

TEST REPORT

Applicant: Shenzhen LOKMAT Technology Co., Ltd.

Address of Applicant: 9B, Block A, Building B5-1, Junfeng Industrial Park, Baoan District, Shenzhen, Guangdong

Manufacturer: Shenzhen LOKMAT Technology Co., Ltd.

Address of Manufacturer: 9B, Block A, Building B5-1, Junfeng Industrial Park, Baoan District, Shenzhen, Guangdong

Equipment Under Test (EUT)

Product Name: Smart Watch

Model No.: See model list

Trade Mark: LOKMAT

FCC ID: 2BC9M-ATTACKPRO

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
ANSI C63.10:2013

Date of sample receipt: October 11, 2023

Date of Test: October 12~16, 2023

Date of report issued: October 19, 2023

Test Result: PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

A red circular stamp with a star in the center. The text around the star reads "Global United Technology Services Co., Ltd." and "检验检测专用章" (Inspection and Testing Services Special Seal). The text "Robinson Luo" is written below the stamp.

Robinson Luo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Model List:

APLLP, APLLP 2, APLLP 3, APLLP 4, APLLP 5, APLLP 6, APLLP 7, APLLP 8, APLLP 9,
APLLP PRO, APLLP 2 PRO, APLLP 3 PRO, APLLP 4 PRO, APLLP 5 PRO, APLLP 6 PRO, APLLP 7 PRO, APLLP 8 PRO, APLLP 9 PRO,
APLLP MAX, APLLP 2 MAX, APLLP 3 MAX, APLLP 4 MAX, APLLP 5 MAX, APLLP 6 MAX, APLLP 7 MAX, APLLP 8 MAX, APLLP 9 MAX,
APLLP GT, APLLP 2 GT, APLLP 3 GT, APLLP 4 GT, APLLP 5 GT, APLLP 6 GT, APLLP 7 GT, APLLP 8 GT, APLLP 9 GT,
APLLP PLUS, APLLP 2 PLUS, APLLP 3 PLUS, APLLP 4 PLUS, APLLP 5 PLUS, APLLP 6 PLUS, APLLP 7 PLUS, APLLP 8 PLUS, APLLP 9 PLUS,
SKY, SKY 2, SKY 3, SKY 4, SKY 5, SKY 6, SKY 7, SKY 8, SKY 9, SKY PRO, SKY 2 PRO, SKY 3 PRO, SKY 4 PRO, SKY 5 PRO, SKY 6 PRO, SKY 7 PRO, SKY 8 PRO, SKY 9 PRO,
SKY MAX, SKY 2 MAX, SKY 3 MAX, SKY 4 MAX, SKY 5 MAX, SKY 6 MAX, SKY 7 MAX, SKY 8 MAX, SKY 9 MAX,
SKY GT, SKY 2 GT, SKY 3 GT, SKY 4 GT, SKY 5 GT, SKY 6 GT, SKY 7 GT, SKY 8 GT, SKY 9 GT,
SKY PLUS, SKY 2 PLUS, SKY 3 PLUS, SKY 4 PLUS, SKY 5 PLUS, SKY 6 PLUS, SKY 7 PLUS, SKY 8 PLUS, SKY 9 PLUS,
ATTACK, ATTACK 2, ATTACK 3, ATTACK 4, ATTACK 5, ATTACK PRO, ATTACK 2 PRO, ATTACK 3 PRO, ATTACK 4 PRO, ATTACK 5 PRO, ATTACK 6 PRO, ATTACK 7 PRO, ATTACK 8 PRO, ATTACK 9 PRO, ATTACK MAX, ATTACK 2 MAX, ATTACK 3 MAX, ATTACK 4 MAX, ATTACK 5 MAX, ATTACK 6 MAX, ATTACK 7 MAX, ATTACK 8 MAX, ATTACK 9 MAX,
ATTACK GT, ATTACK 2 GT, ATTACK 3 GT, ATTACK 4 GT, ATTACK 5 GT, ATTACK 6 GT, ATTACK 7 GT, ATTACK 8 GT, ATTACK 9 GT,
ATTACK PLUS, ATTACK 2 PLUS, ATTACK 3 PLUS, ATTACK 4 PLUS, ATTACK 5 PLUS, ATTACK 6 PLUS, ATTACK 7 PLUS, ATTACK 8 PLUS, ATTACK 9 PLUS,
COMET, COMET 2, COMET PRO, COMET 2 PRO, COMET 3 PRO, COMET 4 PRO, COMET 5 PRO, COMET 6 PRO, COMET 7 PRO, COMET 8 PRO, COMET 9 PRO,

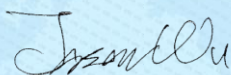
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COMET 9 MAX,
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COMET 6 GT, COMET 7 GT, COMET 8 GT, COMET 9 GT,
COMET PLUS, COMET 2 PLUS, COMET 3 PLUS, COMET 4 PLUS,
COMET 5 PLUS, COMET 6 PLUS, COMET 7 PLUS, COMET 8 PLUS,
COMET 9 PLUS,
OCEAN, OCEAN 2,
OCEAN 2 PRO, OCEAN 3 PRO, OCEAN 4 PRO, OCEAN 5 PRO,
OCEAN 6 PRO, OCEAN 7 PRO, OCEAN 8 PRO, OCEAN 9 PRO,
OCEAN MAX, OCEAN 2 MAX, OCEAN 3 MAX, OCEAN 4 MAX,
OCEAN 5 MAX, OCEAN 6 MAX, OCEAN 7 MAX, OCEAN 8 MAX,
OCEAN 9 MAX,
OCEAN GT, OCEAN 2 GT, OCEAN 3 GT, OCEAN 4 GT, OCEAN 5 GT,
OCEAN 6 GT, OCEAN 7 GT, OCEAN 8 GT, OCEAN 9 GT,
OCEAN PLUS, OCEAN 2 PLUS, OCEAN 3 PLUS, OCEAN 4 PLUS,
OCEAN 5 PLUS, OCEAN 6 PLUS, OCEAN 7 PLUS, OCEAN 8 PLUS,
OCEAN 9 PLUS,
QUEEN, QUEEN 2,
QUEEN PRO, QUEEN 2 PRO, QUEEN 3 PRO, QUEEN 4 PRO,
QUEEN 5 PRO, QUEEN 6 PRO, QUEEN 7 PRO, QUEEN 8 PRO,
QUEEN 9 PRO,
QUEEN MAX, QUEEN 2 MAX, QUEEN 3 MAX, QUEEN 4 MAX,
QUEEN 5 MAX, QUEEN 6 MAX, QUEEN 7 MAX, QUEEN 8 MAX,
QUEEN 9 MAX,
QUEEN GT, QUEEN 2 GT, QUEEN 3 GT, QUEEN 4 GT, QUEEN 5 GT,
QUEEN 6 GT, QUEEN 7 GT, QUEEN 8 GT, QUEEN 9 GT,
SEA, SEA 2,
SEA PRO, SEA 2 PRO, SEA 3 PRO, SEA 4 PRO, SEA 5 PRO, SEA 6 PRO,
SEA 7 PRO, SEA 8 PRO, SEA 9 PRO,
SEA MAX, SEA 2 MAX, SEA 3 MAX, SEA 4 MAX, SEA 5 MAX, SEA 6 MAX,
SEA 7 MAX, SEA 8 MAX, SEA 9 MAX,
SEA GT, SEA 2 GT, SEA 3 GT, SEA 4 GT, SEA 5 GT, SEA 6 GT, SEA 7 GT,
SEA 8 GT, SEA 9 GT,
TIME, TIME 2,
TIME PRO, TIME 2 PRO, TIME 3 PRO, TIME 4 PRO, TIME 5 PRO,
TIME 6 PRO, TIME 7 PRO, TIME 8 PRO, TIME 9 PRO,
TIME MAX, TIME 2 MAX, TIME 3 MAX, TIME 4 MAX, TIME 5 MAX,
TIME 6 MAX, TIME 7 MAX, TIME 8 MAX, TIME 9 MAX,

