TEST REPORT

Product Name	:	OBEX CONNECT
Brand Mark	:	POC
Model No.	:	OBEX CONNECT HEADSET
FCC ID	:	2BFFJ-PC70204
Report Number	:	BLA-EMC-202402-A2703
Date of Sample Receipt	:	2024/2/22
Date of Test	:	2024/2/26 to 2024/3/15
Date of Issue	:	2024/3/19
Test Standard	:	47 CFR Part 15, Subpart C 15.247
Test Result	:	Pass

Prepared for:

POC SWEDEN AB

Nackagatan 4, SE-11649,Stockholm, Sweden

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

TEL: +86-755-23059481

Compiled by: Lucas

Review by: Sweet

Approved by: Blue Zheng

Date: 2024/3/19

BlueAsia of Technical Services(Shenzhen) Co., Ltd. BLA

REPORT REVISE RECORD

Version No.	Date	Description
00	2024/3/19	Original

BlueAsia

TABLE OF CONTENTS

1 TEST SUMMARY 5

2 GENERAL INFORMATION 6

3 GENERAL DESCRIPTION OF E.U.T. 6

4 OPERATION FREQUENCY EACH OF CHANNEL 7

5 TEST ENVIRONMENT 8

6 TEST MODE 8

7 MEASUREMENT UNCERTAINTY 9

8 DESCRIPTION OF SUPPORT UNIT 10

9 TEST FACILITY 10

10 LABORATORY LOCATION 10

11 TEST INSTRUMENTS LIST 11

12 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ) 15

12.1 LIMITS 15
12.2 BLOCK DIAGRAM OF TEST SETUP 15
12.3 PROCEDURE 15
12.4 TEST DATA 17

13 CONDUCTED BAND EDGES MEASUREMENT 19

13.1 LIMITS 19
13.2 BLOCK DIAGRAM OF TEST SETUP 20
13.3 TEST DATA 20

14 RADIATED SPURIOUS EMISSIONS 21

14.1 LIMITS 21
14.2 BLOCK DIAGRAM OF TEST SETUP 22
14.3 PROCEDURE 22
14.4 TEST DATA 24

15 ANTENNA REQUIREMENT 32

15.1 CONCLUSION 32

16 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS 33

16.1 LIMITS 33

BlueAsia

16.2 BLOCK DIAGRAM OF TEST SETUP 34
16.3 PROCEDURE 34
16.4 TEST DATA 36

17 CONDUCTED SPURIOUS EMISSIONS 40

17.1 LIMITS 40
17.2 BLOCK DIAGRAM OF TEST SETUP 41
17.3 TEST DATA 41

18 POWER SPECTRUM DENSITY 42

18.1 LIMITS 42
18.2 BLOCK DIAGRAM OF TEST SETUP 42
18.3 TEST DATA 42

19 CONDUCTED PEAK OUTPUT POWER 43

19.1 LIMITS 43
19.2 BLOCK DIAGRAM OF TEST SETUP 43
19.3 TEST DATA 44

20 MINIMUM 6DB BANDWIDTH 45

20.1 LIMITS 45
20.2 BLOCK DIAGRAM OF TEST SETUP 45
20.3 TEST DATA 45

21 APPENDIX 46

21.1 MAXIMUM CONDUCTED OUTPUT POWER 46
21.2 -6DB BANDWIDTH 48
21.3 OCCUPIED CHANNEL BANDWIDTH 50
21.4 MAXIMUM POWER SPECTRAL DENSITY LEVEL 52
21.5 BAND EDGE 54
21.6 CONDUCTED RF SPURIOUS EMISSION 57

APPENDIX A: PHOTOGRAPHS OF TEST SETUP 61

APPENDIX B: PHOTOGRAPHS OF EUT 63

BlueAsia

1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass

BlueAsia

2 GENERAL INFORMATION

Applicant	POC SWEDEN AB
Address	Nackagatan 4, SE-11649,Stockholm, Sweden
Manufacturer	Guoguang Electric Co., Ltd.
Address	No.8 Jinghu Road, Xinya Street, Huadu Reg, Guangzhou, Guangdong, P.R. China
Factory	Onward Helmet Company Limited
Address	No.268 Yinhe North Road, South-West Industry Zone, Shijie Town, Dongguan City, Guangdong Province
Product Name	OBEX CONNECT
Test Model No.	OBEX CONNECT HEADSET

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	V1.3
Software Version	POC_DVT_01.00.77
Engineer sample no:	BLA-EMC-202402-A27

Operation Frequency:	2402MHz-2480MHz
Modulation Type:	GFSK
Data Rata	1Mbps
Channel Spacing:	2MHz
Number of Channels:	40
Antenna Type:	PCB Antenna
Antenna Gain:	1.3dBi(Provided by the customer)

BlueAsia

4 OPERATION FREQUENCY EACH OF CHANNEL

BLE:

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

BlueAsia

5 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25℃	3.8Vdc

6 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
TX	Keep the EUT in transmitting mode
Remark:Only the data of the worst mode would be recorded in this report.	

BlueAsia

7 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %
Radiated Emission(9kHz-30MHz)	±4.34dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB
Unwanted Radiated Emission (30MHz ~ 1000MHz)	±4.35 dB
Unwanted Radiated Emission (1GHz ~ 18GHz)	±4.44 dB

BlueAsia

8 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
AC Adapter	UGREEN	CD112	N/A	N/A
PC	lenovo	E460C	N/A	From lab (No.BLA-ZC-BS-2022005)

9 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

● FCC — Designation No.: CN1252

BlueAsia of Technical Services(Shenzhen) Co., Ltd has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Designation CN1252.

●ISED — CAB identifier No.: CN0028

BlueAsia of Technical Services(Shenzhen) Co., Ltd has been registered by Certification and Engineering Bureau of ISED for radio equipment testing with CAB identifier CN0028.

10 LABORATORY LOCATION

All tests were performed at:

BlueAsia of Technical Services(Shenzhen) Co., Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

No tests were sub-contracted.

