	2021/01/15	Initial creation of document
01	2023/12/06	This is an additional report. Due to the replacement of the SAW filter in the product, RF output power, transmitter unwanted radiation and Receiver Spurious Emissions tests were conducted, with comparisons made against the original data. For other test data, please refer to the original case 19LR022E328.

TABLE OF CONTENTS

1. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	5
2. DESCRIPTION OF TEST MODES	7
3. GENERAL DESCRIPTION OF APPLIED STANDARDS	8
4. TEST FACILITY	8
5. BLOCK DIAGRAM OF TEST SETUP	9
6. RF OUTPUT POWER	15
7. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN.....	17
8. ETSI EN 300 328 SUB-CLAUSE 4.3.2.10 RECEIVER SPURIOUS EMISSIONS	22
PHOTOGRAPHS OF SET UP	27
PHOTOGRAPHS OF EUT.....	34

1. Description of Equipment under Test (EUT)

General:

Product Name:	Bluetooth 5.0 Module
Brand:	Fanstel
Model:	BT840X, BT840XE
Model different:	Please see model summaries table below
Power Supply:	5Vdc
Type of Equipment:	Embed Modular
Temperature Range:	-40°C to + 85°C
Geo-location capability:	no
Simultaneous transmissions:	N/A

Model Summaries

module	BT840X	BT840XE
SoC	nRF52840-QIAA	nRF52840-QIAA
Size	15x20.8x1.9mm	15x20.8x1.9mm
BT Antenna	PCB trace	PA + u.FL
32.768 sleep crystal	Integrated	Integrated
Availability	Sample	Sample

BT BLE:

Bluetooth Version	BT 5.0 (GFSK)
Frequency Range:	2402 – 2480MHz
Channel number:	40 channels
Modulation type:	GFSK
Transmit Power: (EIRP)	15.97dBm
Dwell Time:	N/A
Operating Mode:	Point-to-Point
Adaptive/ Non-Adaptive Equipment	Adaptive
Duty Cycle	N/A
Antenna Beam forming	No
Antenna Designation:	Type: PCB Antenna, BT840X : 0.87 dBi Type: Dipole Antenna, BT840XE : 0 dBi

This test report applies for BT 5.0

RF Output Power Comparison Results:

Mode	Frequency (MHz)	Temp.	Output Power e.i.r.p. (dBm)		Power difference
			Original Value	Present Value	
BLE	2402	Normal	6.67	6.77	0.10
		Low	14.47	14.27	-0.20
		High	6.67	6.77	0.10
	2442	Normal	8.37	8.27	-0.10
		Low	16.17	15.97	-0.20
		High	8.27	8.07	-0.20
	2480	Normal	7.77	7.77	0.00
		Low	15.57	15.37	-0.20
		High	7.87	7.87	0.00

2. Description of Test Modes

The EUT has been tested under Operating condition. To control the EUT for staying in continuous transmitting and receiving mode is programmed.

Model BT840X is the worst case for testing.

BLE: Lowest (2402MHz), Mid (2442MHz) and Highest (2480MHz) mode.

Normal test conditions :

Refer to section 5.1.1.2 of EN 300 328

Temperature : + 15°C to 35 °C

Relative humidity: 20 % to 50 %

Normal Voltage: 5Vdc

Extreme test conditions :

Refer to section 5.1.1.3 of EN 300 328

Where tests at extreme temperatures are required, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

Extreme temperatures: -40°C to + 85°C

3. General Description of Applied Standards

The EUT According to the Specifications, it must comply with the requirements of the following standards:

ETSI EN 300 328 V2.2.2 – Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band; Harmonized Standard for access to radio spectrum

4. Test Facility

International Standards Laboratory Corp.

<LT Lab.>

No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

A fully anechoic chamber was used for the radiated spurious emissions test.

TAF Accreditation Lab. Lab number: 0997

5. Block Diagram of Test Setup

5.1 EUT Configuration

Fig. 1 Configuration of Tested System

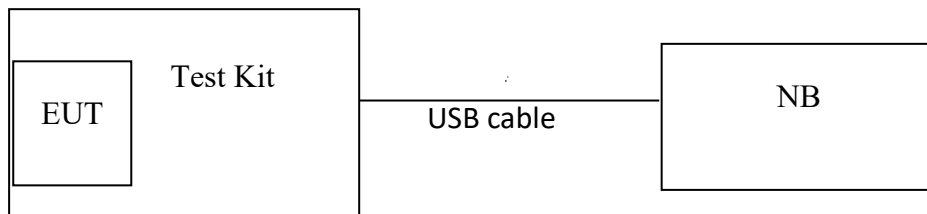
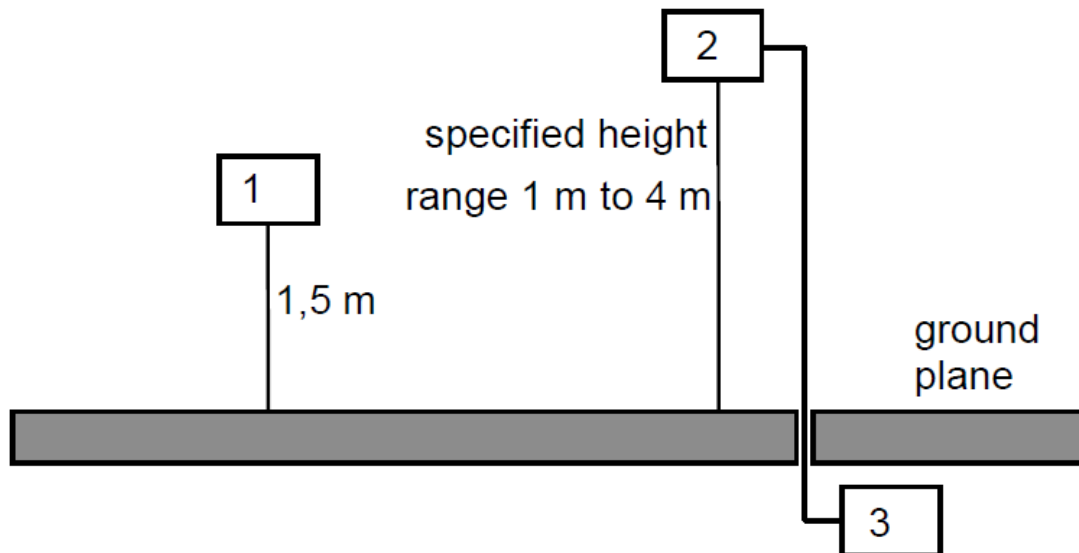


Table 1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Notebook	HP	X440i	N/A	N/A	Non-shielded
2	Test Kit	N/A	N/A	N/A	N/A	N/A