TIME GT, TIME 2 GT, TIME 3 GT, TIME 4 GT, TIME 5 GT, TIME 6 GT,
TIME 7 GT, TIME 8 GT, TIME 9 GT,
ZEUS, ZEUS 2, ZEUS 3, ZEUS 4, ZEUS 5, ZEUS 6, ZEUS 7, ZEUS 8,
ZEUS 9,
ZEUS PRO, ZEUS 2 PRO, ZEUS 3 PRO, ZEUS 4 PRO, ZEUS 5 PRO,
ZEUS 6 PRO, ZEUS 7 PRO, ZEUS 8 PRO, ZEUS 9 PRO,
ZEUS MAX, ZEUS 2 MAX, ZEUS 3 MAX, ZEUS 4 MAX, ZEUS 5 MAX,
ZEUS 6 MAX, ZEUS 7 MAX, ZEUS 8 MAX, ZEUS 9 MAX,
ZEUS GT, ZEUS 2 GT, ZEUS 3 GT, ZEUS 4 GT, ZEUS 5 GT, ZEUS 6 GT,
ZEUS 7 GT, ZEUS 8 GT, ZEUS 9 GT.

2 Version

Version No.	Date	Description
00	October 19, 2023	Original

Prepared By:



Date:

October 19, 2023

Project Engineer

Check By:



Date:

October 19, 2023

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (b)(4)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Channel Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	1×10^{-7}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	3dB
6	Conducted Spurious emissions	2.58dB
7	AC Power Line Conducted Emission	3.44dB (0.15MHz ~ 30MHz)
8	Radiated Spurious emission test	3.1dB (9kHz-30MHz)
		3.8039dB (30MHz-200MHz)
		3.9679dB (200MHz-1GHz)
		4.29dB (1GHz-18GHz)
		3.30dB (18GHz-40GHz)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Smart Watch
Model No.:	See model list
Test Model No.:	ATTACK PRO
Test sample(s) ID:	GTSL2023100079-1
Sample(s) Status:	Engineer sample
Serial No.:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Channel Numbers:	40
Channel Separation:	2MHz
Modulation Type:	GFSK
Antenna Type:	Internal antenna
Antenna Gain:	0.17dBi
Power Supply:	DC 5V (Powered by adapter) DC 3.7V(Powered by battery)

Remark:

1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

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	2440MHz
The Highest channel	2480MHz

Test Item	Software	Description
Conducted RF Testing and Radiated testing	RTLBTAPP	Set the EUT to different modulation and channel

Output power setting table:

Test Mode	Set Tx Output Power	Data Rate
BLE	0x44	1Mbps

Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

5.2 Description of Support Units

Adapter: Input: AC 100-240V~, 50/60Hz Output: 5V  , 1A
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5.3 Deviation from Standards

None.

5.4 Abnormalities from Standard Conditions

None.

5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: • FCC—Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory 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. • ISED—Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing • NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.6 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 14, 2023	April 13, 2024
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 30, 2022	Oct. 29, 2023
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 30, 2022	Oct. 29, 2023
13	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024
14	Amplifier	/	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS668	Dec. 20, 2022	Dec.19, 2023
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	April 14, 2023	April 13, 2024
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 19, 2023	April 18, 2024
18	RE cable 1	GTS	N/A	GTS675	July 31. 2023	July 30. 2024
19	RE cable 2	GTS	N/A	GTS676	July 31. 2023	July 30. 2024
20	RE cable 3	GTS	N/A	GTS677	July 31. 2023	July 30. 2024
21	RE cable 4	GTS	N/A	GTS678	July 31. 2023	July 30. 2024
22	RE cable 5	GTS	N/A	GTS679	July 31. 2023	July 30. 2024
23	RE cable 6	GTS	N/A	GTS680	July 31. 2023	July 30. 2024
24	RE cable 7	GTS	N/A	GTS681	July 31. 2023	July 30. 2024
25	RE cable 8	GTS	N/A	GTS682	July 31. 2023	July 30. 2024

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	April 14, 2023	April 13, 2024
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 19, 2023	April 18, 2024
7	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 14, 2023	April 13, 2024
8	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 14, 2023	April 13, 2024
9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 14, 2023	April 13, 2024
10	Antenna end assembly	Weinschel	1870A	GTS560	April 14, 2023	April 13, 2024

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 19, 2023	April 18, 2024

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	April 19, 2023	April 18, 2024

