

TEST REPORT

Applicant: Shenzhen Vijim Technology Co.,Ltd

Address of Applicant: A1705, Building A, Galaxy World, No.1 Yabao Road, Bantian Street, Longgang District, Shenzhen, China

Manufacturer: Shenzhen Xuanyue Cheng Technology Co., Ltd

Address of Manufacturer: 5th Floor, Building 1, Zhu'ao Industrial Zone, Xixiang Street, Bao'an District, Shenzhen, China

Equipment Under Test (EUT)

Product Name: wireless microphone

Model No.: WM-10, J10, J11, J12, J13, J14, J15, J16, J18, J20, J22, J30, J50, J60, J80, A1, A2, A3, A5, A6, A8, A9, A10, A20, A30, A50, A60, A80, F1, F2, F3, F5, F6, F8, F9, F10, F11, F12, F20, F30, F50, F60, F80, WM-11, WM-12, WM-13, WM-15, WM-16, WM-18, WM-19, WM-20

Trade Mark: ulanzi

FCC ID: 2A722-WM10

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249

Date of sample receipt: August 23, 2023

Date of Test: August 24-30, 2023

Date of report issued: August 30 2023

Test Result : PASS *

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

Authorized Signature:



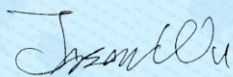
Laboratory Manager

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.

2 Version

Version No.	Date	Description
00	August 30 2023	Original

Prepared By:

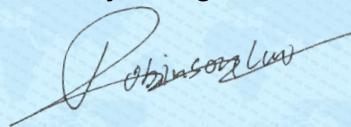


Date:

August 30 2023

Project Engineer

Check By:



Date:

August 30 2023

Reviewer

3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	7
5.3 DESCRIPTION OF SUPPORT UNITS	7
5.4 DEVIATION FROM STANDARDS	7
5.5 ABNORMALITIES FROM STANDARD CONDITIONS	7
5.6 TEST FACILITY	8
5.7 TEST LOCATION	8
5.8 ADDITIONAL INSTRUCTIONS.....	8
6 TEST INSTRUMENTS LIST	9
7 TEST RESULTS AND MEASUREMENT DATA.....	11
7.1 ANTENNA REQUIREMENT	11
7.2 CONDUCTED EMISSIONS	12
7.3 RADIATED EMISSION METHOD	15
7.3.1 Field Strength of The Fundamental Signal	17
7.3.2 Spurious emissions.....	18
7.3.3 Bandedge emissions.....	23
7.4 20dB OCCUPY BANDWIDTH	24
8 TEST SETUP PHOTO	26
9 EUT CONSTRUCTIONAL DETAILS	26

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark: Test according to ANSI C63.10:2013.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz-30MHz	3.1dB	(1)
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

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:	wireless microphone
Model No.:	WM-10, J10, J11, J12, J13, J14, J15, J16, J18, J20, J22, J30, J50, J60, J80, A1, A2, A3, A5, A6, A8, A9, A10, A20, A30, A50, A60, A80, F1, F2, F3, F5, F6, F8, F9, F10, F11, F12, F20, F30, F50, F60, F80, WM-11, WM-12, WM-13, WM-15, WM-16, WM-18, WM-19, WM-20
Test Model No.:	WM-10
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.	
Serial No.:	00001-100000
Hardware Version:	V1.2
Software Version:	V1.5
Test sample(s) ID:	GTSL2023080274-1
Sample(s) Status	Engineered sample
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, $\pi/4$ -DQPSK
Antenna Type:	Chip Antenna
Antenna gain:	3.23dBi(Declared by applicant)
Power supply:	DC 3.7V, 70mAh, 0.259Wh for Li-ion 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	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

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	2441MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
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.	