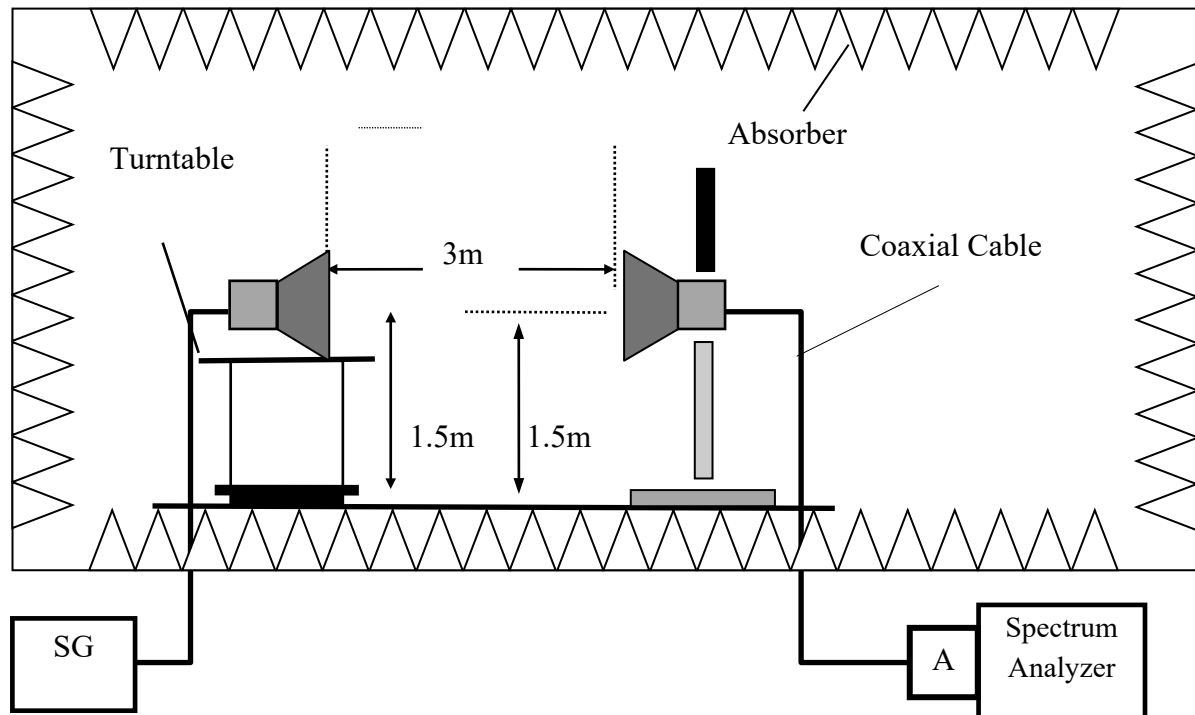
5.2 Test Setup for ERP/EIRP Measurement

5.2.1 Step 1. Field Strength Measurement OATS or SAR test Site

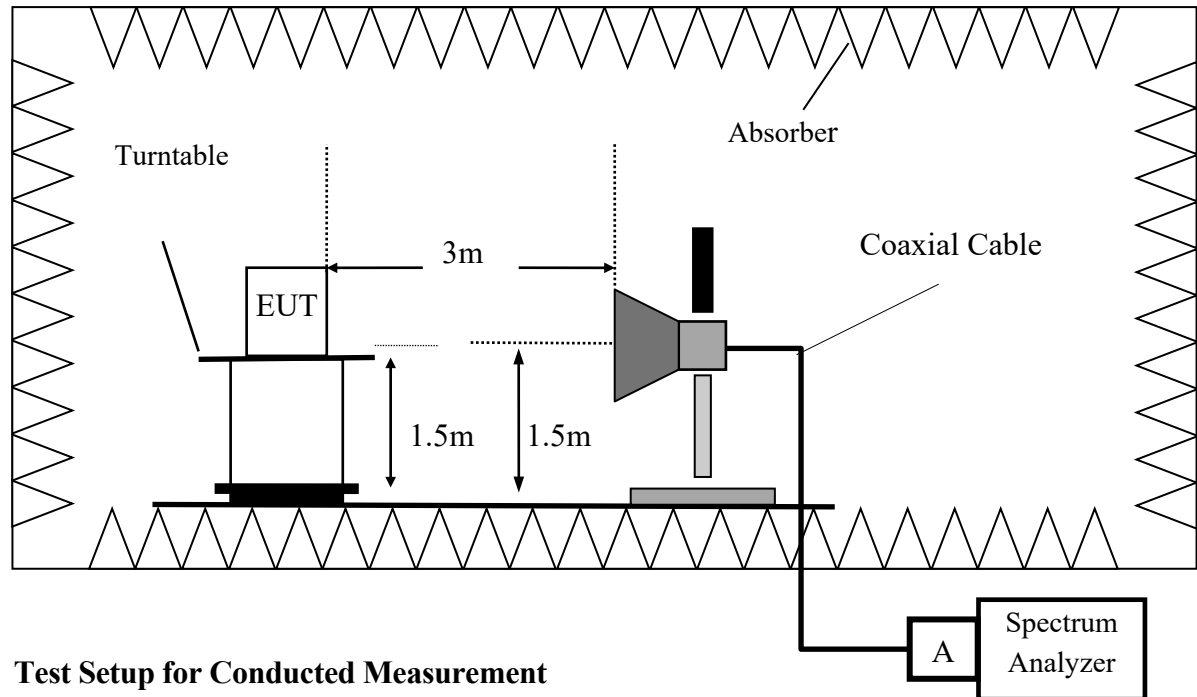


- 1) UUT
- 2) Measurement antenna
- 3) Measurement equipment

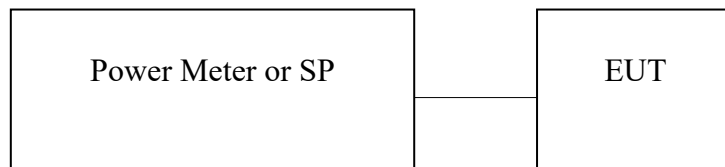
FAR Test Site



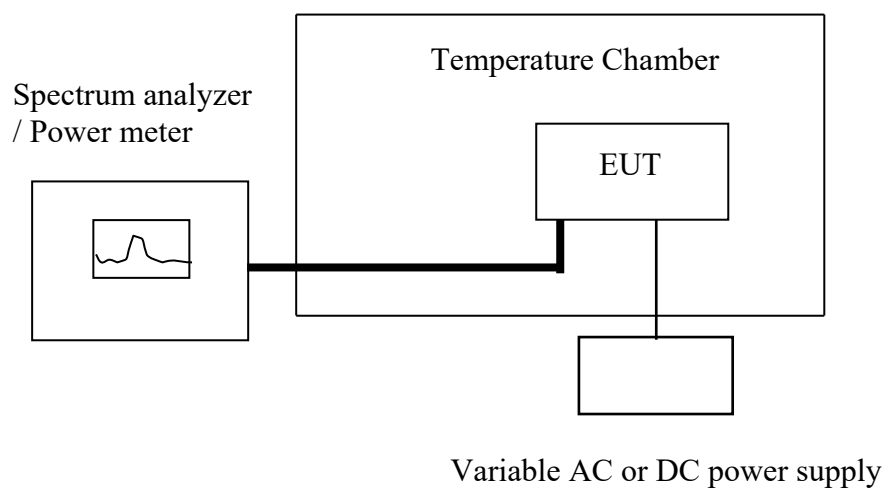
Step 2. SUBSTITUTION METHOD:



