

TEST REPORT

Applicant: Sinco Intelligent Technology Co., Ltd.

Address of Applicant: Room 805-807, No. 17, Wenheng Street, Sanzao Town, Jinwan District, Zhuhai City, China

Manufacturer/Factory: Sinco Intelligent Technology Co., Ltd.

Address of Manufacturer/Factory: Room 805-807, No. 17, Wenheng Street, Sanzao Town, Jinwan District, Zhuhai City, China

Equipment Under Test (EUT)

Product Name: Amp Modeler/Effects Processor

Model No.: MK-300, PD36, EK001

Trade Mark: M-VAVE, ZIRON, Leo Jaymz, Yuimer, EROK, AZOR, LEKATO, CASON, SquareMoon, GEAR4MUSIC, EKO, JAMKING

FCC ID: 2ARCP-MK-300

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

Date of sample receipt: Feb. 12, 2025

Date of Test: Feb. 12, 2025 ~ Apr. 10, 2025

Date of report issued: Apr. 10, 2025

Test Result : PASS *

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

Authorized Signature:

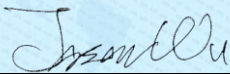
Robinson Luo
Laboratory Manager

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.

2 Version

Version No.	Date	Description
00	Apr. 10, 2025	Original

Prepared By:

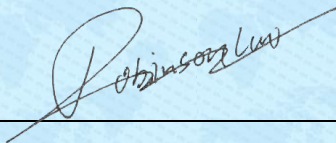


Date:

Apr. 10, 2025

Project Engineer

Check By:



Date:

Apr. 10, 2025

Reviewer

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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

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. N/A: Not applicable.
3. Test according to ANSI C63.10:2013

4.1 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 3\text{dB}$
6	Conducted Spurious emissions	$\pm 2.58\text{dB}$
7	AC Power Line Conducted Emission	$\pm 3.44\text{dB}$ (0.15MHz ~ 30MHz)
8	Radiated Spurious emission test	$\pm 3.1\text{dB}$ (9kHz-30MHz)
		$\pm 3.8039\text{dB}$ (30MHz-200MHz)
		$\pm 3.9679\text{dB}$ (200MHz-1GHz)
		$\pm 4.29\text{dB}$ (1GHz-18GHz)
		$\pm 3.30\text{dB}$ (18GHz-40GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Time	$\pm 3\%$

5 General Information

5.1 General Description of EUT

Product Name:	Amp Modeler/Effects Processor
Model No.:	MK-300, PD36, EK001
Test Model No.:	MK-300
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The only difference is model name and Product color.	
Serial No.:	N/A
Hardware Version:	H1.0
Software Version:	S1.0
Test sample(s) ID:	GTSL2025040098-1
Sample(s) Status	Engineered sample
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type:	Wire Antenna
Antenna gain:	3.04dBi(declare by applicant)
Power supply:	DC 5.0V from adapter or DC 3.7V from Li-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	2441MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
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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(Only show the worst case:Y axis) and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)			

Final Test Mode:

The EUT was tested in GFSK, $\pi/4$ -DQPSK, 8-DPSK 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

None.

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	Jun. 22, 2024	Jun. 21, 2027
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	Apr. 11, 2024	Apr. 10, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	Mar. 18, 2025	Mar. 17, 2026
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	Apr. 17, 2023	Apr. 16, 2025
6	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	Apr. 11, 2024	Apr. 10, 2025
7	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov.12, 2024	Nov.11, 2025
8	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	Apr. 11, 2024	Apr. 10, 2025
9	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	Apr. 11, 2024	Apr. 10, 2025
10	Horn Antenna (18GH-40GHz)	Schwarzbeck	BBHA 9170	GTS691	Jul. 05, 2024	Jul. 04, 2025
11	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	Mar. 11, 2025	Mar. 10, 2026
12	Amplifier	/	LNA-1000-30S	GTS650	Apr. 11, 2024	Apr. 10, 2025
13	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 07, 2024	Nov. 06, 2025
14	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	Apr. 11, 2024	Apr. 10, 2025
15	Thermo meter	JINCHUANG	GSP-8A	GTS643	Apr. 18, 2024	Apr. 17, 2025
16	RE cable 1	GTS	N/A	GTS675	Jul. 02, 2024	Jul. 01, 2025
17	RE cable 2	GTS	N/A	GTS676	Jul. 02, 2024	Jul. 01, 2025
18	RE cable 3	GTS	N/A	GTS677	Jul. 02, 2024	Jul. 01, 2025
19	RE cable 4	GTS	N/A	GTS678	Jul. 02, 2024	Jul. 01, 2025
20	RE cable 5	GTS	N/A	GTS679	Jul. 02, 2024	Jul. 01, 2025
21	RE cable 6	GTS	N/A	GTS680	Jul. 02, 2024	Jul. 01, 2025
22	RE cable 7	GTS	N/A	GTS681	Jul. 05, 2024	Jul. 04, 2025
23	RE cable 8	GTS	N/A	GTS682	Jul. 05, 2024	Jul. 04, 2025
24	EMI Test Software	AUDIX	E3-6.100614a	GTS725	N/A	N/A