Pre-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	84.12	85.34	83.44

Final Test Mode:

The EUT was tested in GFSK, $\pi/4$ -DQPSK modulation, and found the GFSK modulation is the worst case. According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup":
Y axis (see the test setup photo)

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
APPLE	USB Charger	A1399	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 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).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

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

5.8 Additional Instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default

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

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
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.	
EUT Antenna:	
The antenna is chip antenna, reference to the appendix II for details	

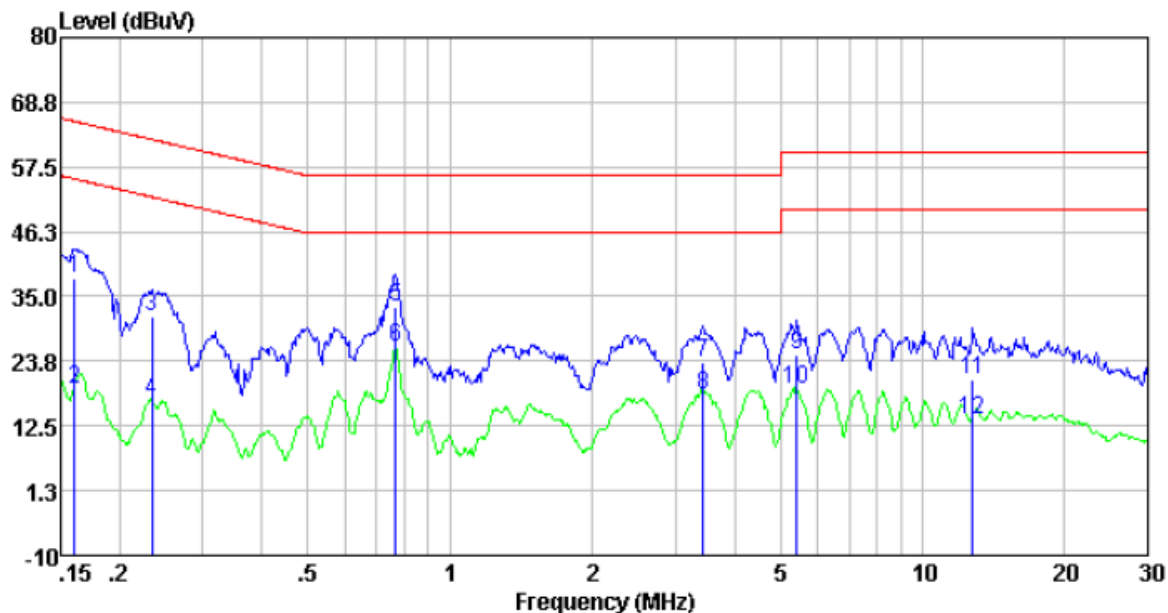
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	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	
* Decreases with the logarithm of the frequency.						
Test setup:	Reference Plane <i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>					
Test procedure:	1. The EUT 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: 2013 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:	AC120V 60Hz					
Test results:	Pass					