5.3 Test Setup for Conducted Measurement



5.4 Test Setup for Extreme test



5.5 Test Setup for verifying the receiver blocking of an equipment

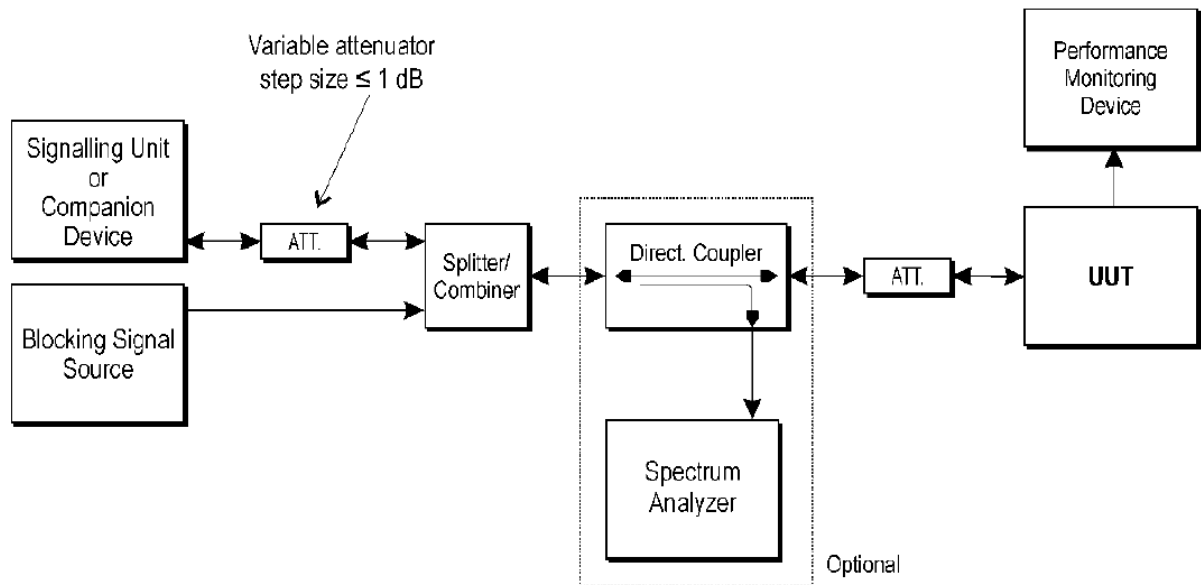


Figure 6: Test Set-up for receiver blocking

5.6 Measurement Equipment Used:

Location Conducted	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Chamber 16	Signal Analyzer (44GHz)	R&S	FSV3044	101463	02/07/2023	02/07/2024
Chamber 16	Loop Antenna	EM	EM-6879	271	10/02/2023	10/02/2024
Chamber 16	Bilog Antenna	Schwarzbeck	VULB9168 w 5dB Att.	9168-495	11/16/2023	11/16/2024
Chamber 16	Horn antenna (1GHz - 18GHz)	EM	EM-AH-10180	2011071401	11/27/2023	11/27/2024
Chamber 16	Horn antenna (18GHz-26GHz)	Com-power	AH-826	081001	11/24/2023	11/24/2024
Chamber 16	Horn antenna (26GHz - 40GHz)	Com-power	AH-640	100A	03/25/2023	03/25/2024
Chamber 16	Preamplifier (10MHz - 3GHz)	EM	EM330	060674	6/21/2023	6/21/2024
Chamber 16	Preamplifier (1GHz - 26GHz)	EM	EM01M26G	060559	6/20/2023	6/20/2024
Chamber 16	Preamplifier (26GHz - 40GHz)	MITEQ	JS4-26004000-27-5A	818471	05/04/2023	05/04/2024
Chamber 16	Cable 002 (1GHz-26.5GHz)	HUBER SUHNER	Sucoflex 104A	MY816/4A&MY277/4A&MY278/4A&MY818/4A	12/21/2022	12/21/2023
Chamber 16	Cable 001 (100kHz-1GHz)	HUBER SUHNER	Sucoflex 104A	1166 cable 001	12/21/2022	12/21/2023
Chamber 16	RF Cable (18GHz-40GHz)	HUBER SUHNER	Sucoflex 102	27963/2&37421/2	11/22/2023	11/22/2024
Chamber 16	Signal Generator	Anritsu	MG3692A	20311	12/29/2022	12/29/2023
Chamber 16	Test Software	Audix	E3 Ver:6.120203a	N/A	N/A	N/A
Chamber 16	Signal Analyzer (44GHz)	R&S	FSV3044	101463	02/07/2023	02/07/2024
Chamber 16	Loop Antenna	EM	EM-6879	271	10/02/2023	10/02/2024

Location Conducted	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conducted	Power Meter	Anritsu	ML2495A	1116010	09/27/2023	09/27/2024
Conducted	Power Sensor	Anritsu	MA2411B	34NKF50	09/27/2023	09/27/2024
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO33	01/06/2023	01/06/2024
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO34	01/06/2023	01/06/2024
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO35	06/21/2023	06/21/2024
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO36	06/21/2023	06/21/2024
Conducted	Temperature Chamber	KSON	THS-B4H100	2287	05/17/2023	05/17/2024
Conducted	DC Power supply	ABM	8185D	N/A	01/04/2023	01/04/2024
Conducted	AC Power supply	EXTECH	CFC105W	NA	N/A	N/A
Conducted	Spectrum analyzer	Keysight	N9010A	MY56070257	09/26/2023	09/26/2024
Conducted	Test Software	DARE	Radiation Ver:2013.1.23	NA	NA	NA
Conducted	Wideband Radio Comm. Tester	R&S	CMW500	1201.002K50108 793-JG	10/26/2023	10/26/2024
Conducted	Radio Communication Test Station	Anritsu	MT8000A	6272539604	08/30/2023	08/30/2024
Conducted	BT Simulator	Agilent	N4010A	MY48100200	NA	NA
Conducted	Signal Generator	Agilent	E4438C	MY49071550	12/28/2022	12/28/2023
Conducted	Signal Generator	Keysight	N5182B	MY53052399	12/28/2022	12/28/2023
Conducted (TS8997)	Wideband Radio Comm. Tester	R&S	CMW500	168811	09/13/2023	09/13/2024
Conducted (TS8997)	UP/DOWN converter	R&S	CMW-Z800A	100566	09/13/2023	09/13/2024
Conducted (TS8997)	Signal Generator	R&S	SMB100A	183701	09/14/2023	09/14/2024
Conducted (TS8997)	Vector Signal Generator	R&S	SMM100A	101908	09/13/2023	09/13/2024
Conducted (TS8997)	Signal analyzer 40GHz	R&S	FSV40	101884	09/13/2023	09/13/2024
Conducted (TS8997)	OSP150 extension unit CAM-BUS	R&S	OSP150	101107	09/15/2023	09/15/2024
Conducted (TS8997)	Test Software	R&S	EMC32 Ver:11.60.00	NA	NA	NA

6. RF Output Power

6.1. Limit

For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. See clause 5.3.1 m). For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

6.2. Test Procedure

See Sub-Clause 5.4.2.1 of ETSI EN 300 328 for the test conditions

See Sub-Clause 5.4.2.2 of ETSI EN 300 328 for the test method

6.3. Test Result

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

antenna assembly gain "G" in dBi	0.87	dBi
beamforming gain "Y" in dB	0.00	dB
Cable Loss=	1.00	dB

Mode	Frequency (MHz)	Temp.	Output Power e.i.r.p. (dBm)	Limit (dBm)	Results
BLE	2402	Normal	6.77	20	Pass
		Low	14.27	20	Pass
		High	6.77	20	Pass
	2442	Normal	8.27	20	Pass
		Low	15.97	20	Pass
		High	8.07	20	Pass
	2480	Normal	7.77	20	Pass
		Low	15.37	20	Pass
		High	7.87	20	Pass

7. Transmitter Unwanted Emissions in the Spurious Domain

7.1 Limit

This requirement applies to all types of equipment using wide band modulations other than FHSS.

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 2.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 2: Transmitter limits for spurious emissions

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87.5 MHz	-36 dBm	100 kHz
87.5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12.75 GHz	-30 dBm	1 MHz

7.2 Test Procedure

See Sub-Clause 5.4.9.1 of ETSI EN 300 328 for the test conditions

See Sub-Clause 5.4.9.2 and 5.4.9.2.2 of ETSI EN 300 328 for Conducted Pre-Scan test method.