BlueAsia

11 TEST INSTRUMENTS LIST

Test Equipment Of Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Chamber 1	SKET	966	N/A	2023/11/16	2026/11/15
Chamber 2	SKET	966	N/A	2021/07/20	2024/7/19
Spectrum	R&S	FSP40	100817	2023/08/30	2024/08/29
Receiver	R&S	ESR7	101199	2023/08/30	2024/08/29
Receiver	R&S	ESPI7	101477	2023/07/07	2024/07/06
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2022/10/12	2025/10/11
Horn Antenna	Schwarzbeck	BBHA9120D	01892 P:00331	2022/09/13	2025/09/12
Horn Antenna	Schwarzbeck	BBHA 9170	1106	2022/04/24	2024/04/23
Amplifier	SKET	LNPA_30M01G-30	SK2021060801	2023/07/07	2024/07/06
Amplifier	SKET	PA-000318G-45	N/A	2023/08/30	2024/08/29
Amplifier	SKET	LNPA_18G40G-50	SK2022071301	2023/07/14	2024/07/13
Filter group	SKET	2.4G/5G Filter group r	N/A	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2022/09/14	2025/09/13
1kHZ calibration audio source	SKET	MCS-ABT-C35	N/A	2023/09/04	2024/09/03
Free Field Microphone	SKET	MGS MP 663	0414	2023/09/04	2024/09/03
Audio shielding box	SKET	SB-ABT-C35	N/A	2023/03/30	2024/03/29
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A

BlueAsia

Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A
Signal Generator DTV	ECREDIX	DSG-1000	N/A	N/A	N/A

BlueAsia

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Shield room	SKET	833	N/A	2023/11/16	2025/11/15
Receiver	R&S	ESPI3	101082	2023/08/30	2024/08/29
LISN	R&S	ENV216	3560.6550.15	2023/08/30	2024/08/29
LISN	AT	AT166-2	AKK1806000003	2023/08/30	2024/08/29
ISN	TESEQ	ISNT8-cat6	53580	2023/08/30	2024/08/29
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01045	2023/07/07	2024/07/06
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01075	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

Test Equipment Of RF Conducted Test					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2023/08/30	2024/08/29
Spectrum	Agilent	N9020A	MY49100060	2023/08/30	2024/08/29
Spectrum	Agilent	N9020A	MY54420161	2023/08/30	2024/08/29
Signal Generator	Agilent	N5182A	MY47420955	2023/08/30	2024/08/29
Signal Generator	Agilent	N5181A	MY46240904	2023/07/07	2024/07/06
Signal Generator	R&S	CMW500	132429	2023/08/30	2024/08/29
BluetoothTester	Anritsu	MT8852B	06262047872	2023/08/30	2024/08/29
Power probe	DARE	RPR3006W	14I00889SN042	2023/09/01	2024/08/31
Power detection box	CDKMV	MW100-PSB	MW201020JYT	2023/07/07	2024/07/06
DCPowersupply	zhaoxin	KXN-305D	20K305D1221363	2023/08/30	2024/08/29
DCPowersupply	zhaoxin	RXN-1505D	19R1505D050168	2023/08/30	2024/08/29

2.4GHz/5GHz RF Test software	MTS	MTS 8310	Version 2.0.0.0	N/A	N/A
Audio Analyzer	Audio Precision	ATS-1	ATS141094	2023/07/07	2024/07/06

BlueAsia

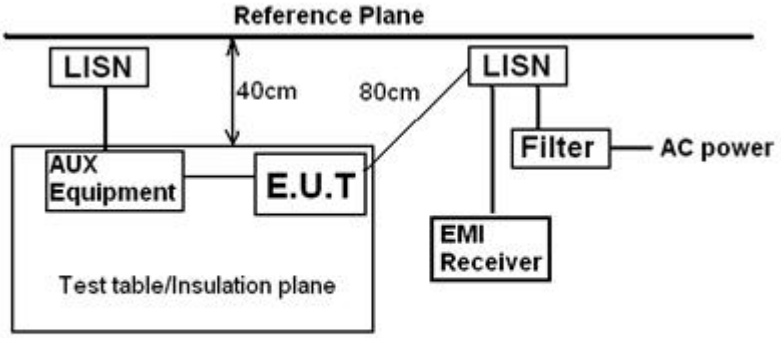
12 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Nikki
Temperature	23℃
Humidity	50%

12.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		

12.2 BLOCK DIAGRAM OF TEST SETUP



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

12.3 PROCEDURE

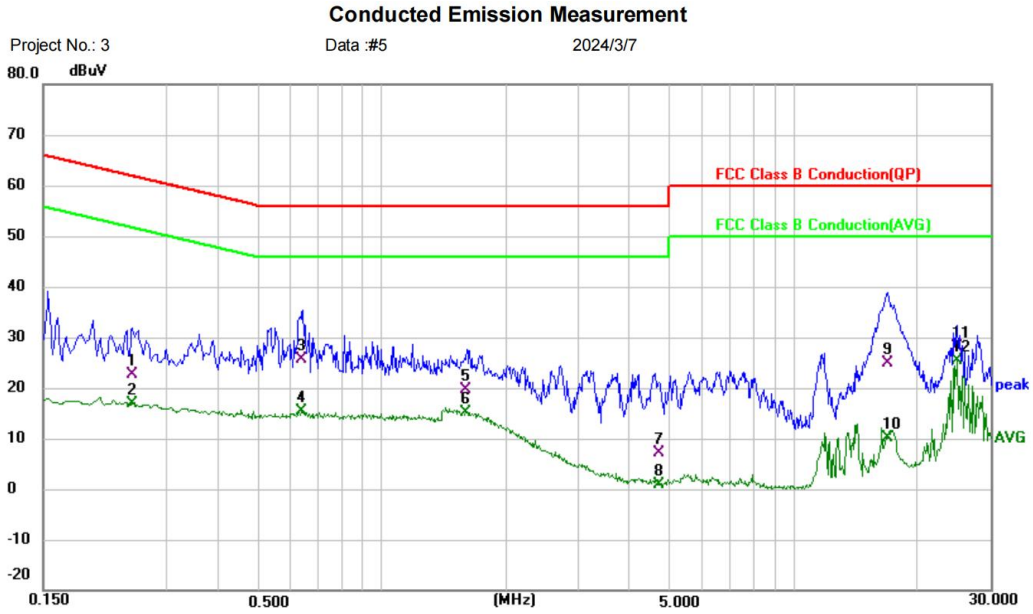
1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Remark: LISN=Read Level+ Cable Loss+ LISN Factor

BlueAsia

12.4 TEST DATA

[TestMode: TX]; [Line: Line];[Power:AC120V/60Hz]

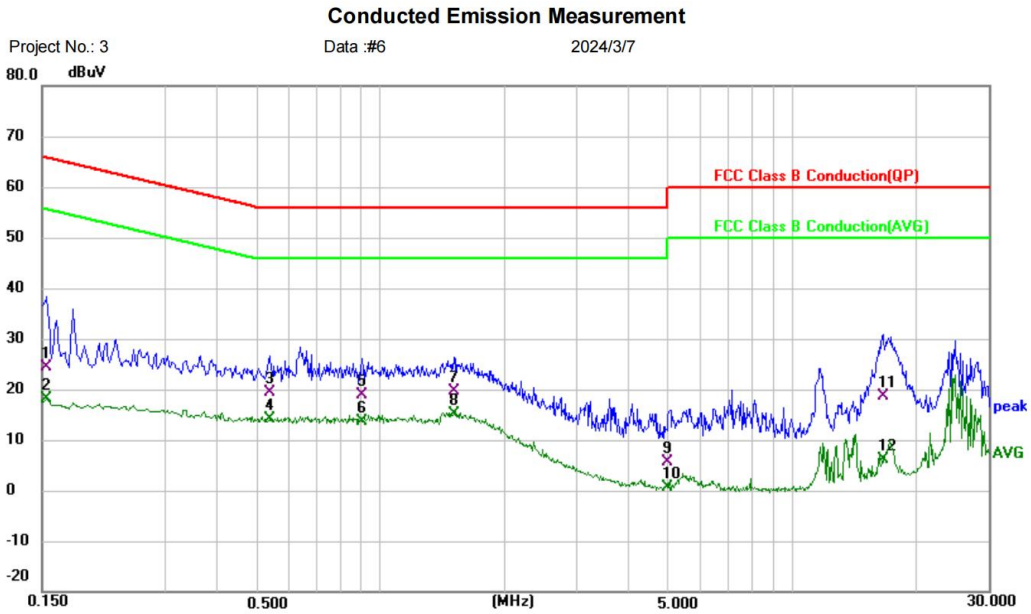


Site		Phase:	*L1*	Temperature:	(C)
Limit: FCC Class B Conduction(QP)		Power:		Humidity:	%RH
EUT: POC OBEX CONNECT		Distance:	RBW: 9 KHz		
M/N: OBEX CONNECT			VBW: 30 KHz	Sweep Time: 10 ms	
Mode: BLE TX mode					
Note:					