Measurement data

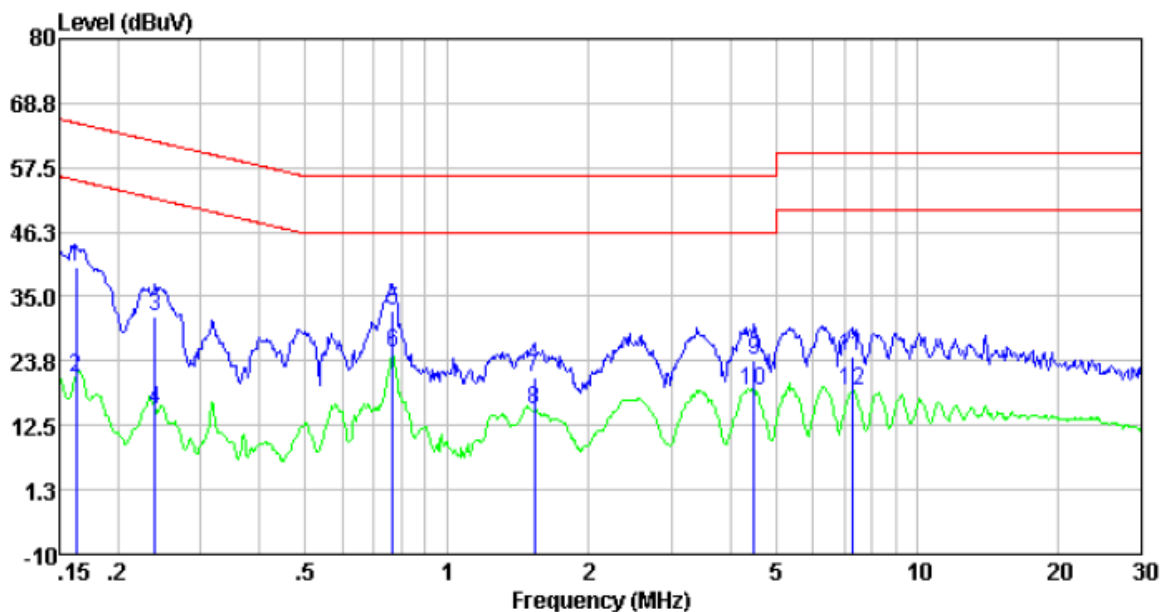
Pre-scan all test modes, found worst case at GFSK 2402MHz, and so only show the test result of it.

Line:



Freq	Reading	LISM/ISN	Cable	Level	Limit	Over	Remark
MHz	dBuV	factor	loss	dBuV	dBuV	dB	
0.16	28.71	9.55	0.01	38.27	65.43	-27.16	QP
0.16	9.22	9.55	0.01	18.78	55.43	-36.65	Average
0.23	21.94	9.51	0.01	31.46	62.30	-30.84	QP
0.23	7.39	9.51	0.01	16.91	52.30	-35.39	Average
0.77	23.53	9.50	0.02	33.05	56.00	-22.95	QP
0.77	16.60	9.50	0.02	26.12	46.00	-19.88	Average
3.44	14.02	9.52	0.06	23.60	56.00	-32.40	QP
3.44	8.31	9.52	0.06	17.89	46.00	-28.11	Average
5.42	15.48	9.45	0.07	25.00	60.00	-35.00	QP
5.42	9.52	9.45	0.07	19.04	50.00	-30.96	Average
12.78	11.02	9.47	0.14	20.63	60.00	-39.37	QP
12.78	4.12	9.47	0.14	13.73	50.00	-36.27	Average

Neutral:

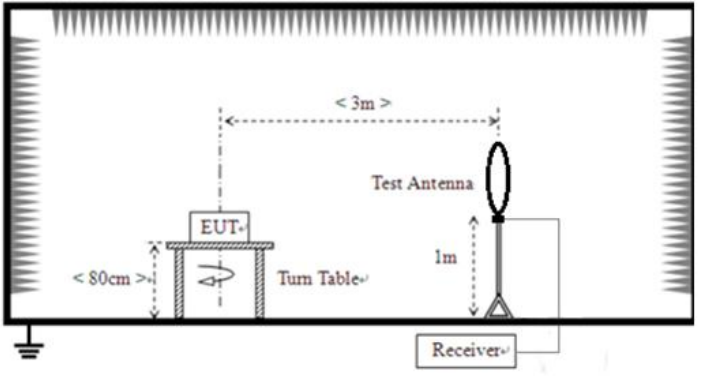


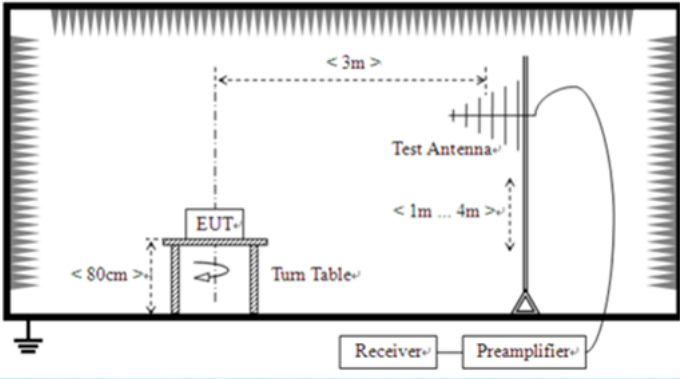
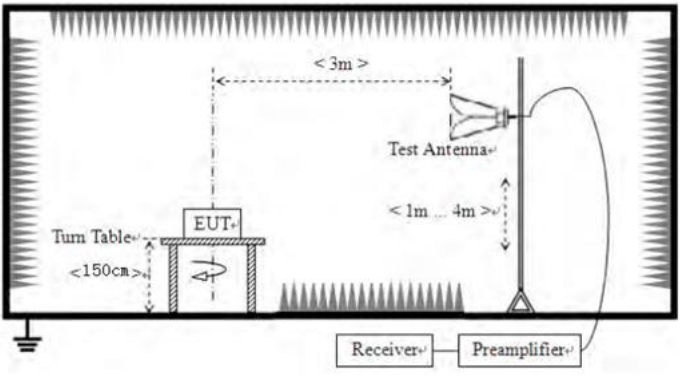
Freq	Reading	LISN/ISN	Cable	Level	Limit	Over	Remark
MHz	dBuV	dB	loss	dBuV	dBuV	dB	
0.16	30.58	9.55	0.01	40.14	65.34	-25.20	QP
0.16	11.33	9.55	0.01	20.89	55.34	-34.45	Average
0.24	22.07	9.56	0.01	31.64	62.13	-30.49	QP
0.24	5.78	9.56	0.01	15.35	52.13	-36.78	Average
0.77	22.81	9.56	0.02	32.39	56.00	-23.61	QP
0.77	15.59	9.56	0.02	25.17	46.00	-20.83	Average
1.54	11.39	9.55	0.04	20.98	56.00	-35.02	QP
1.54	5.63	9.55	0.04	15.22	46.00	-30.78	Average
4.50	14.26	9.56	0.06	23.88	56.00	-32.12	QP
4.50	9.04	9.56	0.06	18.66	46.00	-27.34	Average
7.25	14.87	9.53	0.09	24.49	60.00	-35.51	QP
7.25	9.00	9.53	0.09	18.62	50.00	-31.38	Average

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
4. 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 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	2400MHz-2483.5MHz		94.00		Average Value
			114.00		Peak Value
Limit: (Spurious Emissions)	Frequency		Limit (uV/m)		Remark
	0.009MHz-0.490MHz		2400/F(kHz) @300m		Quasi-peak Value
	0.490MHz-1.705MHz		24000/F(kHz) @30m		Quasi-peak Value
	1.705MHz-30.0MHz		30 @30m		Quasi-peak Value
	30MHz-88MHz		100 @3m		Quasi-peak Value
	88MHz-216MHz		150 @3m		Quasi-peak Value
	216MHz-960MHz		200 @3m		Quasi-peak Value
	960MHz-1GHz		500 @3m		Quasi-peak Value
	Above 1GHz		500 @3m		Average Value
			5000 @3m		Peak Value
Limit: (band edge)	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Test setup:	For radiated emissions from 9kHz to 30MHz  For radiated emissions from 30MHz to1GHz				