7 Test results and Measurement Data

7.1 Antenna requirement

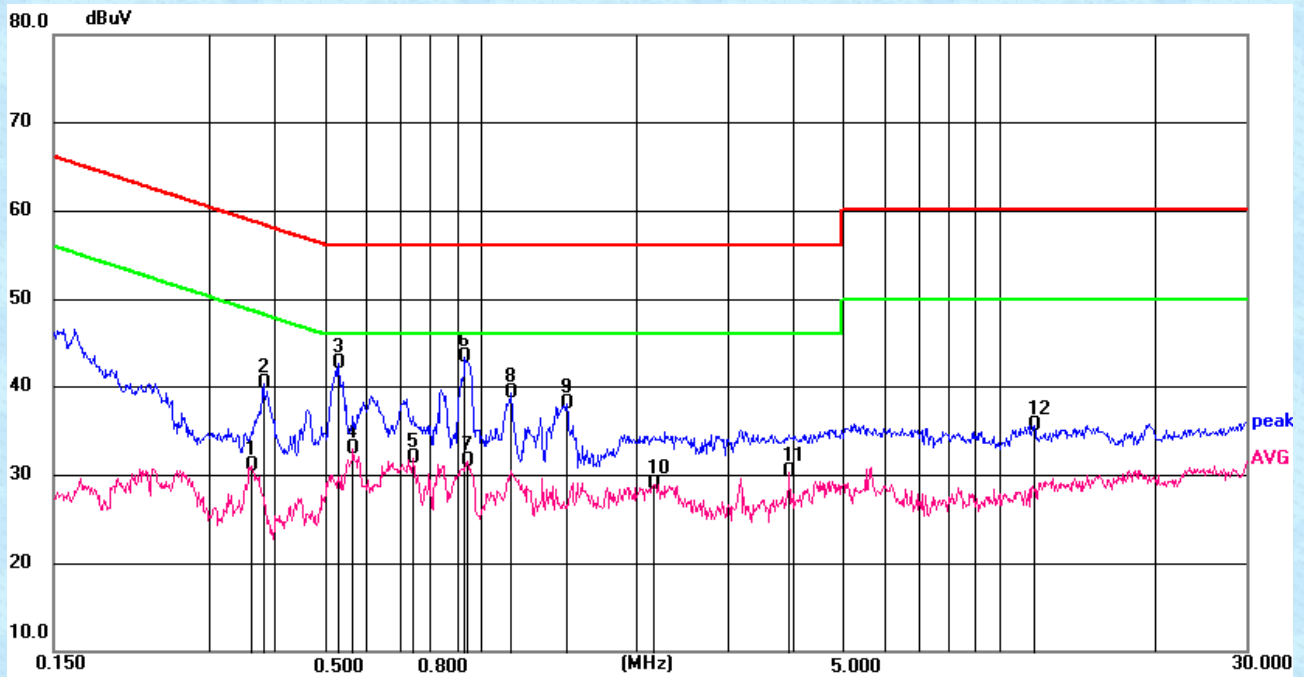
Standard requirement:	FCC Part15 C Section 15.203 /247(b)(4)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
15.247(b)(4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
<i>The antenna is Internal antenna, the best case gain of the is 0.17dBi, reference to the appendix II for details</i>	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207																			
Test Method:	ANSI C63.10:2013																			
Test Frequency Range:	150kHz to 30MHz																			
Class / Severity:	Class B																			
Receiver setup:	RBW=9kHz, VBW=30kHz, Sweep time=auto																			
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * Decreases with the logarithm of the frequency.						Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																			
	Quasi-peak	Average																		
0.15-0.5	66 to 56*	56 to 46*																		
0.5-5	56	46																		
5-30	60	50																		
Test setup:	Reference Plane Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.1m																			
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2009 on conducted measurement.																			
Test Instruments:	Refer to section 6.0 for details																			
Test mode:	Refer to section 5.2 for details																			
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar														
Test voltage:	AC 120V, 60Hz																			
Test results:	Pass																			

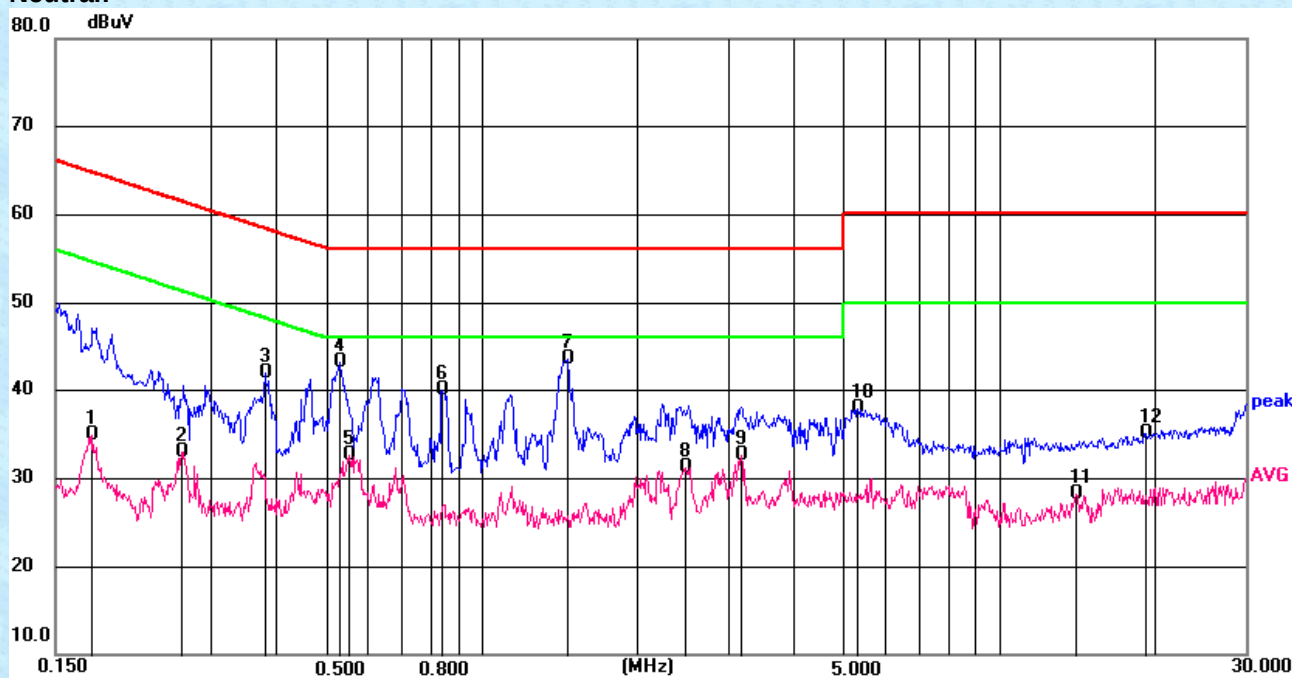
Pre-scan all test modes, found worst case at GFSK 1M 2402MHz, and so only show the test result of GFSK 1M 2402MHz

Line:



Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.3613	21.04	10.01	31.05	48.7	17.65	AVG
0.381	30.42	10.01	40.43	58.26	17.83	QP
0.5321	32.63	10.02	42.65	56	13.35	QP
0.5664	22.95	10.02	32.97	46	13.03	AVG
0.7429	21.87	10.02	31.89	46	14.11	AVG
0.9331	33.41	10.03	43.44	56	12.56	QP
0.9425	21.61	10.03	31.64	46	14.36	AVG
1.1471	29.41	10.03	39.44	56	16.56	QP
1.4637	28.07	10.04	38.11	56	17.89	QP
2.1551	18.91	10.06	28.97	46	17.03	AVG
3.9428	20.3	10.12	30.42	46	15.58	AVG
11.6821	25.29	10.33	35.62	60	24.38	QP