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	Jul. 12, 2022	Jul. 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Apr. 11, 2024	Apr. 10, 2025
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	Apr. 11, 2024	Apr. 10, 2025
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	Thermo meter	JINCHUANG	GSP-8A	GTS642	Apr. 18, 2024	Apr. 17, 2025
6	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	Apr. 11, 2024	Apr. 10, 2025
7	ISN	SCHWARZBECK	NTFM 8158	GTS565	Apr. 11, 2024	Apr. 10, 2025
8	High voltage probe	SCHWARZBECK	TK9420	GTS537	Apr. 11, 2024	Apr. 10, 2025
9	Antenna end assembly	Weinschel	1870A	GTS560	Apr. 11, 2024	Apr. 10, 2025
10	EMI Test Software	AUDIX	E3-6.100622	GTS726	N/A	N/A

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	Apr. 13, 2024	Apr. 12, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Apr. 13, 2024	Apr. 12, 2025
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	Apr. 13, 2024	Apr. 12, 2025
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	Apr. 13, 2024	Apr. 12, 2025
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	Apr. 13, 2024	Apr. 12, 2025
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	Apr. 13, 2024	Apr. 12, 2025
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	Apr. 13, 2024	Apr. 12, 2025
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	Apr. 13, 2024	Apr. 12, 2025
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	Apr. 18, 2024	Apr. 17, 2025

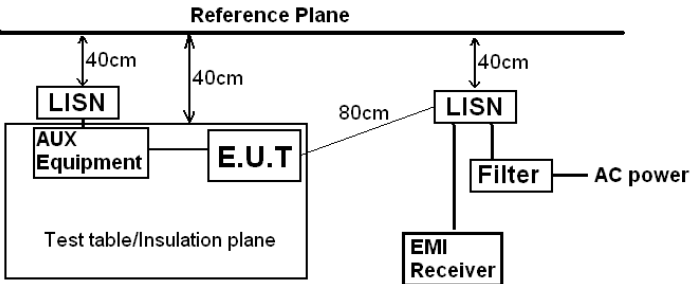
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	Apr. 18, 2024	Apr. 17, 2025

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 wire antenna, reference to the appendix II for details.	

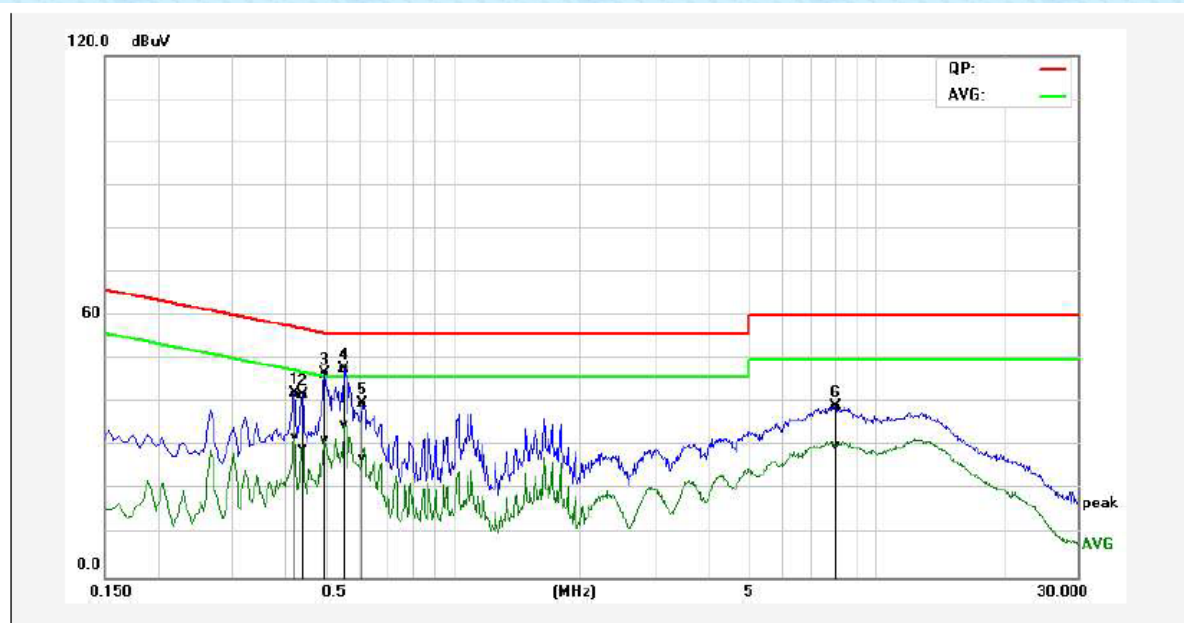
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Class / Severity:	Class B						
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  Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
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:	AC 120V, 60Hz						
Test results:	Pass						