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) 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.: 25 °C Humid.: 52% Press.: 1012mbar
Test voltage:	DC 3.7V
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2402.00	93.47	27.43	2.93	38.88	84.95	114.00	-29.05	Vertical
2402.00	92.15	27.43	2.93	38.88	83.63	114.00	-30.37	Horizontal
2441.00	93.78	27.55	2.96	38.98	85.31	114.00	-28.69	Vertical
2441.00	91.76	27.55	2.96	38.98	83.29	114.00	-30.71	Horizontal
2480.00	93.76	27.64	2.99	39.05	85.34	114.00	-28.66	Vertical
2480.00	91.77	27.64	2.99	39.05	83.35	114.00	-30.65	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2402.00	83.87	27.43	2.93	38.88	75.35	94.00	-18.65	Vertical
2402.00	82.09	27.43	2.93	38.88	73.57	94.00	-20.43	Horizontal
2441.00	83.59	27.55	2.96	38.98	75.12	94.00	-18.88	Vertical
2441.00	81.54	27.55	2.96	38.98	73.07	94.00	-20.93	Horizontal
2480.00	83.13	27.64	2.99	39.05	74.71	94.00	-19.29	Vertical
2480.00	80.84	27.64	2.99	39.05	72.42	94.00	-21.58	Horizontal

Note: RBW 3MHz VBW 10MHz PK detector is for PK ,RMS detector is for AV

7.3.2 Spurious emissions

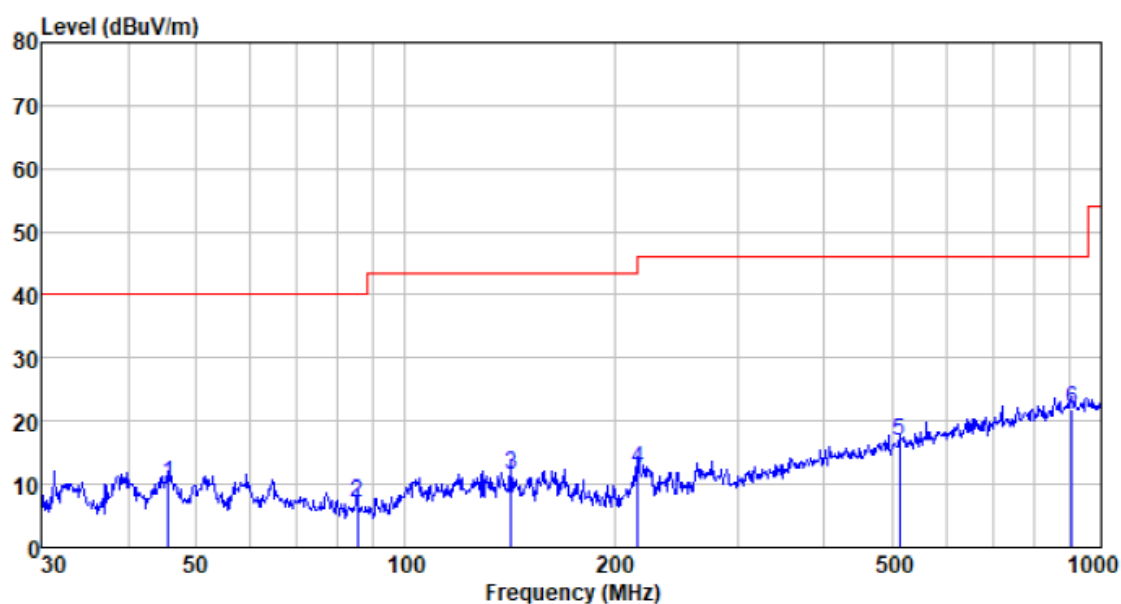
■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