Neutral:

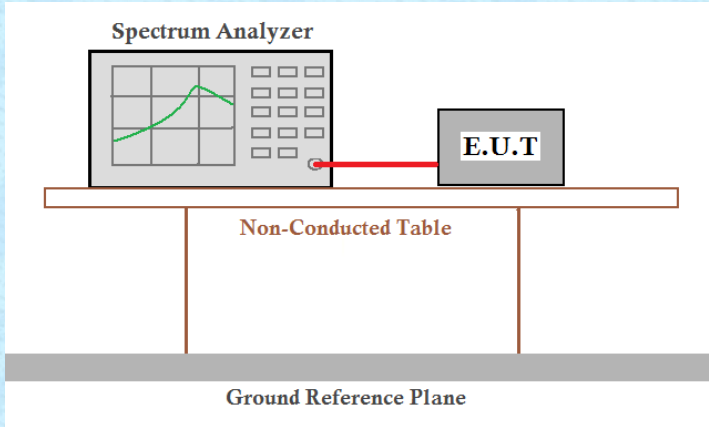


Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1766	24.87	10.01	34.88	54.64	19.76	AVG
0.263	23.08	10.01	33.09	51.34	18.25	AVG
0.381	31.92	10.01	41.93	58.26	16.33	QP
0.5321	33.13	10.02	43.15	56	12.85	QP
0.5551	22.7	10.02	32.72	46	13.28	AVG
0.8393	30.11	10.02	40.13	56	15.87	QP
1.4637	33.57	10.04	43.61	56	12.39	QP
2.4735	21.23	10.07	31.3	46	14.7	AVG
3.173	22.54	10.09	32.63	46	13.37	AVG
5.333	27.82	10.16	37.98	60	22.02	QP
14.0625	17.85	10.37	28.22	50	21.78	AVG
19.2236	24.64	10.46	35.1	60	24.9	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
 3. Final Level = Receiver Read level + LISN Factor + Cable Loss
- If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Conducted Peak Output Power

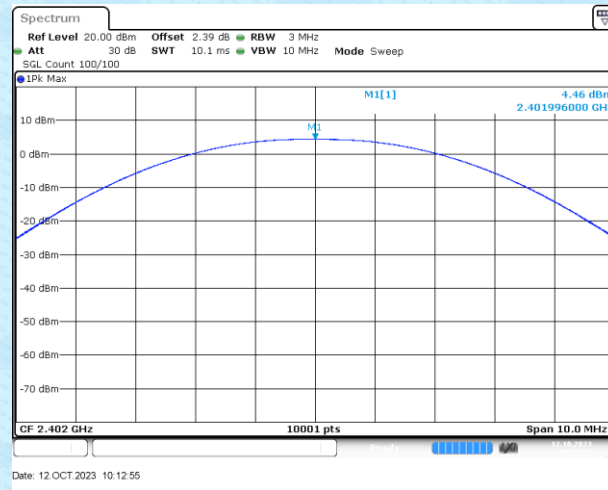
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	30dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

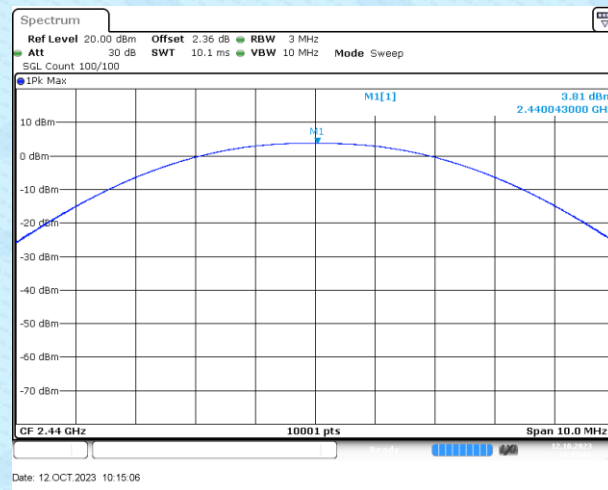
Modulation mode	Test channel	Peak Output Power (dBm)	Output Power Limit(dBm)	Result
GFSK (1M)	Lowest	4.46	30.00	Pass
	Middle	3.81	30.00	Pass
	Highest	3.46	30.00	Pass

Test plot as follows:

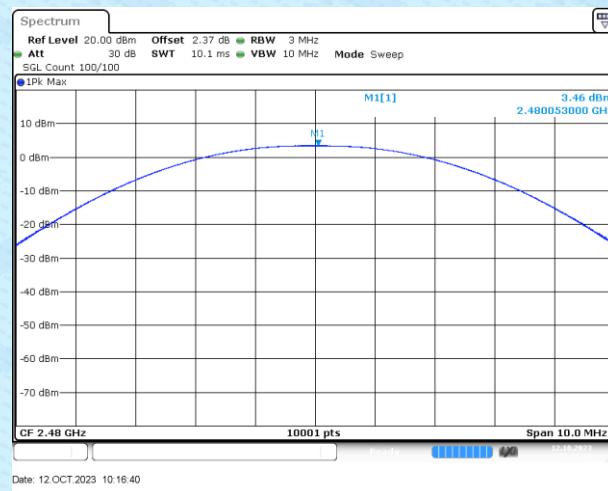
GFSK (1M)