See Sub-Clause 5.4.9.2.2 of ETSI EN 300 328 for final Radiated test method.

7.3 Test Result

Model: BT840X

Test Mode: BLE mode, TX CH Low

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	85.16	-52.59	1.00	-51.59	-36.00	-15.59	VERTICAL
2	192.74	-63.49	2.23	-61.26	-54.00	-7.26	VERTICAL
3	504.72	-74.26	8.95	-65.31	-54.00	-11.31	VERTICAL
4	615.08	-74.44	10.73	-63.71	-54.00	-9.71	VERTICAL
5	743.57	-78.56	13.73	-64.83	-54.00	-10.83	VERTICAL
6	814.48	-75.08	13.83	-61.25	-54.00	-7.25	VERTICAL
7	1,550.00	-63.31	2.18	-61.13	-30.00	-31.13	VERTICAL
8	4,804.00	-72.94	15.71	-57.23	-30.00	-27.23	VERTICAL
1	84.85	-52.81	0.37	-52.44	-36.00	-16.44	HORIZONTAL
2	192.62	-57.66	1.70	-55.96	-54.00	-1.96	HORIZONTAL
3	594.63	-75.26	11.10	-64.16	-54.00	-10.16	HORIZONTAL
4	666.18	-76.63	11.93	-64.70	-54.00	-10.70	HORIZONTAL
5	740.23	-76.58	13.94	-62.64	-54.00	-8.64	HORIZONTAL
6	813.99	-77.35	14.39	-62.96	-54.00	-8.96	HORIZONTAL
7	1,440.00	-62.86	2.16	-60.70	-30.00	-30.70	HORIZONTAL
8	4,804.00	-73.55	15.63	-57.92	-30.00	-27.92	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	84.73	-48.16	1.00	-47.16	-36.00	-11.16	VERTICAL
2	192.80	-62.61	2.23	-60.38	-54.00	-6.38	VERTICAL
3	480.94	-71.82	8.99	-62.83	-54.00	-8.83	VERTICAL
4	592.19	-72.32	9.94	-62.38	-54.00	-8.38	VERTICAL
5	741.09	-79.04	13.74	-65.30	-54.00	-11.30	VERTICAL
6	814.08	-74.82	13.83	-60.99	-54.00	-6.99	VERTICAL
7	1,990.00	-62.03	4.60	-57.43	-30.00	-27.43	VERTICAL
8	4,960.00	-72.49	16.40	-56.09	-30.00	-26.09	VERTICAL
1	85.08	-50.30	0.37	-49.93	-36.00	-13.93	HORIZONTAL
2	192.00	-57.17	1.70	-55.47	-54.00	-1.47	HORIZONTAL
3	594.90	-77.78	11.10	-66.68	-54.00	-12.68	HORIZONTAL
4	665.86	-77.90	11.93	-65.97	-54.00	-11.97	HORIZONTAL
5	743.79	-78.20	14.04	-64.16	-54.00	-10.16	HORIZONTAL
6	817.05	-76.03	14.44	-61.59	-54.00	-7.59	HORIZONTAL
7	1,992.00	-63.20	4.75	-58.45	-30.00	-28.45	HORIZONTAL
8	4,960.00	-72.92	16.15	-56.77	-30.00	-26.77	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Model: BT840XE

Test Mode: BLE mode, TX CH Low

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	85.08	-55.31	1.00	-54.31	-36.00	-18.31	VERTICAL
2	192.36	-63.22	2.23	-60.99	-54.00	-6.99	VERTICAL
3	336.78	-64.45	5.18	-59.27	-36.00	-23.27	VERTICAL
4	592.69	-74.03	9.96	-64.07	-54.00	-10.07	VERTICAL
5	748.45	-77.52	13.72	-63.80	-54.00	-9.80	VERTICAL
6	814.67	-74.26	13.83	-60.43	-54.00	-6.43	VERTICAL
7	1,991.00	-64.51	4.60	-59.91	-30.00	-29.91	VERTICAL
8	4,804.00	-72.96	15.71	-57.25	-30.00	-27.25	VERTICAL
1	84.46	-54.32	0.37	-53.95	-36.00	-17.95	HORIZONTAL
2	192.69	-59.21	1.70	-57.51	-54.00	-3.51	HORIZONTAL
3	594.90	-77.37	11.10	-66.27	-54.00	-12.27	HORIZONTAL
4	701.63	-81.26	12.57	-68.69	-54.00	-14.69	HORIZONTAL
5	796.61	-80.64	14.17	-66.47	-54.00	-12.47	HORIZONTAL
6	860.38	-78.40	15.13	-63.27	-54.00	-9.27	HORIZONTAL
7	1,339.00	-63.81	1.89	-61.92	-30.00	-31.92	HORIZONTAL
8	4,804.00	-72.24	15.63	-56.61	-30.00	-26.61	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	85.13	-49.59	1.00	-48.59	-36.00	-12.59	VERTICAL
2	517.30	-74.33	8.94	-65.39	-54.00	-11.39	VERTICAL
3	606.41	-73.30	10.39	-62.91	-54.00	-8.91	VERTICAL
4	621.45	-76.96	10.96	-66.00	-54.00	-12.00	VERTICAL
5	716.10	-79.69	13.83	-65.86	-54.00	-11.86	VERTICAL
6	814.43	-74.14	13.83	-60.31	-54.00	-6.31	VERTICAL
7	1,996.00	-57.36	4.60	-52.76	-30.00	-22.76	VERTICAL
8	4,960.00	-72.08	16.40	-55.68	-30.00	-25.68	VERTICAL
1	85.25	-48.93	0.37	-48.56	-36.00	-12.56	HORIZONTAL
2	192.69	-58.55	1.70	-56.85	-54.00	-2.85	HORIZONTAL
3	527.56	-75.37	9.30	-66.07	-54.00	-12.07	HORIZONTAL
4	668.41	-77.50	11.98	-65.52	-54.00	-11.52	HORIZONTAL
5	743.20	-77.96	14.04	-63.92	-54.00	-9.92	HORIZONTAL
6	817.39	-77.42	14.44	-62.98	-54.00	-8.98	HORIZONTAL
7	1,997.00	-63.44	4.75	-58.69	-30.00	-28.69	HORIZONTAL
8	4,960.00	-72.85	16.15	-56.70	-30.00	-26.70	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

8. ETSI EN 300 328 SUB-CLAUSE 4.3.2.10 Receiver Spurious Emissions

This requirement applies to all types of equipment using wide band modulations other than FHSS.

8.1 Limit: Sub-Clause 4.3.2.10.3

The spurious emissions of the receiver shall not exceed the values given in table 10.

For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 10: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

8.2 Test Procedure:

See Sub-Clause 5.4.10.1 of ETSI EN 300 328 for the test conditions

See Sub-Clause 5.4.10.2.2 of ETSI EN 300 328 for final Radiated test method.