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.2460	12.01	10.53	22.54	61.89	-39.35	QP			
2		0.2460	6.36	10.53	16.89	51.89	-35.00	AVG			
3		0.6419	15.74	9.96	25.70	56.00	-30.30	QP			
4		0.6419	5.35	9.96	15.31	46.00	-30.69	AVG			
5		1.6019	9.59	10.01	19.60	56.00	-36.40	QP			
6		1.6019	5.08	10.01	15.09	46.00	-30.91	AVG			
7		4.7180	-2.96	10.18	7.22	56.00	-48.78	QP			
8		4.7180	-9.42	10.18	0.76	46.00	-45.24	AVG			
9		16.8500	11.10	13.73	24.83	60.00	-35.17	QP			
10		16.8500	-3.58	13.73	10.15	50.00	-39.85	AVG			
11		24.9619	13.16	15.03	28.19	60.00	-31.81	QP			
12	*	24.9619	10.31	15.03	25.34	50.00	-24.66	AVG			

Test Result: Pass

[TestMode: TX]; [Line: Neutral];[Power:AC120V/60Hz]



Site		Phase:	N	Temperature:	(C)
Limit: FCC Class B Conduction(QP)		Power:		Humidity:	%RH
EUT: POC OBEX CONNECT		Distance:	RBW: 9 KHz		
M/N: OBEX CONNECT			VBW: 30 KHz	Sweep Time: 10 ms	
Mode: BLE TX mode					
Note:					

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.1539	14.24	10.19	24.43	65.79	-41.36	QP			
2		0.1539	7.99	10.19	18.18	55.79	-37.61	AVG			
3		0.5340	9.54	9.83	19.37	56.00	-36.63	QP			
4		0.5340	4.29	9.83	14.12	46.00	-31.88	AVG			
5		0.9020	8.91	9.88	18.79	56.00	-37.21	QP			
6		0.9020	3.77	9.88	13.65	46.00	-32.35	AVG			
7		1.5100	9.75	9.94	19.69	56.00	-36.31	QP			
8	*	1.5100	5.08	9.94	15.02	46.00	-30.98	AVG			
9		4.9860	-4.85	10.36	5.51	56.00	-50.49	QP			
10		4.9860	-9.71	10.36	0.65	46.00	-45.35	AVG			
11		16.5980	5.01	13.55	18.56	60.00	-41.44	QP			
12		16.5980	-7.37	13.55	6.18	50.00	-43.82	AVG			

Test Result: Pass

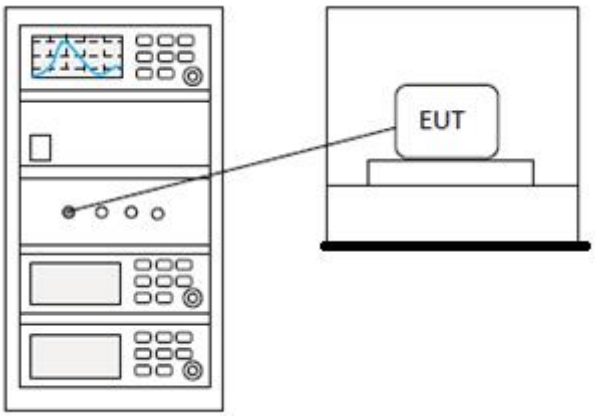
13 CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Nikki
Temperature	23℃
Humidity	50%

13.1 LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated 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) (see §15.205(c)).

13.2 BLOCK DIAGRAM OF TEST SETUP



13.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

BlueAsia

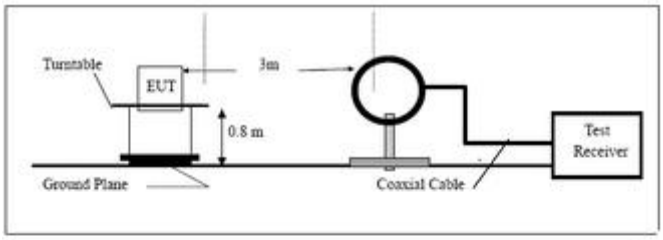
14 RADIATED SPURIOUS EMISSIONS

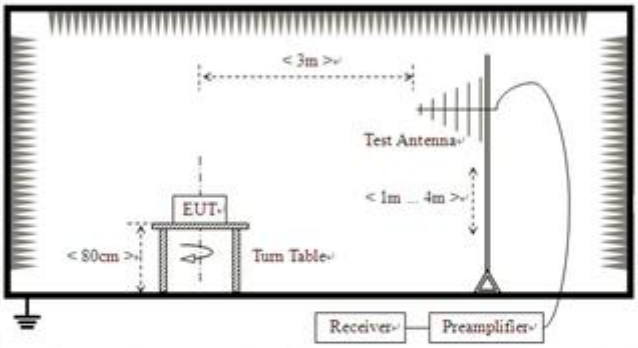
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Nikki
Temperature	23℃
Humidity	50%

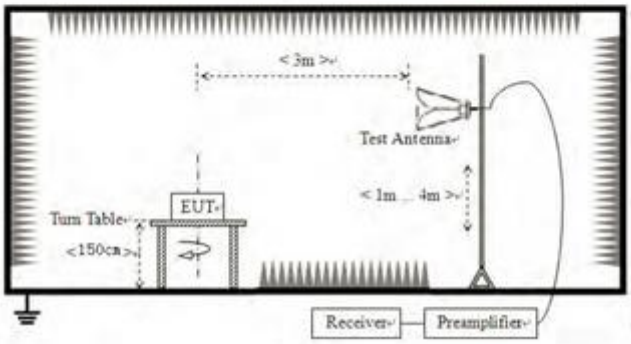
14.1 LIMITS

Frequency(MHz)	Field strength(microvolts/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
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