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

Measurement data

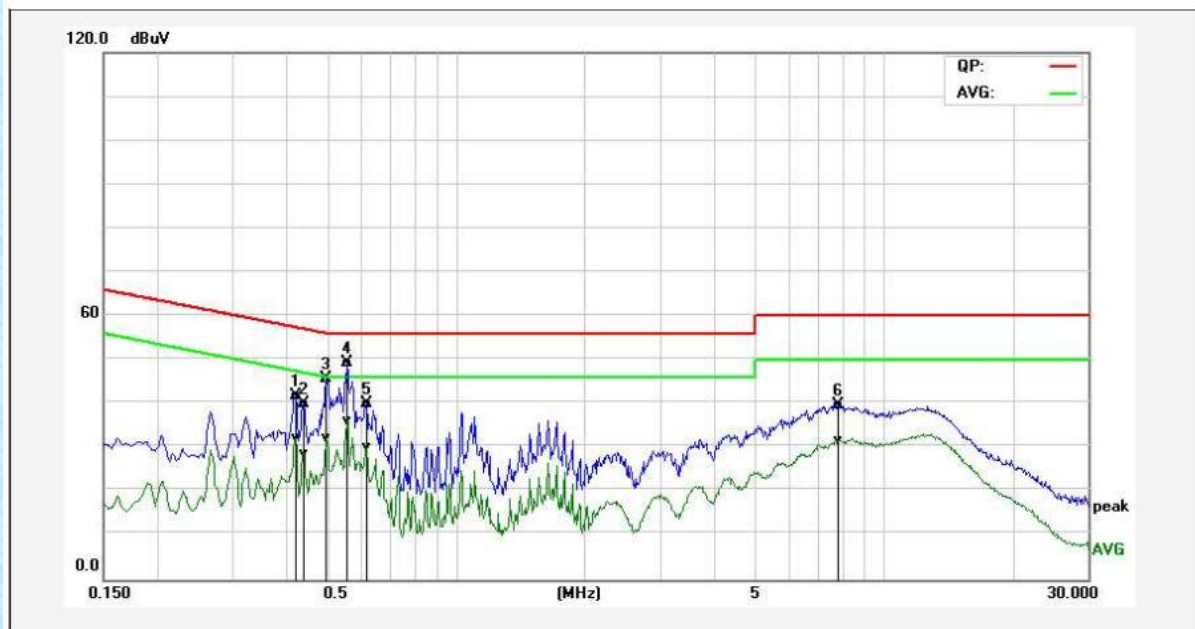
Temperature:	26℃	Relative Humidity:	60%
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of 8DPSK 2441MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.4220	32.16	21.91	10.07	42.23	31.98	57.41	47.41	-15.18	-15.43	Pass
2P	0.4420	31.69	19.50	10.07	41.76	29.57	57.02	47.02	-15.26	-17.45	Pass
3P	0.4980	36.59	21.16	10.08	46.67	31.24	56.03	46.03	-9.36	-14.79	Pass
4*	0.5540	37.79	24.79	10.07	47.86	34.86	56.00	46.00	-8.14	-11.14	Pass
5P	0.6100	29.66	16.97	10.06	39.72	27.03	56.00	46.00	-16.28	-18.97	Pass
6P	8.0460	28.59	19.68	10.52	39.11	30.20	60.00	50.00	-20.89	-19.80	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

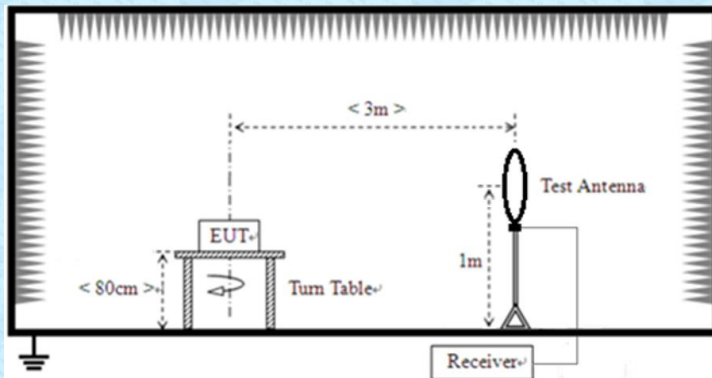
Temperature:	26℃	Relative Humidity:	60%
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of 8DPSK 2441MHz		