8.3 Test Result:

Model: BT840X

Test Mode: BLE mode, RX CH Low

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	108.57	-60.51	0.79	-59.72	-57.00	-2.72	VERTICAL
2	216.24	-60.72	2.73	-57.99	-57.00	-0.99	VERTICAL
3	332.67	-63.55	5.09	-58.46	-57.00	-1.46	VERTICAL
4	468.87	-69.84	9.01	-60.83	-57.00	-3.83	VERTICAL
5	592.50	-73.88	9.94	-63.94	-57.00	-6.94	VERTICAL
6	814.11	-76.71	13.83	-62.88	-57.00	-5.88	VERTICAL
7	3,778.00	-70.72	11.08	-59.64	-47.00	-12.64	VERTICAL
8	6,202.00	-73.48	19.01	-54.47	-47.00	-7.47	VERTICAL
1	108.57	-59.58	1.29	-58.29	-57.00	-1.29	HORIZONTAL
2	191.99	-62.08	1.70	-60.38	-57.00	-3.38	HORIZONTAL
3	336.87	-62.65	4.81	-57.84	-57.00	-0.84	HORIZONTAL
4	456.01	-74.32	8.36	-65.96	-57.00	-8.96	HORIZONTAL
5	533.44	-75.80	9.49	-66.31	-57.00	-9.31	HORIZONTAL
6	740.56	-78.80	13.94	-64.86	-57.00	-7.86	HORIZONTAL
7	3,853.00	-70.36	11.80	-58.56	-47.00	-11.56	HORIZONTAL
8	6,429.00	-73.26	23.17	-50.09	-47.00	-3.09	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	84.32	-58.84	1.00	-57.84	-57.00	-0.84	VERTICAL
2	191.99	-62.96	2.23	-60.73	-57.00	-3.73	VERTICAL
3	280.54	-64.49	4.49	-60.00	-57.00	-3.00	VERTICAL
4	336.90	-65.46	5.18	-60.28	-57.00	-3.28	VERTICAL
5	456.10	-74.68	9.04	-65.64	-57.00	-8.64	VERTICAL
6	592.32	-73.57	9.94	-63.63	-57.00	-6.63	VERTICAL
7	3,656.00	-71.99	10.35	-61.64	-47.00	-14.64	VERTICAL
8	6,223.00	-72.61	19.05	-53.56	-47.00	-6.56	VERTICAL
1	84.32	-59.17	0.37	-58.80	-57.00	-1.80	HORIZONTAL
2	216.24	-60.31	2.41	-57.90	-57.00	-0.90	HORIZONTAL
3	337.49	-63.33	4.81	-58.52	-57.00	-1.52	HORIZONTAL
4	534.33	-73.27	9.52	-63.75	-57.00	-6.75	HORIZONTAL
5	740.10	-77.91	13.94	-63.97	-57.00	-6.97	HORIZONTAL
6	817.22	-75.02	14.44	-60.58	-57.00	-3.58	HORIZONTAL
7	2,969.00	-70.05	7.30	-62.75	-47.00	-15.75	HORIZONTAL
8	5,541.00	-71.62	17.45	-54.17	-47.00	-7.17	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Model: BT840XE

Test Mode: BLE mode, RX CH Low

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	36.25	-64.14	6.41	-57.73	-57.00	-0.73	VERTICAL
2	85.00	-60.74	1.00	-59.74	-57.00	-2.74	VERTICAL
3	336.58	-64.53	5.18	-59.35	-57.00	-2.35	VERTICAL
4	602.31	-74.76	10.19	-64.57	-57.00	-7.57	VERTICAL
5	743.07	-79.39	13.73	-65.66	-57.00	-8.66	VERTICAL
6	816.87	-76.99	13.92	-63.07	-57.00	-6.07	VERTICAL
7	1,990.00	-64.88	4.60	-60.28	-47.00	-13.28	VERTICAL
8	5,399.00	-72.22	17.59	-54.63	-47.00	-7.63	VERTICAL
1	33.78	-68.45	9.65	-58.80	-57.00	-1.80	HORIZONTAL
2	109.52	-60.52	1.29	-59.23	-57.00	-2.23	HORIZONTAL
3	216.62	-60.45	2.41	-58.04	-57.00	-1.04	HORIZONTAL
4	337.19	-63.81	4.81	-59.00	-57.00	-2.00	HORIZONTAL
5	594.10	-77.41	11.08	-66.33	-57.00	-9.33	HORIZONTAL
6	740.47	-78.06	13.94	-64.12	-57.00	-7.12	HORIZONTAL
7	1,479.00	-65.68	2.28	-63.40	-47.00	-16.40	HORIZONTAL
8	5,260.00	-72.83	16.82	-56.01	-47.00	-9.01	HORIZONTAL

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High

Ambient temperature: 23°C

Relative humidity: 71%

Test Date: 2023/11/27

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	84.32	-60.06	1.00	-59.06	-57.00	-2.06	VERTICAL
2	216.38	-61.92	2.73	-59.19	-57.00	-2.19	VERTICAL
3	337.14	-64.26	5.18	-59.08	-57.00	-2.08	VERTICAL
4	740.84	-78.18	13.74	-64.44	-57.00	-7.44	VERTICAL
5	816.70	-75.58	13.92	-61.66	-57.00	-4.66	VERTICAL
6	947.77	-76.98	17.65	-59.33	-57.00	-2.33	VERTICAL
7	1,974.00	-67.13	4.50	-62.63	-47.00	-15.63	VERTICAL
8	4,941.00	-72.28	16.32	-55.96	-47.00	-8.96	VERTICAL
1	192.79	-60.29	1.70	-58.59	-57.00	-1.59	HORIZONTAL
2	246.74	-62.85	4.38	-58.47	-57.00	-1.47	HORIZONTAL
3	520.37	-73.45	9.08	-64.37	-57.00	-7.37	HORIZONTAL
4	666.04	-78.05	11.93	-66.12	-57.00	-9.12	HORIZONTAL
5	743.90	-76.94	14.04	-62.90	-57.00	-5.90	HORIZONTAL
6	817.23	-76.07	14.44	-61.63	-57.00	-4.63	HORIZONTAL
7	4,605.00	-71.61	14.95	-56.66	-47.00	-9.66	HORIZONTAL
8	6,531.00	-73.92	23.84	-50.08	-47.00	-3.08	HORIZONTAL