14.2 BLOCK DIAGRAM OF TEST SETUP







14.3 PROCEDURE

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

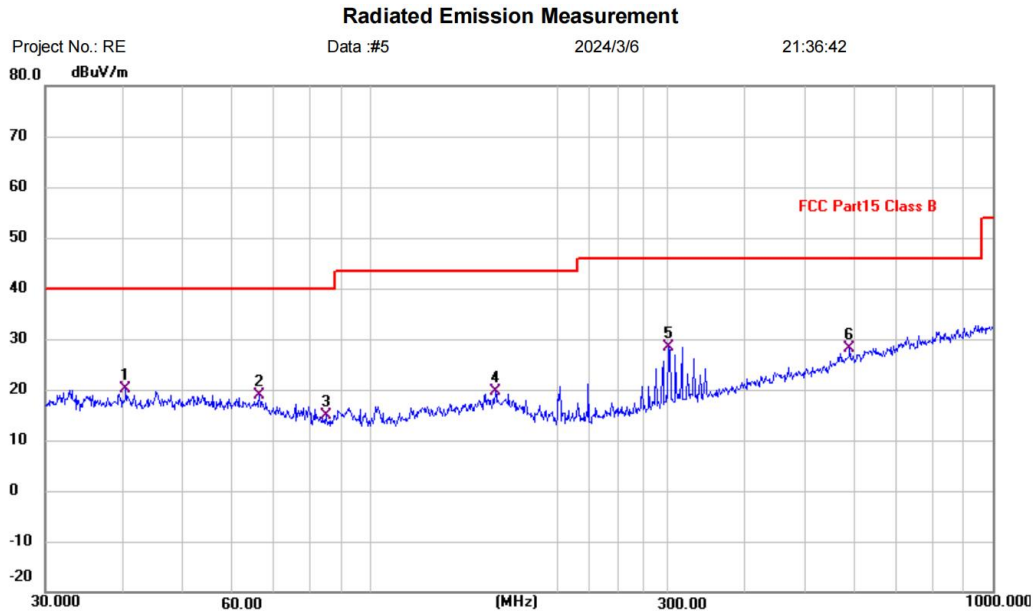
Remark:
1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.fundamental frequency is blocked by filter, and only spurious emission is shown.
4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

BlueAsia

14.4 TEST DATA

Below 1GHz

[TestMode: TX]; [Polarity: Horizontal]



Site
Limit: FCC Part15 Class B
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX mode
Note:

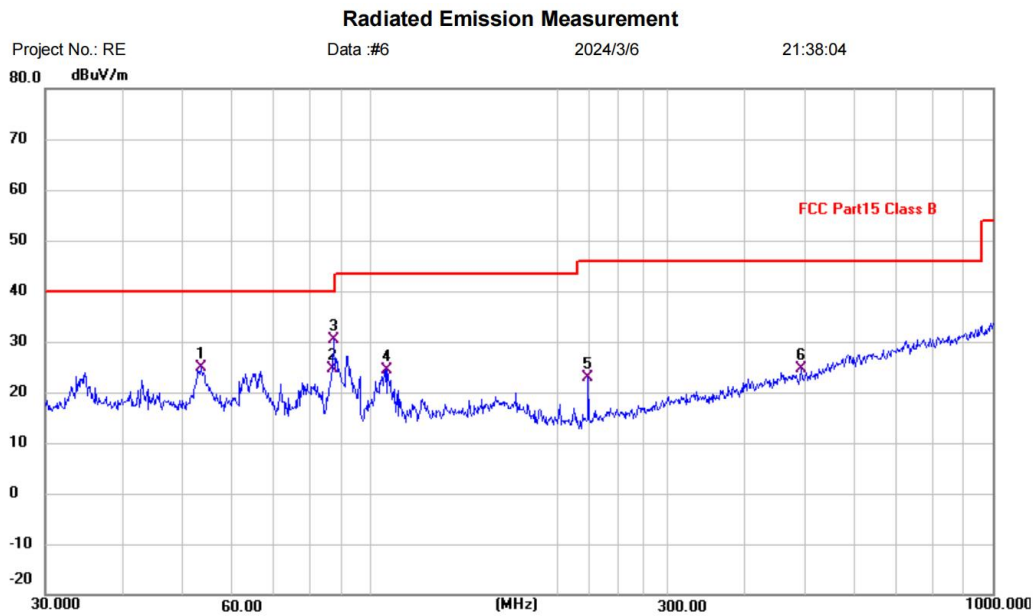
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	40.4170	0.33	19.80	20.13	40.00	-19.87	QP	P	
2	66.2661	1.32	17.57	18.89	40.00	-21.11	QP	P	
3	84.7019	0.06	14.92	14.98	40.00	-25.02	QP	P	
4	158.6677	0.06	19.51	19.57	43.50	-23.93	QP	P	
5 *	301.4223	9.03	19.44	28.47	46.00	-17.53	QP	P	
6	588.9050	1.63	26.40	28.03	46.00	-17.97	QP	P	

Test Result: Pass

[TestMode: TX]; [Polarity: Vertical]



Site
Limit: FCC Part15 Class B
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX mode
Note:

Polarization: ***Vertical***
Power:

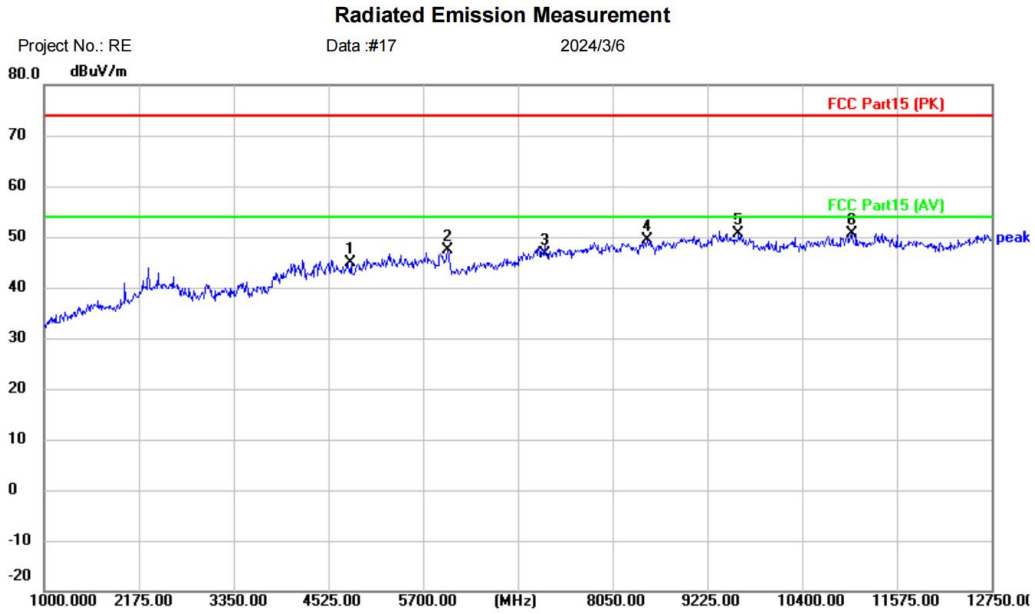
Temperature: (C)
Humidity: %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	53.3179	5.56	19.21	24.77	40.00	-15.23	QP	P	
2	86.8068	9.97	14.60	24.57	40.00	-15.43	QP	P	
3 *	87.1117	15.65	14.69	30.34	40.00	-9.66	QP	P	
4	106.3850	8.26	16.01	24.27	43.50	-19.23	QP	P	
5	223.7334	7.25	15.62	22.87	46.00	-23.13	QP	P	
6	492.4685	0.99	23.68	24.67	46.00	-21.33	QP	P	