■ Below 1GHz

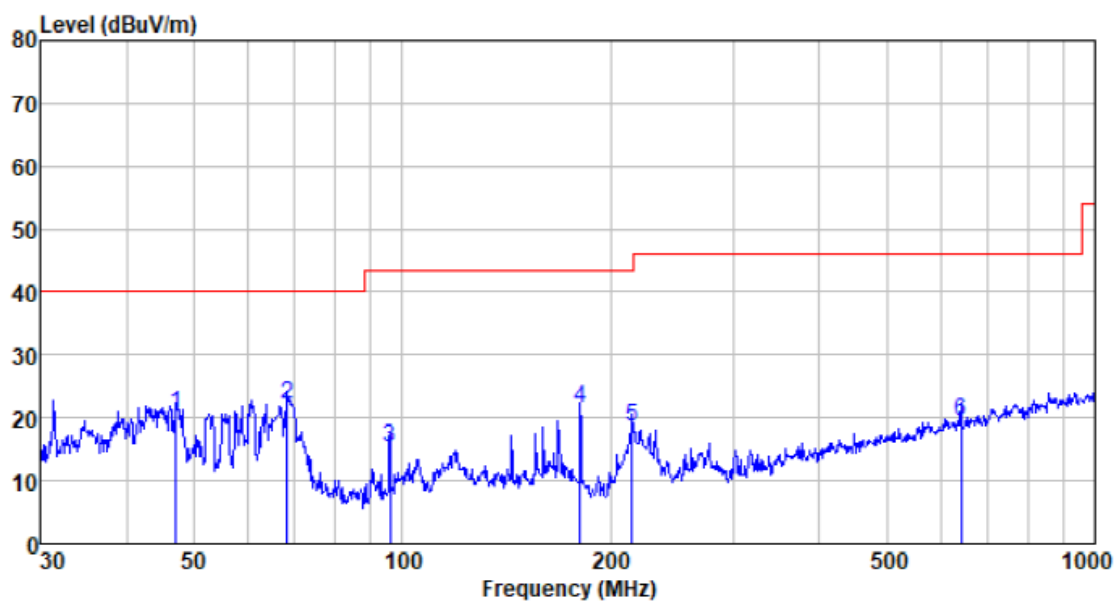
Pre-scan all test modes, found worst case at GFSK 2402MHz, and so only show the test result of it.

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
45.695	26.02	13.32	0.73	30.00	10.07	40.00	-29.93	QP
85.298	27.29	8.74	1.07	30.00	7.10	40.00	-32.90	QP
141.826	27.57	12.42	1.52	30.00	11.51	43.50	-31.99	QP
216.024	30.43	10.09	1.93	30.00	12.45	46.00	-33.55	QP
513.633	25.63	17.85	3.36	30.00	16.84	46.00	-29.16	QP
906.482	23.02	23.95	4.88	30.00	21.85	46.00	-24.15	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
47.160	36.53	13.28	0.74	30.00	20.55	40.00	-19.45	QP
68.151	40.42	10.86	0.93	30.00	22.21	40.00	-17.79	QP
96.099	34.85	9.28	1.16	30.00	15.29	43.50	-28.21	QP
180.649	39.46	10.26	1.74	30.00	21.46	43.50	-22.04	QP
214.514	36.62	10.01	1.93	30.00	18.56	43.50	-24.94	QP
640.611	25.76	19.94	3.87	30.00	19.57	46.00	-26.43	QP

■ Above 1GHz

■ Pre-scan all test modes, found worst case at GFSK, and so only show the test result of it.

Test channel:	Lowest channel
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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
4804.00	34.75	31.78	8.60	32.09	43.04	74.00	-30.96	Vertical
7206.00	30.13	36.15	11.65	32.00	45.93	74.00	-28.07	Vertical
9608.00	29.96	37.95	14.14	31.62	50.43	74.00	-23.57	Vertical
4804.00	38.51	31.78	8.60	32.09	46.80	74.00	-27.20	Horizontal
7206.00	31.66	36.15	11.65	32.00	47.46	74.00	-26.54	Horizontal
9608.00	29.14	37.95	14.14	31.62	49.61	74.00	-24.39	Horizontal

Average 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
4804.00	24.05	31.78	8.60	32.09	32.34	54.00	-21.66	Vertical
7206.00	19.11	36.15	11.65	32.00	34.91	54.00	-19.09	Vertical
9608.00	18.35	37.95	14.14	31.62	38.82	54.00	-15.18	Vertical
4804.00	27.99	31.78	8.60	32.09	36.28	54.00	-17.72	Horizontal
7206.00	21.11	36.15	11.65	32.00	36.91	54.00	-17.09	Horizontal
9608.00	17.86	37.95	14.14	31.62	38.33	54.00	-15.67	Horizontal