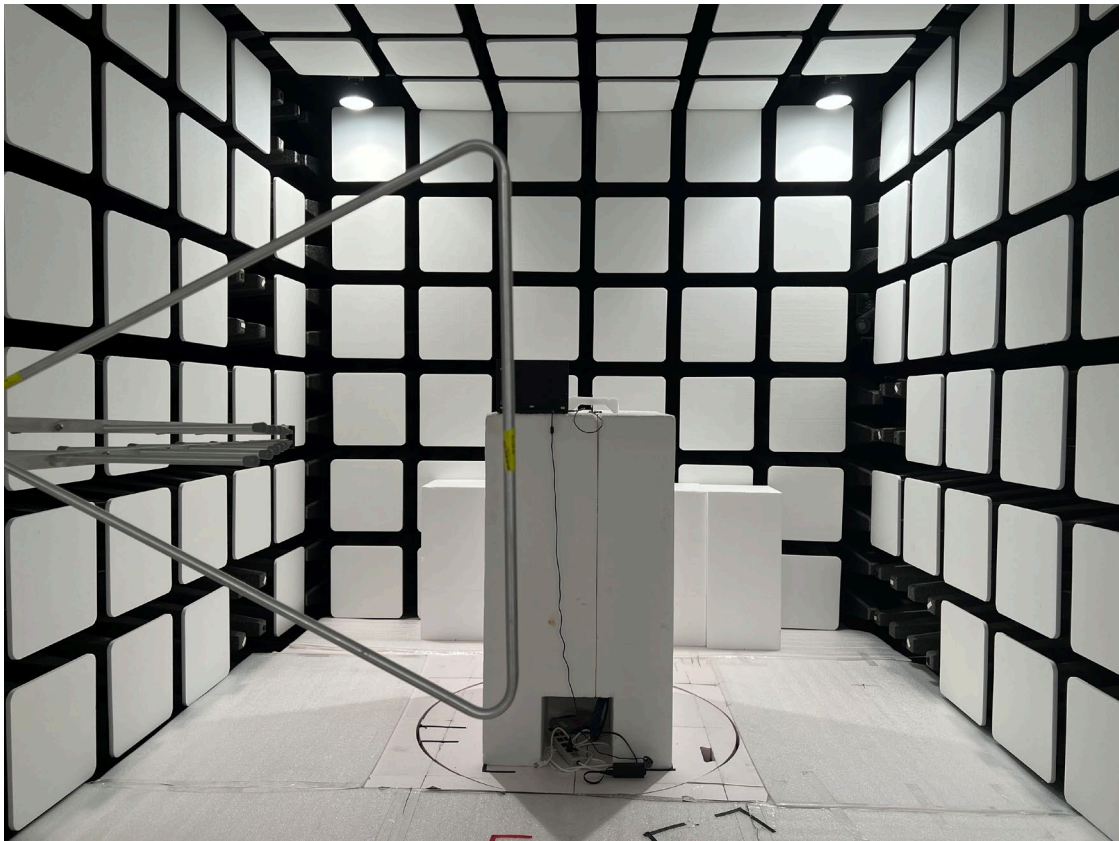
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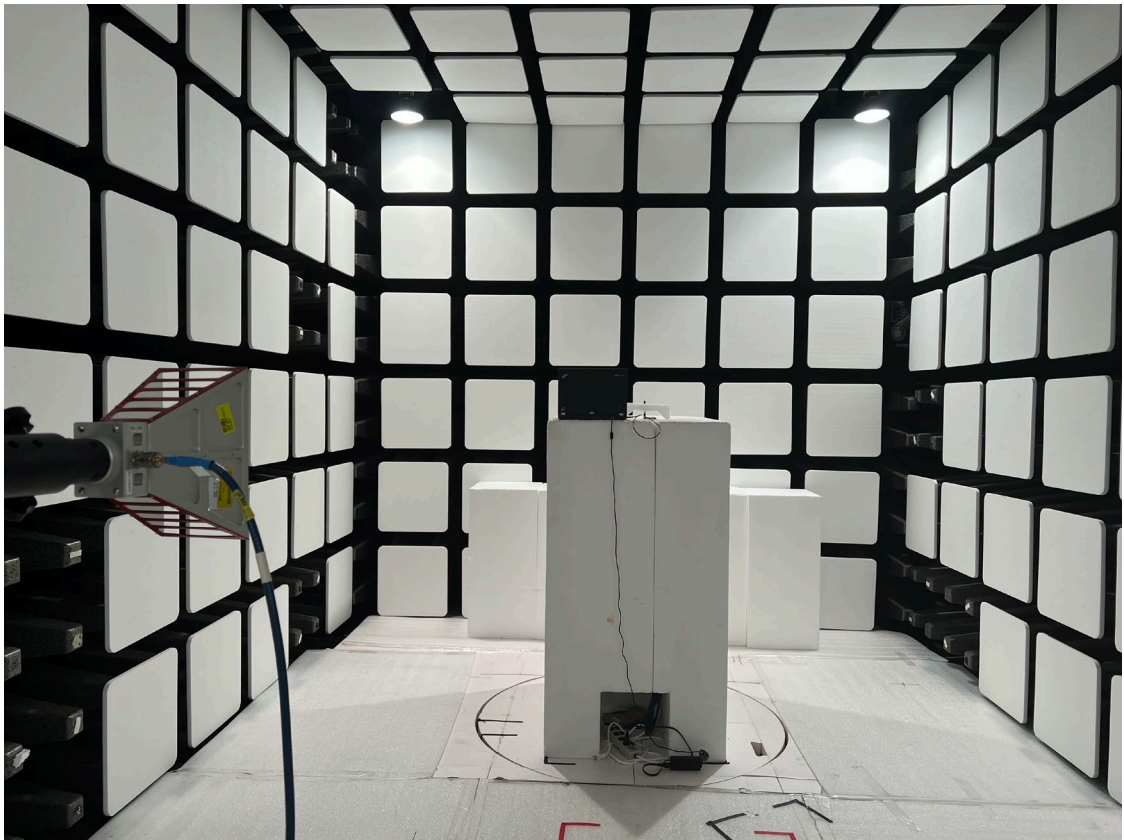
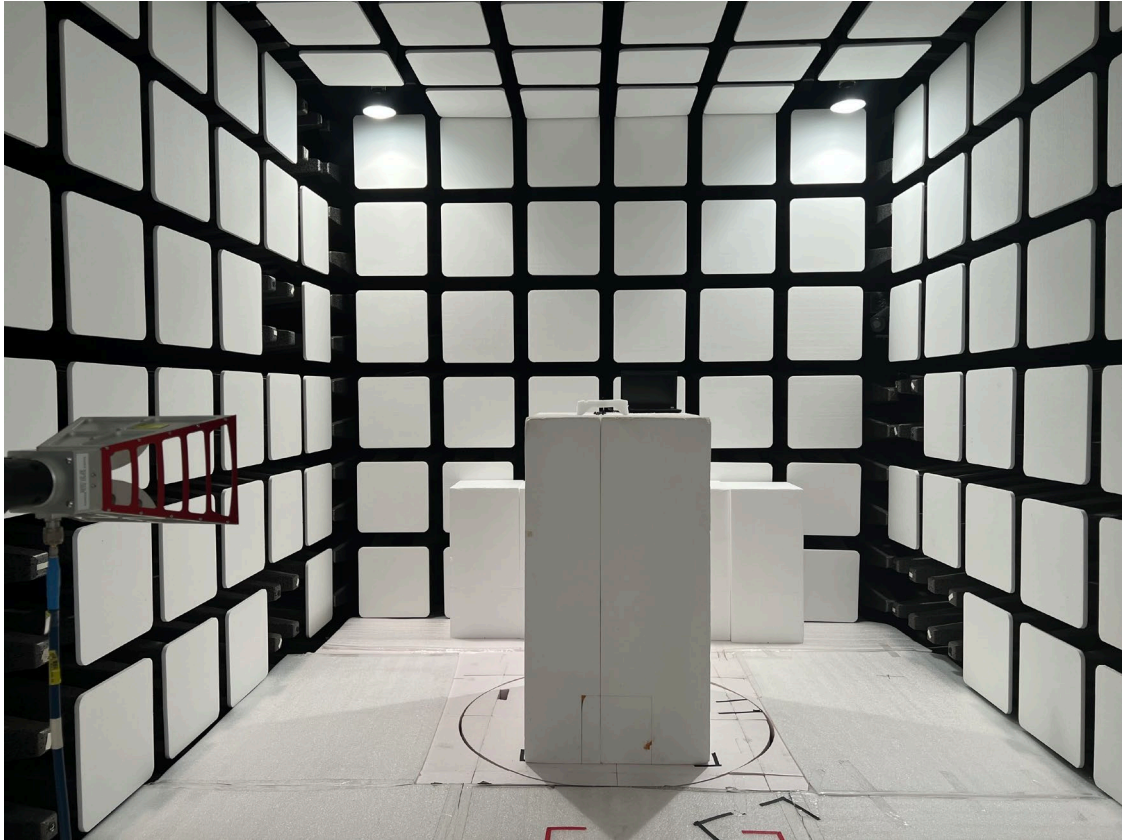
1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm) + Aux (dB)
5. Measurement Range upto 12.75GHz.