Lowest channel

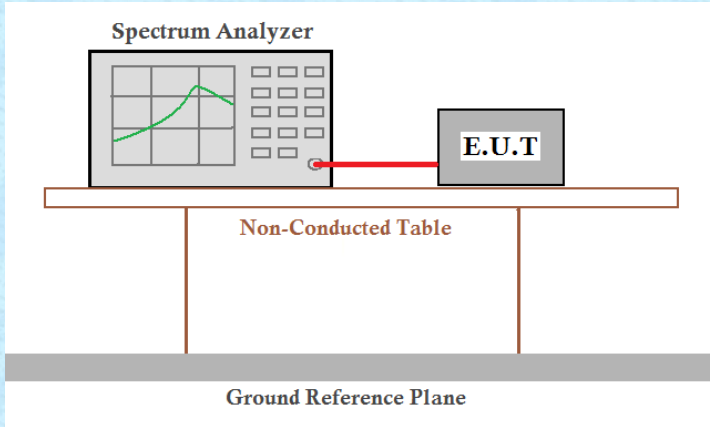


Middle channel



Highest channel

7.4 Channel Bandwidth & 99% Occupancy Bandwidth

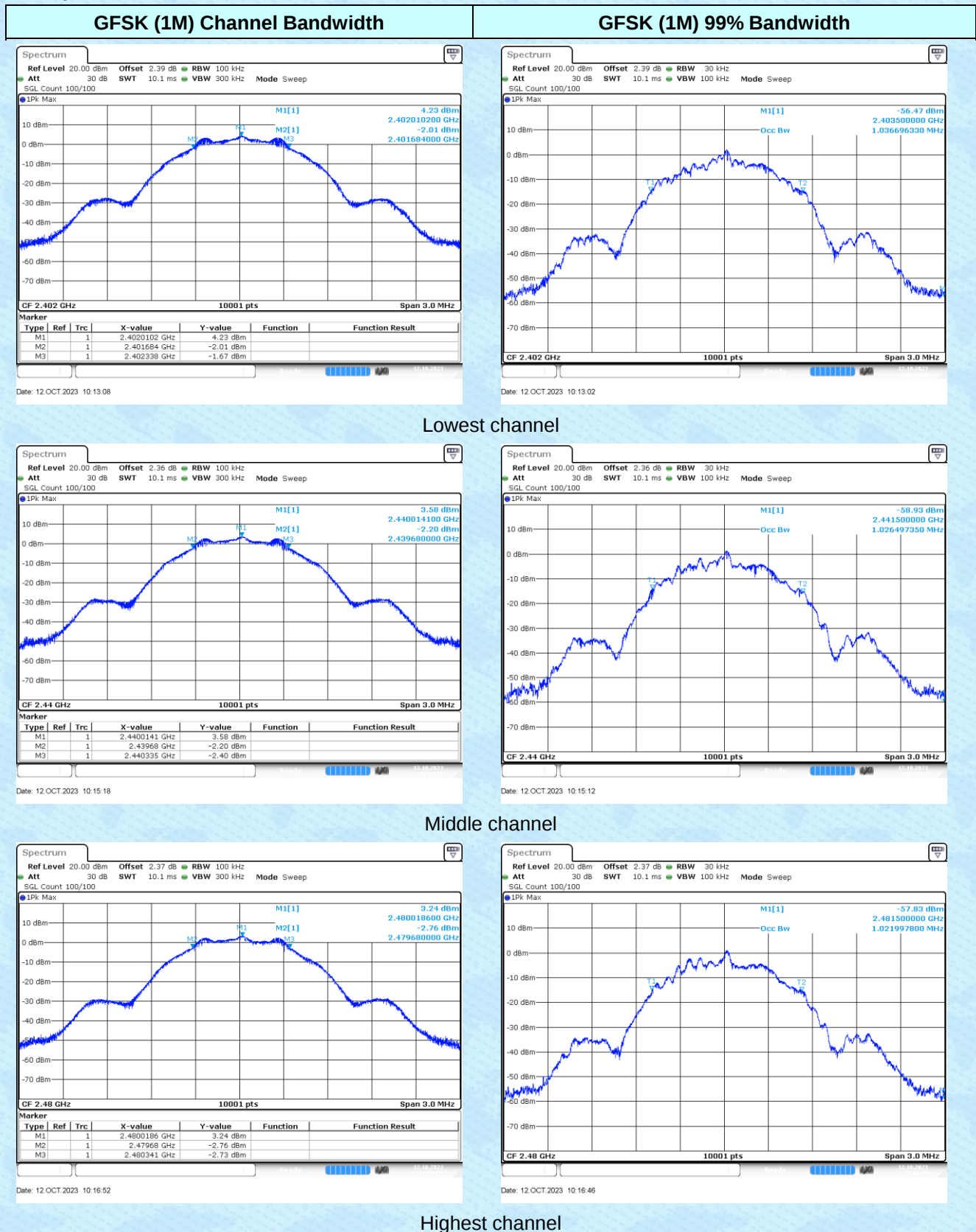
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	>500KHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

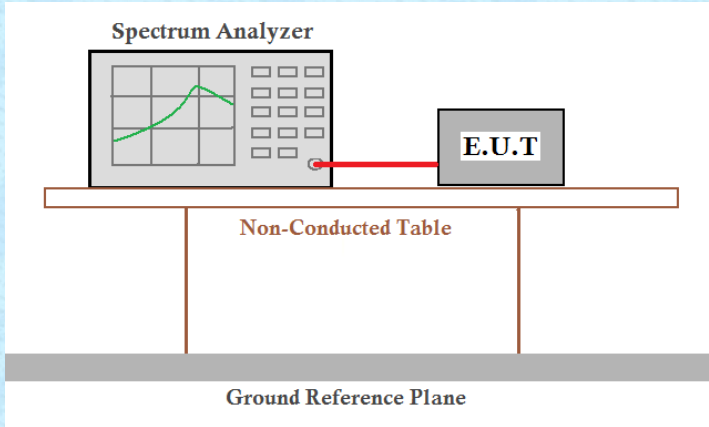
Modulation mode	Test channel	Channel Bandwidth (MHz)	Limit(KHz)	Result
GFSK (1M)	Lowest	0.654	>500	Pass
	Middle	0.656		
	Highest	0.661		

Modulation mode	Test channel	99% Bandwidth (MHz)	Result
GFSK (1M)	Lowest	1.037	Pass
	Middle	1.026	
	Highest	1.022	

Test plot as follows:



7.5 Power Spectral Density

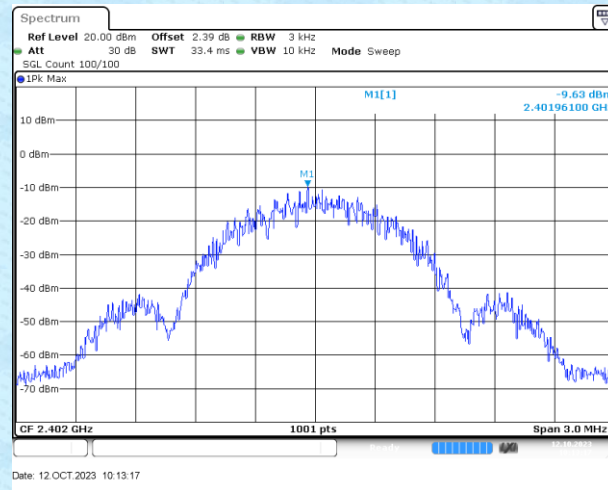
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