Test Result: Pass

Above 1GHz:

[TestMode: TX low channel]; [Polarity: Horizontal]

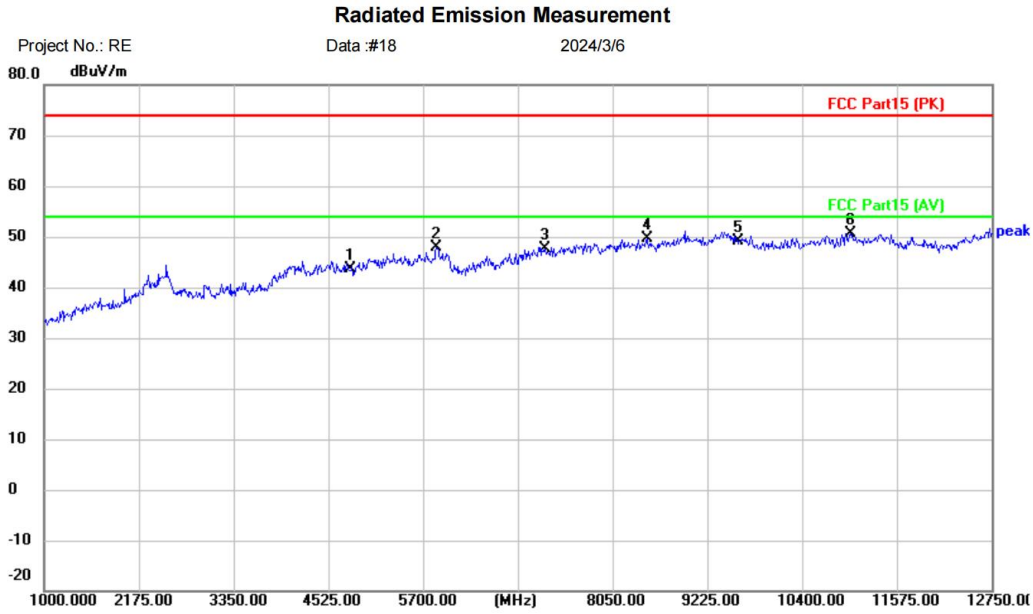


Site	Polarization: ***Horizontal***	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: POC OBEX CONNECT		
M/N: OBEX CONNECT		
Mode: BLE TX-2402		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	39.12	5.64	44.76	74.00	-29.24	peak	
2		6005.500	41.77	5.61	47.38	74.00	-26.62	peak	
3		7206.000	37.49	9.24	46.73	74.00	-27.27	peak	
4		8473.000	38.52	10.77	49.29	74.00	-24.71	peak	
5	*	9608.000	38.42	12.31	50.73	74.00	-23.27	peak	
6		11011.00	37.31	13.40	50.71	74.00	-23.29	peak	

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2402
Note:

Polarization: ***Vertical***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	37.96	5.64	43.60	74.00	-30.40	peak	
2		5864.500	39.37	8.48	47.85	74.00	-26.15	peak	
3		7206.000	38.38	9.24	47.62	74.00	-26.38	peak	
4		8473.000	38.92	10.77	49.69	74.00	-24.31	peak	
5		9608.000	36.84	12.31	49.15	74.00	-24.85	peak	
6	*	10999.25	37.11	13.48	50.59	74.00	-23.41	peak	

Test Result: Pass

[TestMode: TX middle channel]; [Polarity: Horizontal]

Radiated Emission Measurement

Project No.: RE Data :#23 2024/3/6

Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2442
Note:

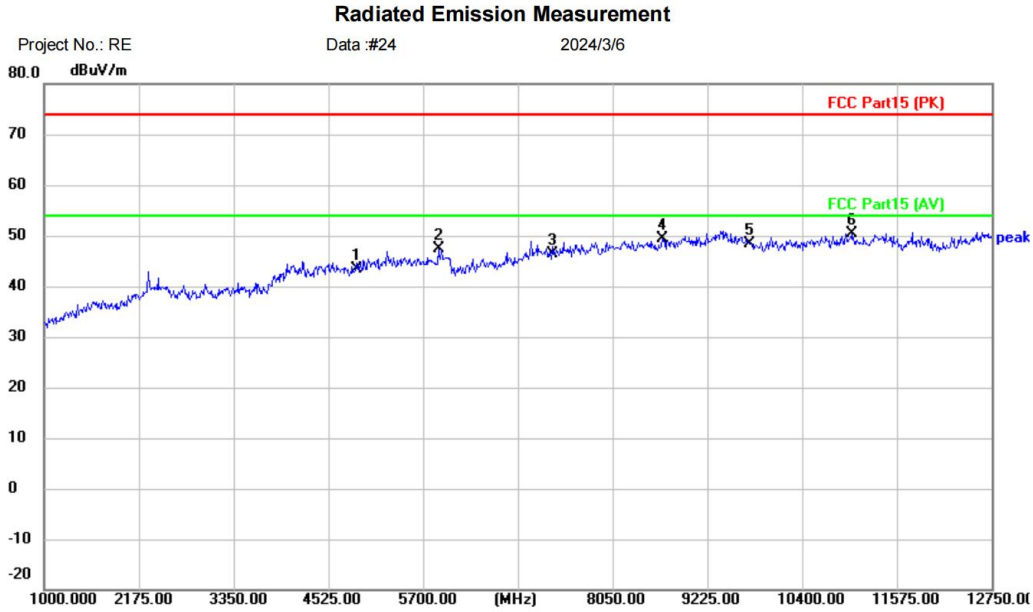
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4884.000	38.02	5.72	43.74	74.00	-30.26	peak	
2		5852.750	37.81	8.42	46.23	74.00	-27.77	peak	
3		7326.000	37.05	9.43	46.48	74.00	-27.52	peak	
4		8238.000	39.42	9.86	49.28	74.00	-24.72	peak	
5		9768.000	36.94	12.21	49.15	74.00	-24.85	peak	
6	*	11304.75	38.15	12.70	50.85	74.00	-23.15	peak	

Test Result: Pass

[TestMode: TX middle channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2442
Note:

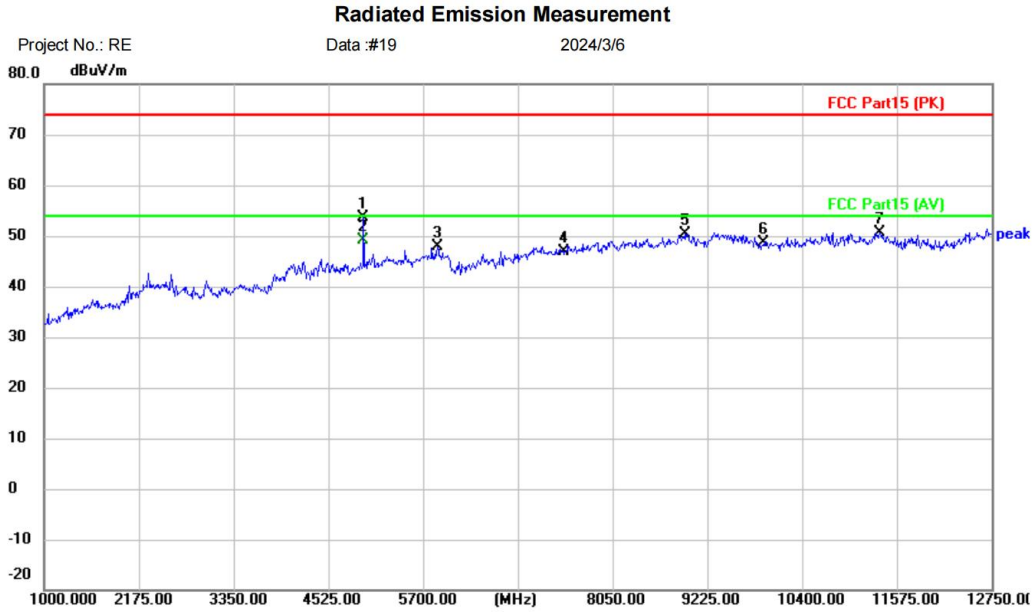
Polarization: ***Vertical***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.000	37.72	5.72	43.44	74.00	-30.56	peak	
2		5888.000	38.81	8.60	47.41	74.00	-26.59	peak	
3		7326.000	36.84	9.43	46.27	74.00	-27.73	peak	
4		8661.000	37.99	11.34	49.33	74.00	-24.67	peak	
5		9768.000	36.09	12.21	48.30	74.00	-25.70	peak	
6	*	11011.00	36.96	13.40	50.36	74.00	-23.64	peak	

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2480
Note:

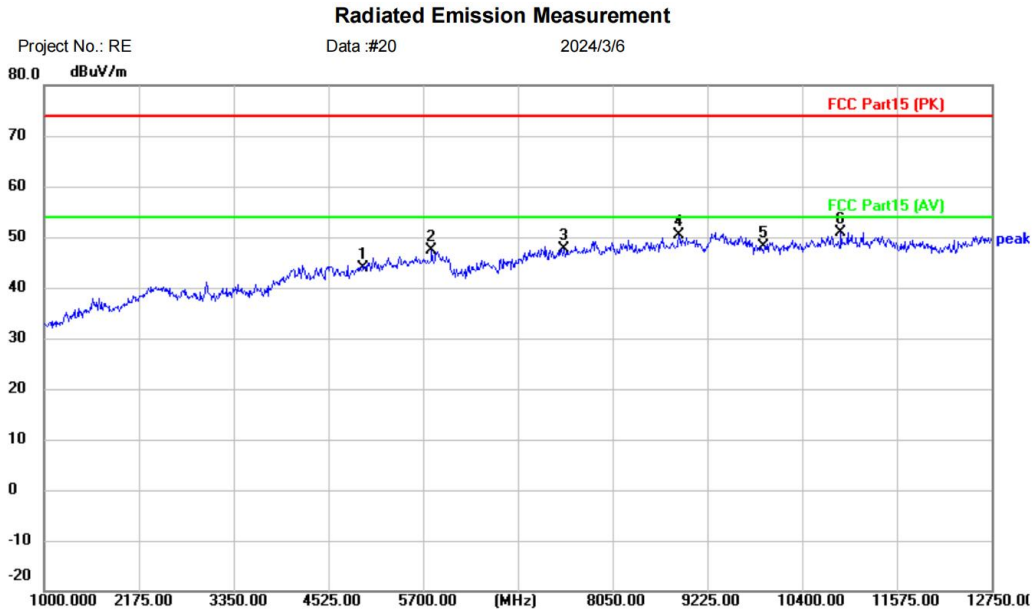
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4959.750	47.03	6.60	53.63	74.00	-20.37	peak	
2	*	4959.750	42.59	6.60	49.19	54.00	-4.81	AVG	
3		5876.250	39.30	8.54	47.84	74.00	-26.16	peak	
4		7440.000	37.31	9.64	46.95	74.00	-27.05	peak	
5		8943.000	38.23	12.23	50.46	74.00	-23.54	peak	
6		9920.000	36.51	12.14	48.65	74.00	-25.35	peak	
7		11363.50	37.92	12.65	50.57	74.00	-23.43	peak	

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2480
Note:

Polarization: ***Vertical***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	37.25	6.60	43.85	74.00	-30.15	peak	
2		5805.750	39.36	7.99	47.35	74.00	-26.65	peak	
3		7440.000	37.92	9.64	47.56	74.00	-26.44	peak	
4		8872.500	38.36	11.91	50.27	74.00	-23.73	peak	
5		9920.000	35.91	12.14	48.05	74.00	-25.95	peak	
6	*	10881.75	37.86	13.05	50.91	74.00	-23.09	peak	

Test Result: Pass

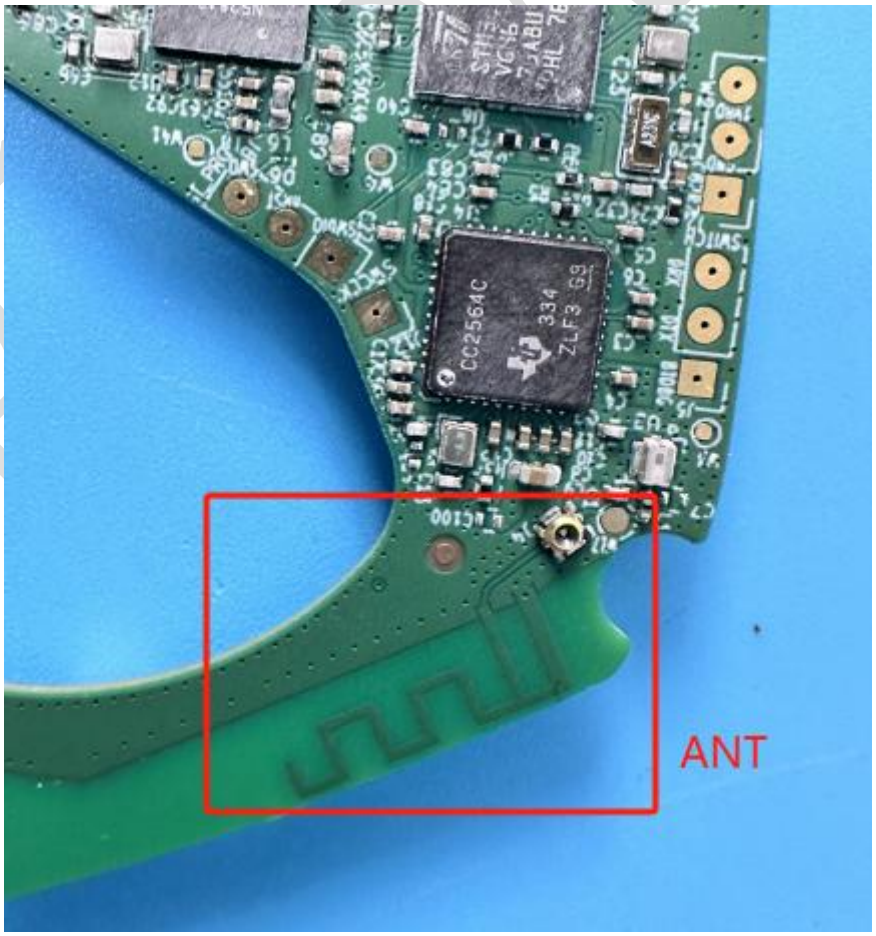
15 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