Test channel:	Middle channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	35.29	31.85	8.67	32.12	43.69	74.00	-30.31	Vertical
7323.00	30.50	36.37	11.72	31.89	46.70	74.00	-27.30	Vertical
9764.00	30.28	38.35	14.25	31.62	51.26	74.00	-22.74	Vertical
4882.00	39.17	31.85	8.67	32.12	47.57	74.00	-26.43	Horizontal
7323.00	32.07	36.37	11.72	31.89	48.27	74.00	-25.73	Horizontal
9764.00	29.51	38.35	14.25	31.62	50.49	74.00	-23.51	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	24.49	31.85	8.67	32.12	32.89	54.00	-21.11	Vertical
7323.00	19.41	36.37	11.72	31.89	35.61	54.00	-18.39	Vertical
9764.00	18.61	38.35	14.25	31.62	39.59	54.00	-14.41	Vertical
4882.00	28.50	31.85	8.67	32.12	36.90	54.00	-17.10	Horizontal
7323.00	21.45	36.37	11.72	31.89	37.65	54.00	-16.35	Horizontal
9764.00	18.18	38.35	14.25	31.62	39.16	54.00	-14.84	Horizontal

Test channel:	Highest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	35.47	31.93	8.73	32.16	43.97	74.00	-30.03	Vertical
7440.00	30.61	36.59	11.79	31.78	47.21	74.00	-26.79	Vertical
9920.00	30.38	38.81	14.38	31.88	51.69	74.00	-22.31	Vertical
4960.00	39.38	31.93	8.73	32.16	47.88	74.00	-26.12	Horizontal
7440.00	32.21	36.59	11.79	31.78	48.81	74.00	-25.19	Horizontal
9920.00	29.63	38.81	14.38	31.88	50.94	74.00	-23.06	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	24.66	31.93	8.73	32.16	33.16	54.00	-20.84	Vertical
7440.00	19.53	36.59	11.79	31.78	36.13	54.00	-17.87	Vertical
9920.00	18.72	38.81	14.38	31.88	40.03	54.00	-13.97	Vertical
4960.00	28.69	31.93	8.73	32.16	37.19	54.00	-16.81	Horizontal
7440.00	21.58	36.59	11.79	31.78	38.18	54.00	-15.82	Horizontal
9920.00	18.30	38.81	14.38	31.88	39.61	54.00	-14.39	Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

7.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

Test channel:	Lowest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	42.13	27.14	2.81	38.64	33.44	74.00	-40.56	Horizontal
2390.00	43.54	27.37	2.91	38.84	34.98	74.00	-39.02	Horizontal
2400.00	60.42	27.41	2.92	38.86	51.89	74.00	-22.11	Horizontal
2310.00	43.01	27.14	2.81	38.64	34.32	74.00	-39.68	Vertical
2390.00	44.15	27.37	2.91	38.84	35.59	74.00	-38.41	Vertical
2400.00	62.53	27.41	2.92	38.86	54.00	74.00	-20.00	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	32.66	27.14	2.81	38.64	23.97	54.00	-30.03	Horizontal
2390.00	33.94	27.37	2.91	38.84	25.38	54.00	-28.62	Horizontal
2400.00	45.21	27.41	2.92	38.86	36.68	54.00	-17.32	Horizontal
2310.00	33.30	27.14	2.81	38.64	24.61	54.00	-29.39	Vertical
2390.00	33.93	27.37	2.91	38.84	25.37	54.00	-28.63	Vertical
2400.00	46.93	27.41	2.92	38.86	38.40	54.00	-15.60	Vertical

Test channel:	Highest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	45.72	27.82	2.99	39.05	37.48	74.00	-36.52	Horizontal
2500.00	44.77	27.70	3.01	39.10	36.38	74.00	-37.62	Horizontal
2483.50	46.67	27.82	2.99	39.05	38.43	74.00	-35.57	Vertical
2500.00	45.83	27.70	3.01	39.10	37.44	74.00	-36.56	Vertical