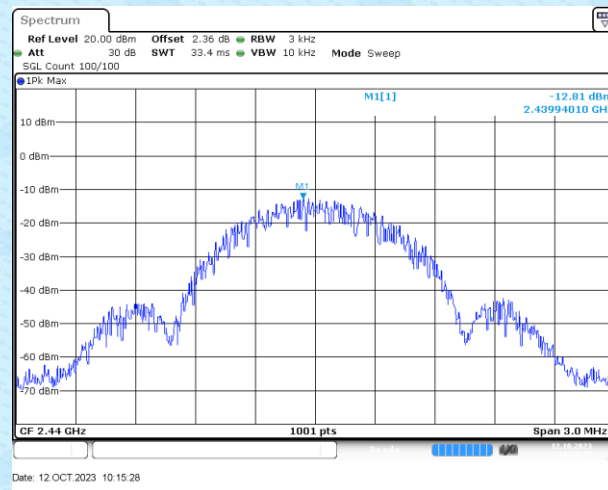
Modulation mode	Test channel	Power Spectral Density (dBm/3kHz)	Limit(dBm/3kHz)	Result
GFSK(1M)	Lowest	-9.63	8.00	Pass
	Middle	-12.81		
	Highest	-12.41		

Test plot as follows:

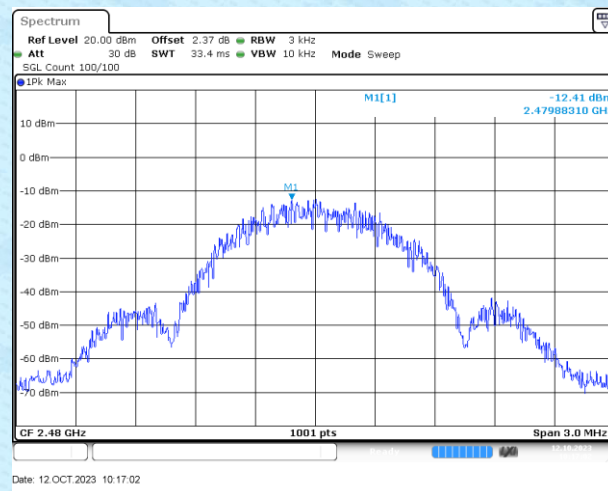
GFSK (1M)



Lowest channel



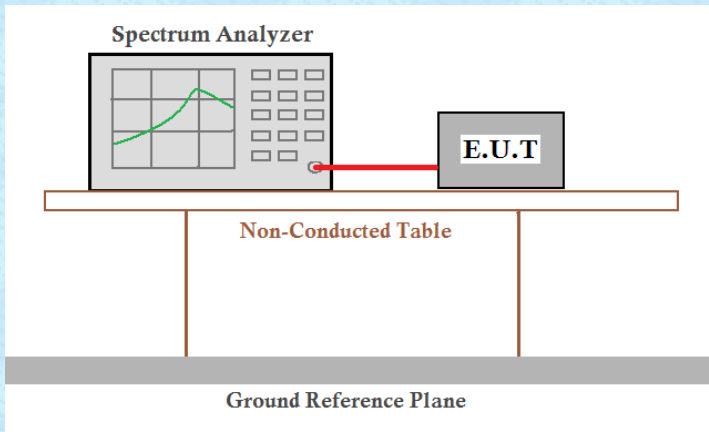
Middle channel



Highest channel

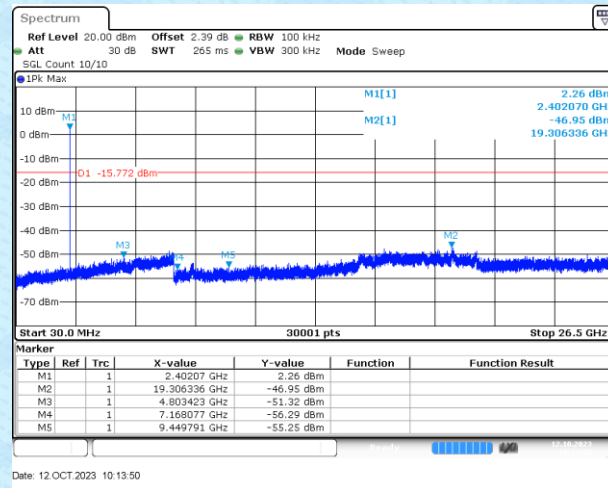
7.6 Spurious Emission in Non-restricted & restricted Bands

7.6.1 Conducted Emission Method

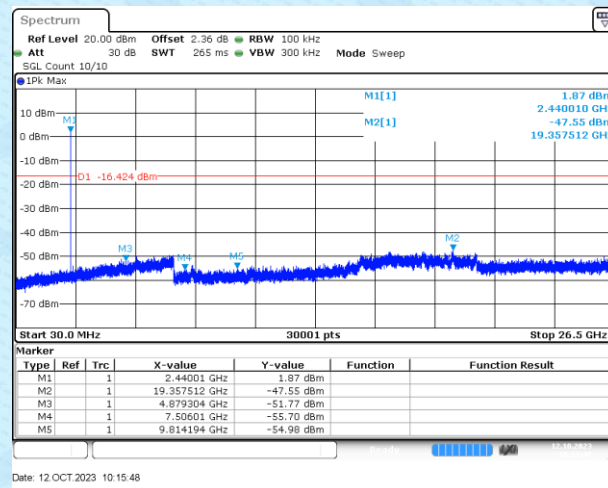
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional 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.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

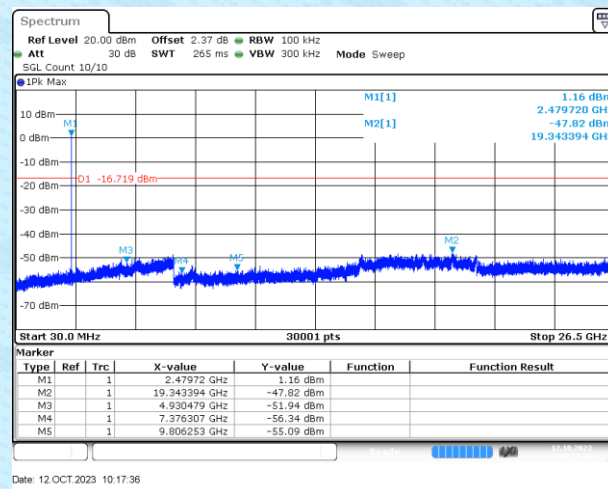
GFSK (1M)