15.1 CONCLUSION

Standard Requirement:
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. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.3dBi.



16 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

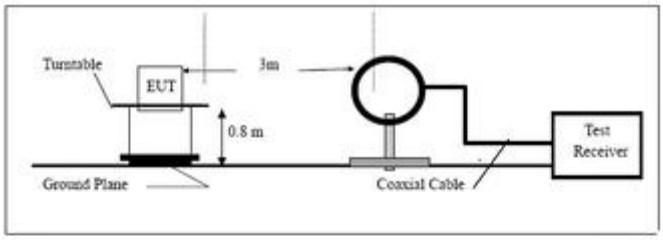
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Nikki
Temperature	23℃
Humidity	50%

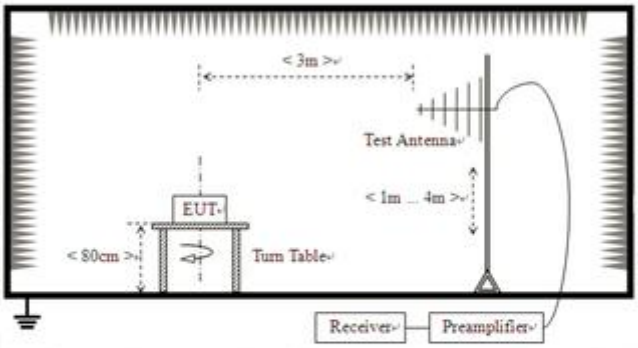
16.1 LIMITS

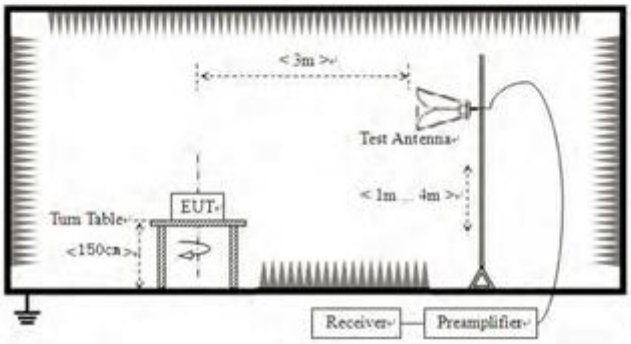
Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

BlueAsia

16.2 BLOCK DIAGRAM OF TEST SETUP







16.3 PROCEDURE

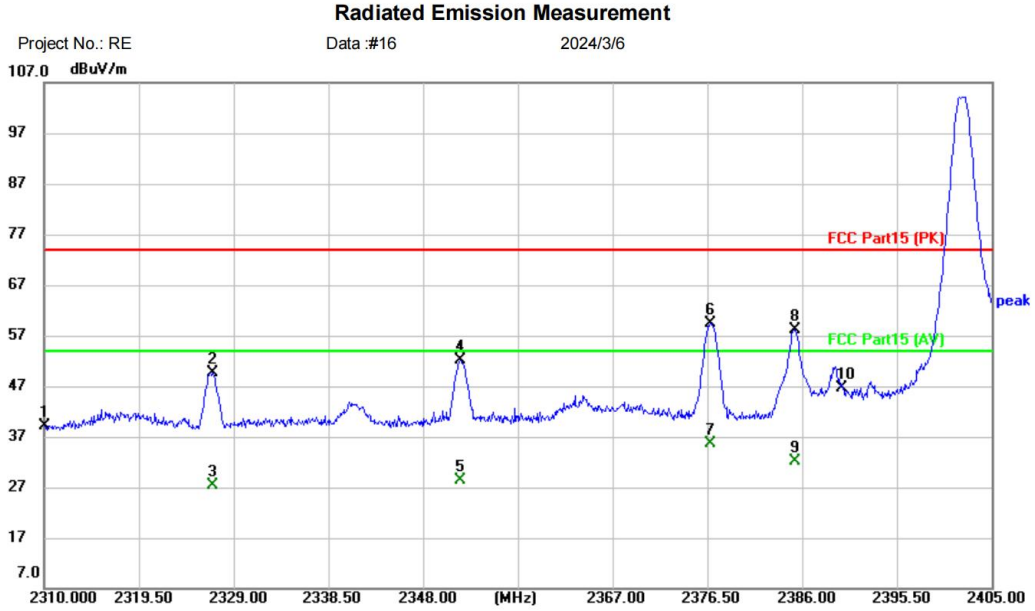
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

BlueAsia

16.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2402
Note:

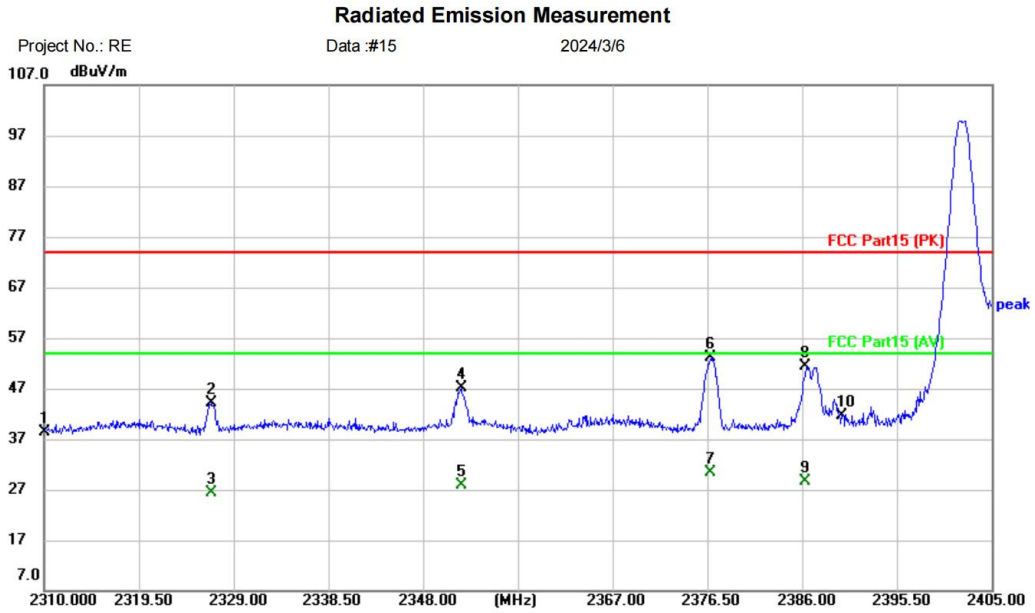
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	42.04	-2.89	39.15	74.00	-34.85	peak	
2		2326.910	52.41	-2.85	49.56	74.00	-24.44	peak	
3		2326.910	30.29	-2.85	27.44	54.00	-26.56	AVG	
4		2351.705	54.82	-2.78	52.04	74.00	-21.96	peak	
5		2351.705	31.12	-2.78	28.34	54.00	-25.66	AVG	
6	*	2376.785	62.15	-2.72	59.43	74.00	-14.57	peak	
7		2376.785	38.42	-2.72	35.70	54.00	-18.30	AVG	
8		2385.335	60.74	-2.70	58.04	74.00	-15.96	peak	
9		2385.335	34.91	-2.70	32.21	54.00	-21.79	AVG	
10		2390.000	49.32	-2.70	46.62	74.00	-27.38	peak	