APPENDIX 1

PHOTOGRAPHS OF SET UP

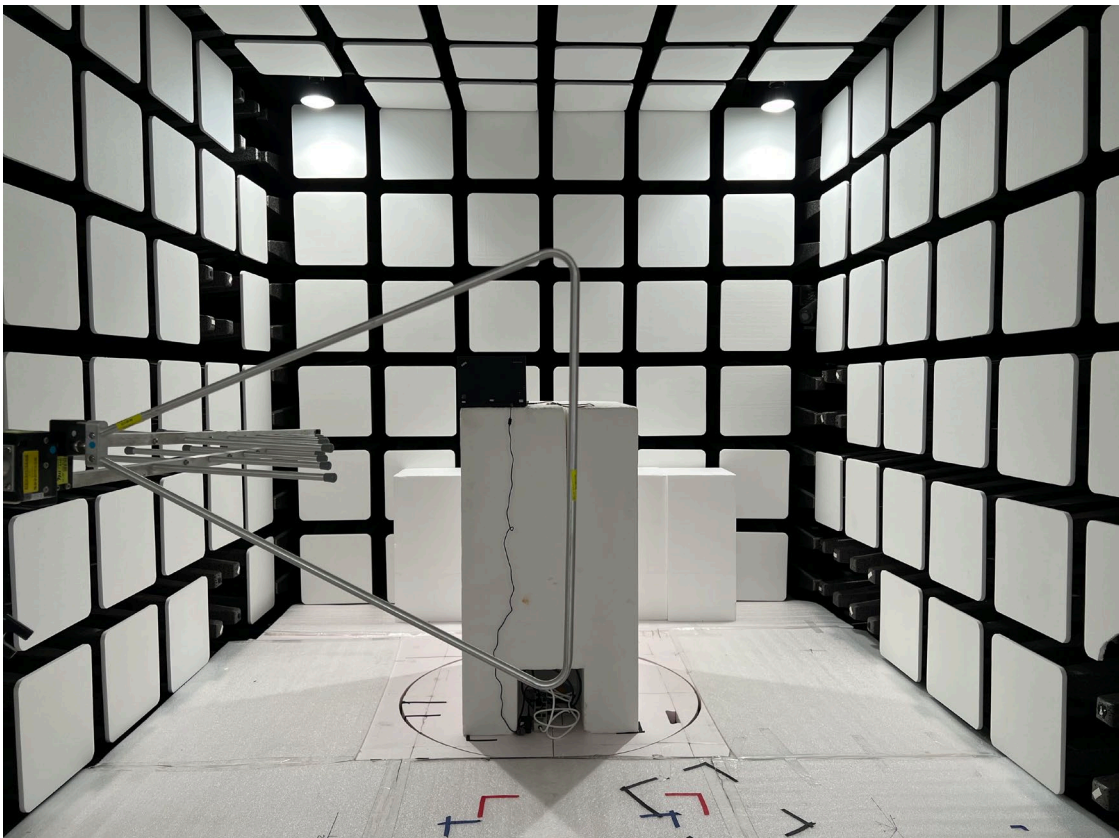
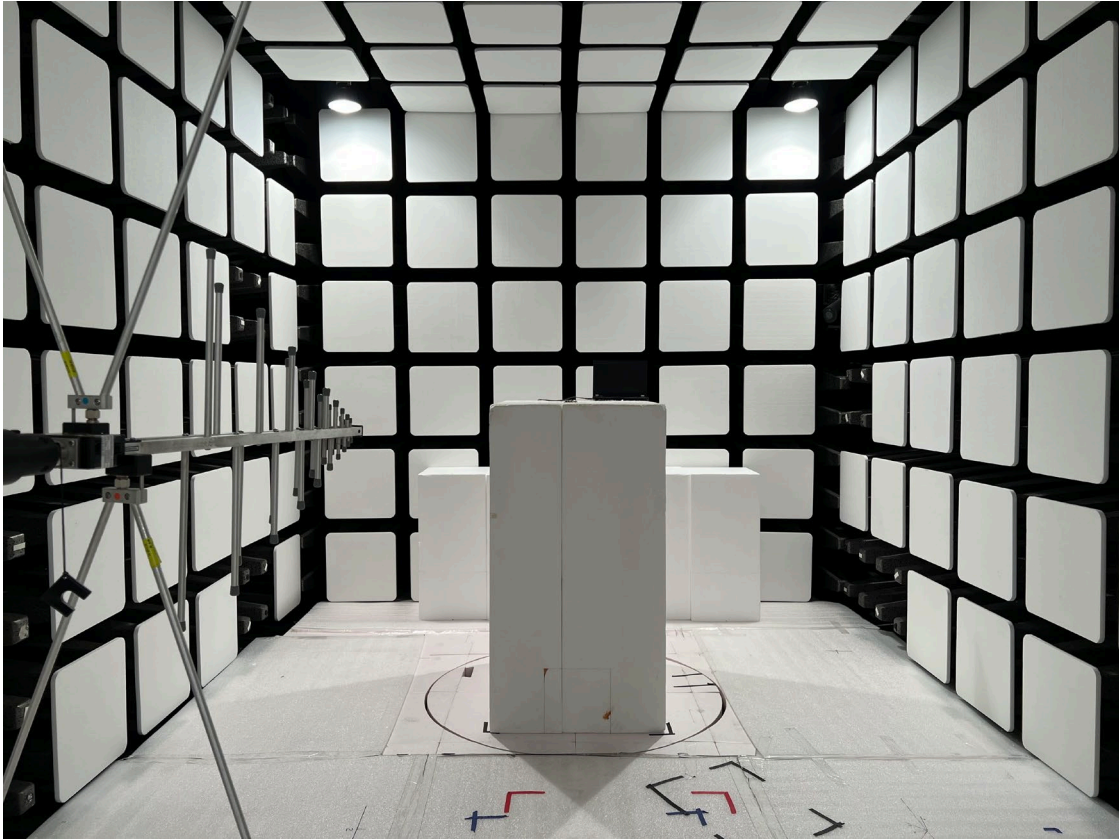
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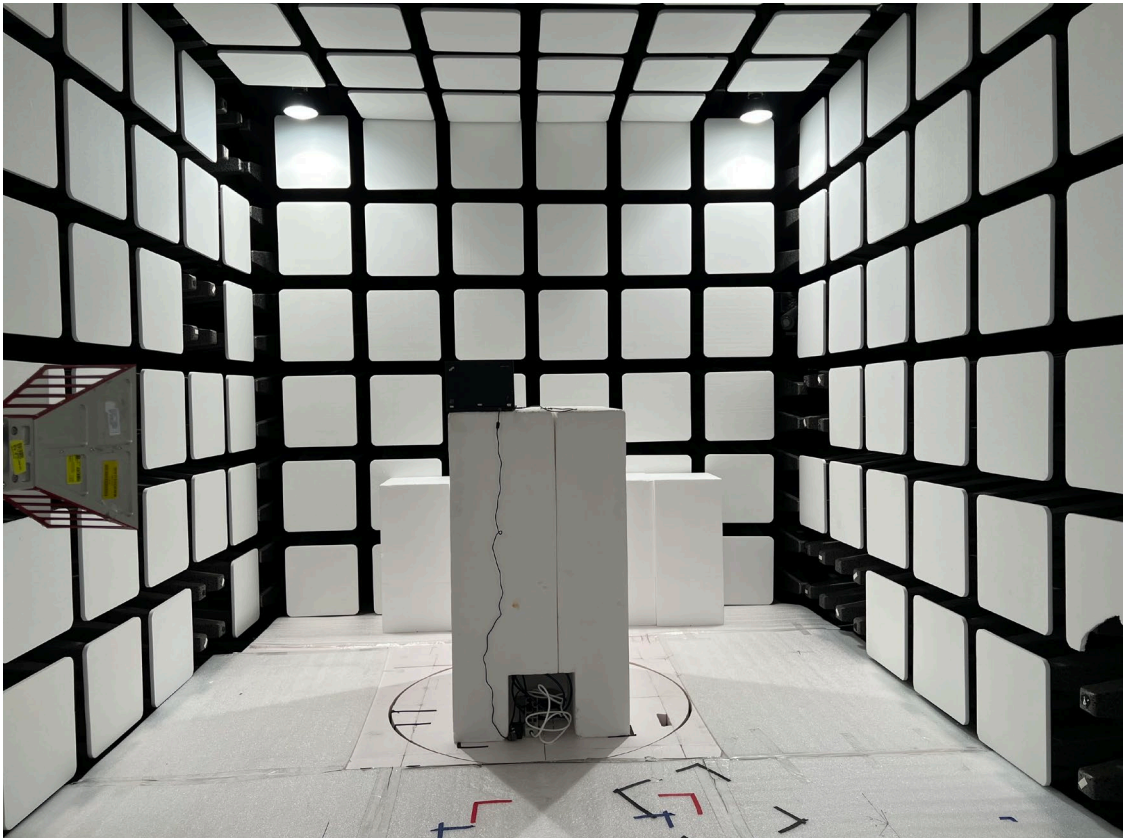
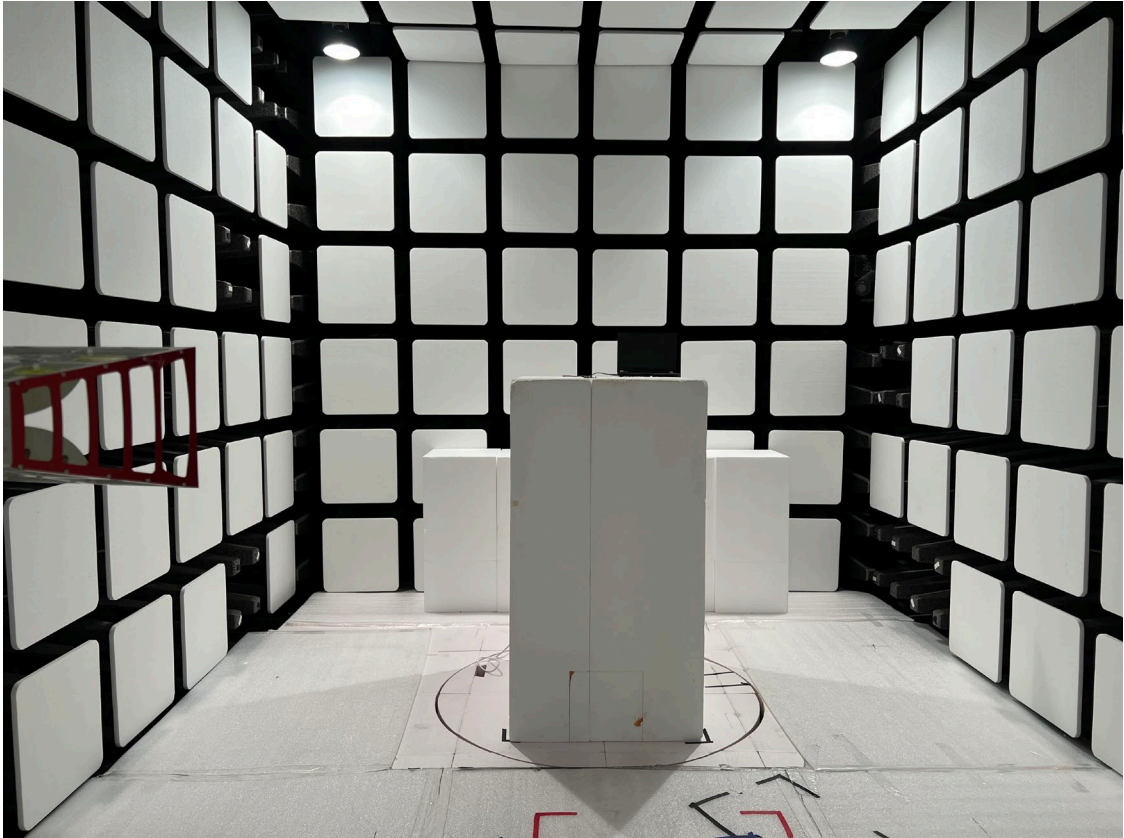