Lowest channel

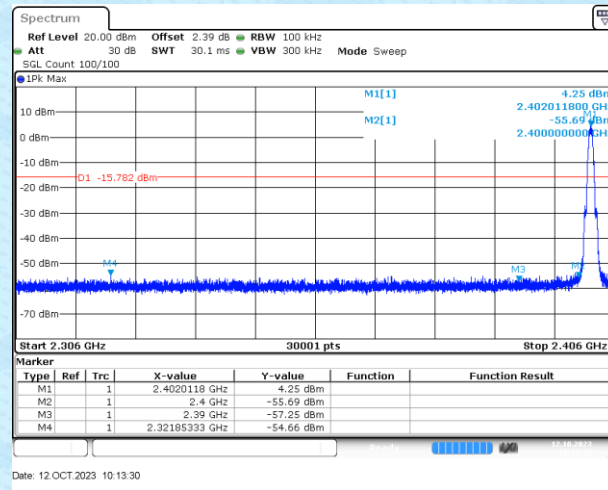


Middle channel

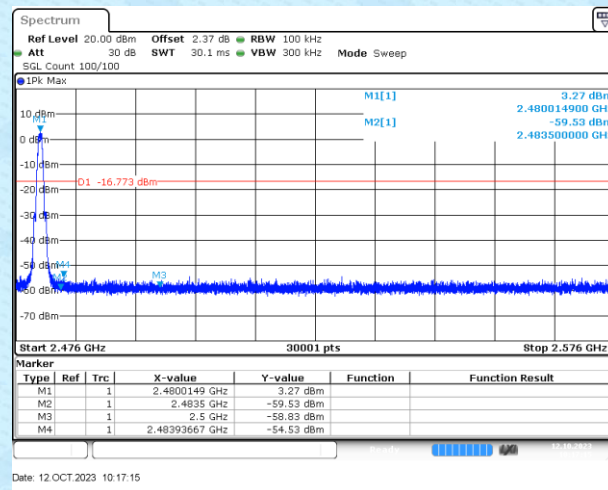


Highest channel

GFSK (1M)

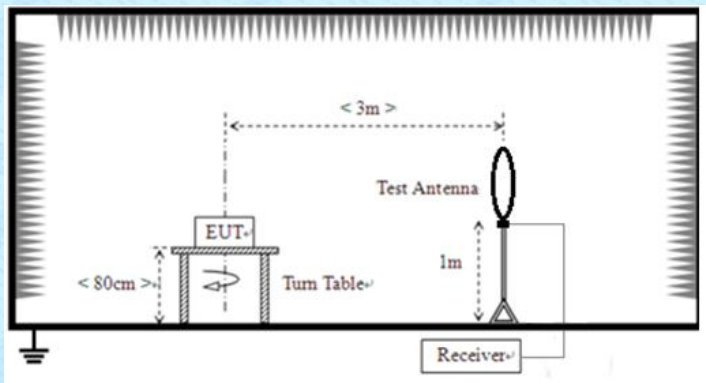


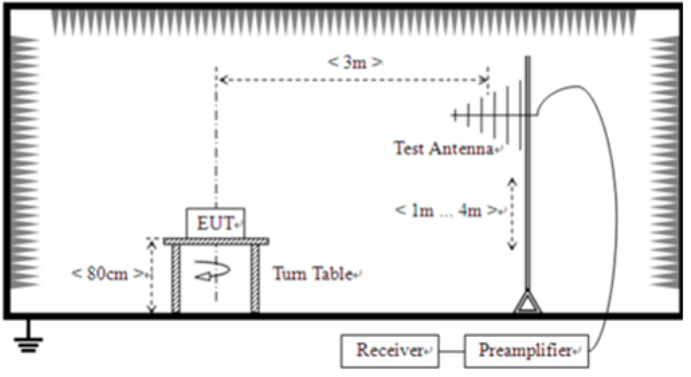
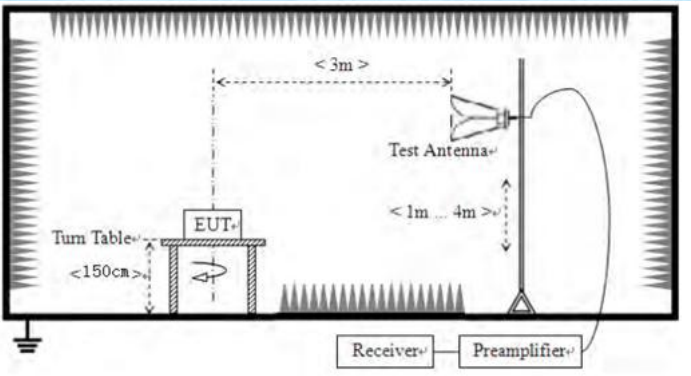
Lowest channel



Highest channel

7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013 & RSS-Gen				
Test Frequency Range:	9kHz to 26.5GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	30m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					

	For radiated emissions from 30MHz to 1GHz  For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.1m) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details

Test environment:	Temp.:	26 °C	Humid.:	54%	Press.:	1012mbar
Test voltage:	DC 3.7V					
Test results:	Pass					

Measurement data:

Remark:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

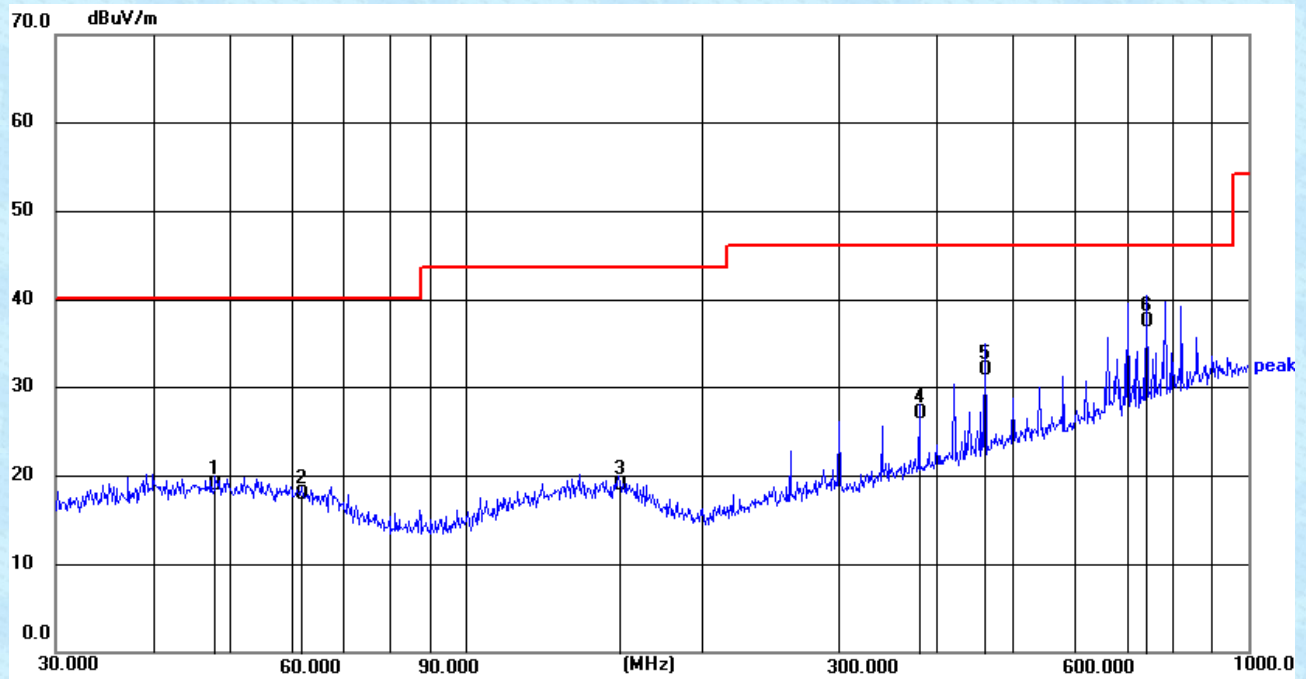
■ 9kHz~30MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ Below 1GHz