Test Result: Pass

[TestMode:TX low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2402
Note:

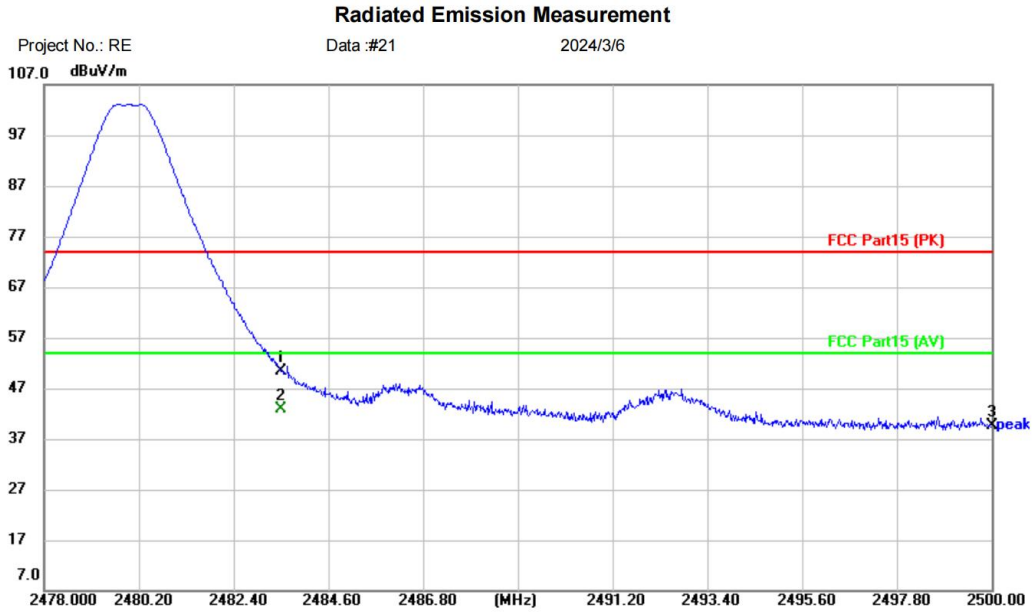
Polarization: ***Vertical***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	41.19	-2.89	38.30	74.00	-35.70	peak	
2		2326.815	46.87	-2.85	44.02	74.00	-29.98	peak	
3		2326.815	29.32	-2.85	26.47	54.00	-27.53	AVG	
4		2351.800	49.96	-2.78	47.18	74.00	-26.82	peak	
5		2351.800	30.67	-2.78	27.89	54.00	-26.11	AVG	
6	*	2376.880	55.85	-2.72	53.13	74.00	-20.87	peak	
7		2376.880	33.02	-2.72	30.30	54.00	-23.70	AVG	
8		2386.380	54.20	-2.70	51.50	74.00	-22.50	peak	
9		2386.380	31.29	-2.70	28.59	54.00	-25.41	AVG	
10		2390.000	44.38	-2.70	41.68	74.00	-32.32	peak	

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2480
Note:

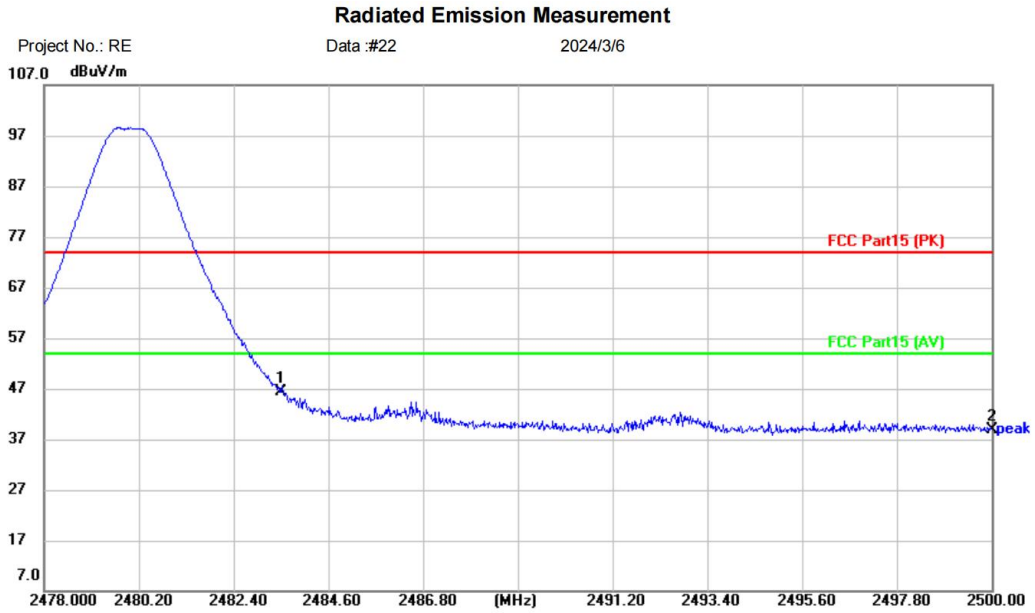
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	53.36	-2.91	50.45	74.00	-23.55	peak	
2	*	2483.500	45.89	-2.91	42.98	54.00	-11.02	AVG	
3		2500.000	42.54	-3.00	39.54	74.00	-34.46	peak	

Test Result: Pass

[TestMode:TX High channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: POC OBEX CONNECT
M/N: OBEX CONNECT
Mode: BLE TX-2480
Note:

Polarization: ***Vertical***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	49.22	-2.91	46.31	74.00	-27.69	peak	
2		2500.000	41.79	-3.00	38.79	74.00	-35.21	peak	

Test Result: Pass

17 CONDUCTED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Nikki
Temperature	23℃
Humidity	50%

17.1 LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated 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) (see §15.205(c)).