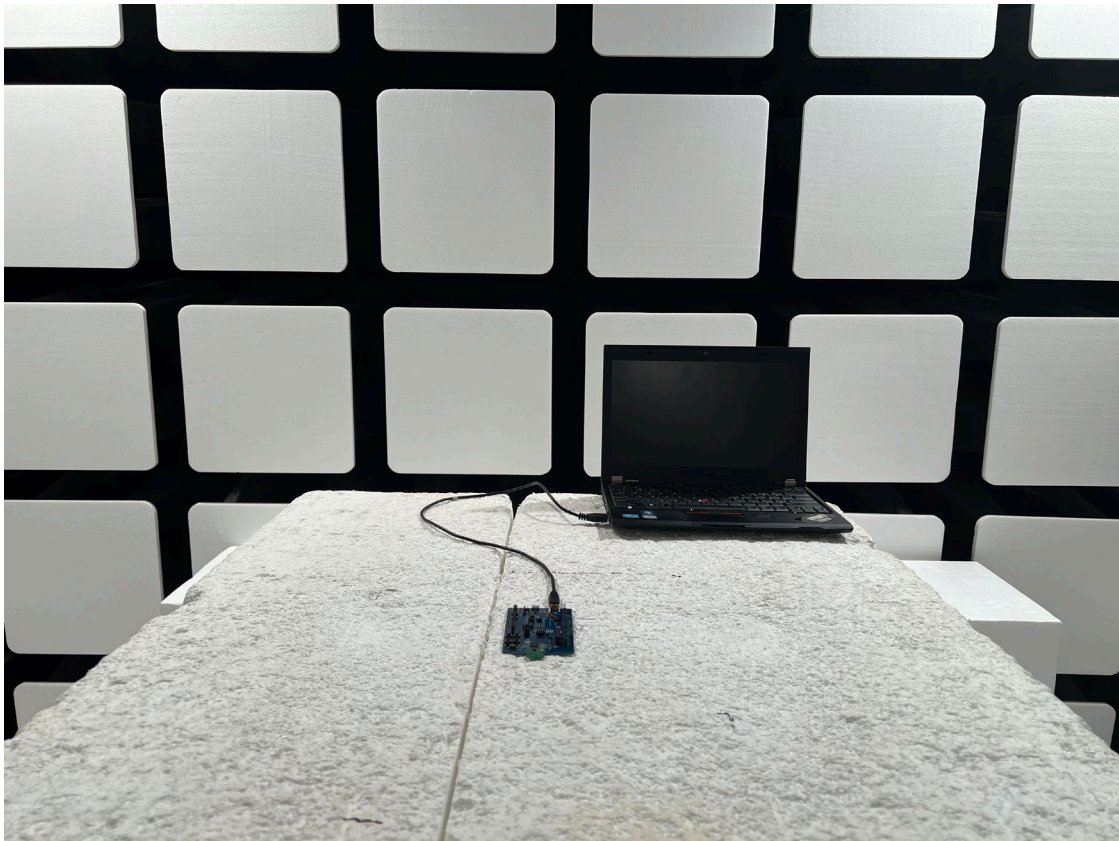




PCB Ant.







APPENDIX 2

PHOTOGRAPHS OF EUT

Please refer to the file ISL-19LR022P-R5

~ End of Report ~