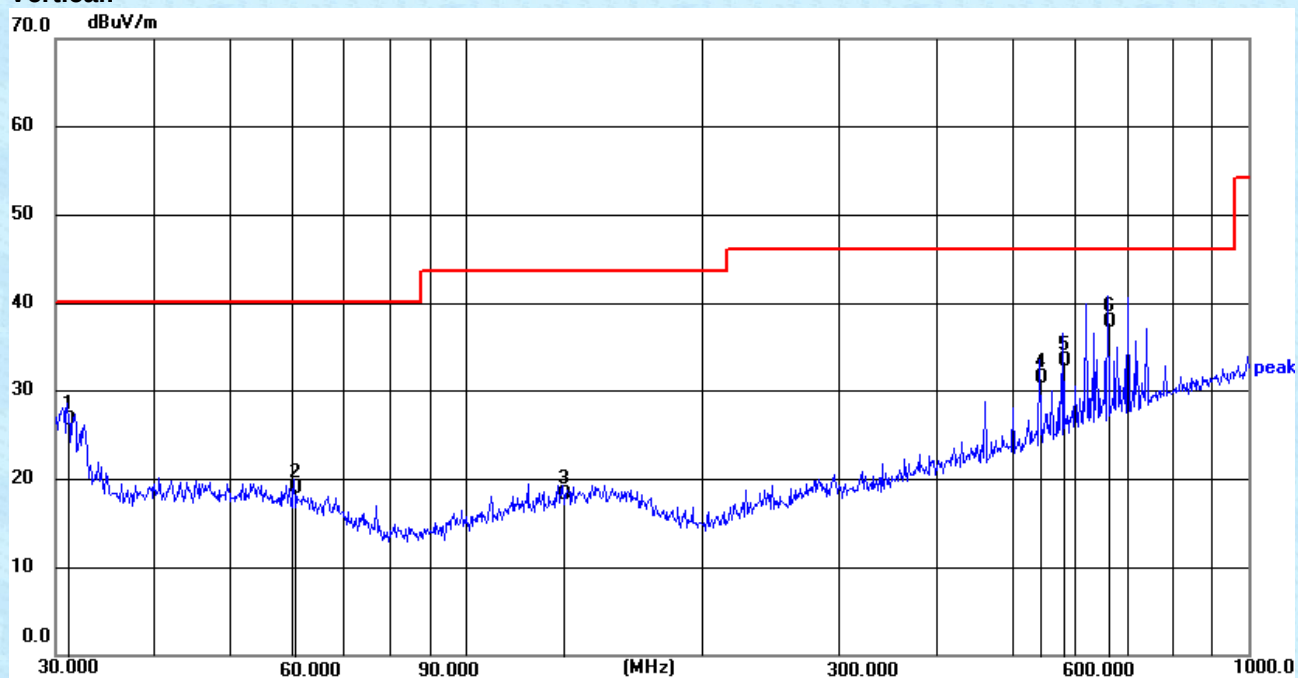
Pre-scan all test modes, found worst case at GFSK(1M) 2402MHz, and so only show the test result of GFSK(1M) 2402MHz

Horizontal:



Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
47.9940	4.28	14.67	18.95	40.00	21.05	QP
61.7781	4.21	13.62	17.83	40.00	22.17	QP
157.0074	4.33	14.68	19.01	43.50	24.49	QP
379.9141	9.92	17.16	27.08	46.00	18.92	QP
460.7271	12.75	19.17	31.92	46.00	14.08	QP
742.2587	13.85	23.61	37.46	46.00	8.54	QP

Vertical:



Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
31.0706	14.04	12.65	26.69	40.00	13.31	QP
60.4918	5.50	13.51	19.01	40.00	20.99	QP
133.1511	4.40	13.90	18.30	43.50	25.20	QP
541.3725	11.23	20.28	31.51	46.00	14.49	QP
580.7026	12.52	20.98	33.50	46.00	12.50	QP
661.1505	15.54	22.22	37.76	46.00	8.24	QP

Remark:

1. An initial pre-scan was performed on the Horizontal and Vertical with peak detector.
2. Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3. Level = Reading + Factor
4. Factor = Antenna Gain + Cable Loss – Amplifier Gain

■ Unwanted Emissions in non-restricted Frequency Bands

Above 1GHz

Test mode:	BLE 1M	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804	38.55	31.62	8.58	32.11	46.64	74	-27.36	Vertical
4804	36.83	31.62	8.58	32.11	44.92	74	-29.08	Horizontal

Test mode:	BLE 1M	Test channel:	Middle
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880	37.54	31.92	8.71	32.11	46.06	74	-27.94	Vertical
4880	35.63	31.92	8.71	32.11	44.15	74	-29.85	Horizontal

Test mode:	BLE 1M	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960	36.34	31.96	8.75	32.3	44.75	74	-29.25	Vertical
4960	37.27	31.96	8.75	32.3	45.68	74	-28.32	Horizontal

Test mode:	BLE 1M	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2310	48.26	27.14	6.19	42.04	39.55	74	-34.45	Horizontal
2390	48.91	27.37	6.31	42.11	40.48	74	-33.52	Horizontal
2310	48.09	27.14	6.19	42.04	39.38	74	-34.62	Vertical
2390	47.57	27.37	6.31	42.11	39.14	74	-34.86	Vertical

Test mode:	BLE 1M	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	51.16	27.66	6.45	42.01	43.26	74	-30.74	Horizontal
2500	46.87	27.7	6.47	42	39.04	74	-34.96	Horizontal
2483.5	49.71	27.66	6.45	42.01	41.81	74	-32.19	Vertical
2500	47.07	27.7	6.47	42	39.24	74	-34.76	Vertical

Remark.

1. $Level = Reading\ Level + Antenna\ factor + Cable\ Loss - Amplifier\ factor$
2. other emissions are attenuated 20dB below the limits, so it does not reported.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----