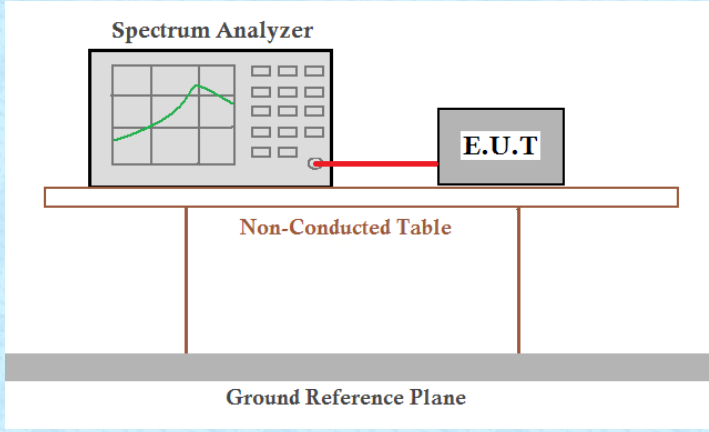
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	36.77	27.82	2.99	39.05	28.53	54.00	-25.47	Horizontal
2500.00	34.68	27.70	3.01	39.10	26.29	54.00	-27.71	Horizontal
2483.50	38.04	27.82	2.99	39.05	29.80	54.00	-24.20	Vertical
2500.00	34.66	27.70	3.01	39.10	26.27	54.00	-27.73	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
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

Test channel		20dB bandwidth(MHz)	Result
GFSK	Lowest	0.9509	Pass
	Middle	0.9493	Pass
	Highest	0.9510	Pass
$\pi/4$ -DQPSK	Lowest	1.279	Pass
	Middle	1.279	Pass
	Highest	1.280	Pass

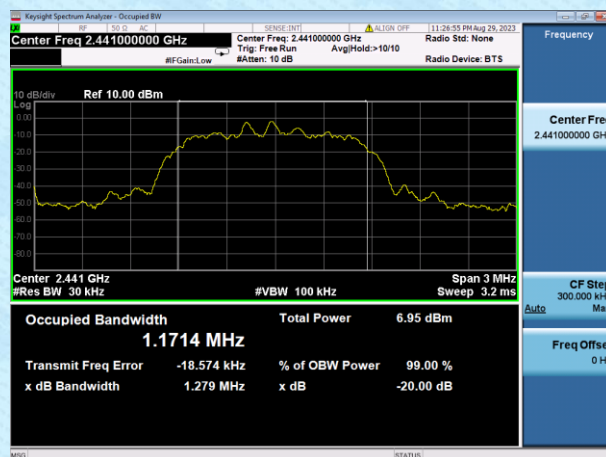
Test plot as follows:

GFSK

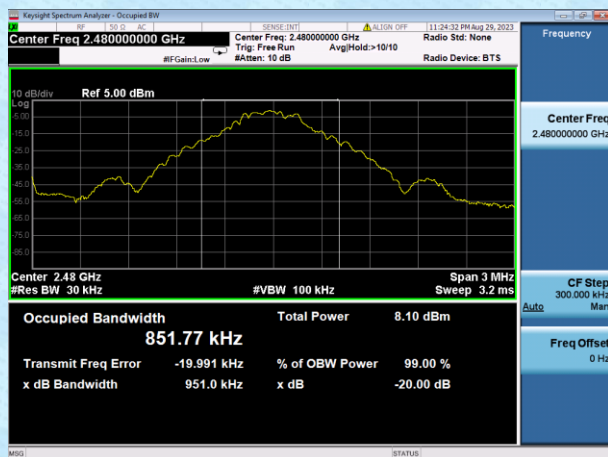
$\pi/4$ -DQPSK



Lowest channel



Middle channel



Highest channel

8 Test Setup Photo

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

9 EUT Constructional Details

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

-----End-----