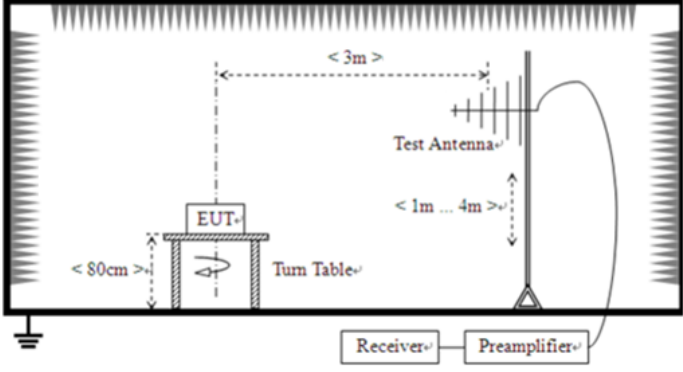
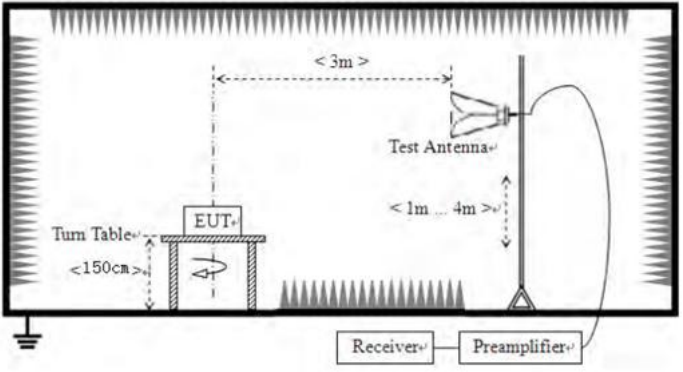


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.4220	31.82	22.31	10.07	41.89	32.38	57.41	47.41	-15.52	-15.03	Pass
2P	0.4420	29.85	18.49	10.07	39.92	28.56	57.02	47.02	-17.10	-18.46	Pass
3P	0.4980	35.71	22.28	10.08	45.79	32.36	56.03	46.03	-10.24	-13.67	Pass
4*	0.5580	39.36	26.23	10.07	49.43	36.30	56.00	46.00	-6.57	-9.70	Pass
5P	0.6180	29.86	20.03	10.06	39.92	30.09	56.00	46.00	-16.08	-15.91	Pass
6P	7.8380	29.20	21.04	10.53	39.73	31.57	60.00	50.00	-20.27	-18.43	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

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:	<table><tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr><tr><td>9kHz-150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>300Hz</td><td>Quasi-peak Value</td></tr><tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>10kHz</td><td>Quasi-peak Value</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr></table> Note: For Duty cycle ≥ 98%, average detector set as above, For Duty cycle < 98%, average detector set as below: VBW ≥ 1 / T				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
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)	<table><tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr><tr><td rowspan="2">2400MHz-2483.5MHz</td><td>94.00</td><td>Average Value</td></tr><tr><td>114.00</td><td>Peak Value</td></tr></table>		Frequency	Limit (dBuV/m @3m)	Remark	2400MHz-2483.5MHz	94.00	Average Value	114.00	Peak Value																							
Frequency	Limit (dBuV/m @3m)	Remark																															
2400MHz-2483.5MHz	94.00	Average Value																															
	114.00	Peak Value																															
Limit: (Spurious Emissions)	<table><tr><th>Frequency</th><th>Limit (uV/m)</th><th>Remark</th></tr><tr><td>0.009MHz-0.490MHz</td><td>2400/F(kHz) @300m</td><td>Quasi-peak Value</td></tr><tr><td>0.490MHz-1.705MHz</td><td>24000/F(kHz) @30m</td><td>Quasi-peak Value</td></tr><tr><td>1.705MHz-30.0MHz</td><td>30 @30m</td><td>Quasi-peak Value</td></tr><tr><td>30MHz-88MHz</td><td>100 @3m</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>150 @3m</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>200 @3m</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>500 @3m</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>500 @3m</td><td>Average Value</td></tr><tr><td>5000 @3m</td><td>Peak Value</td></tr></table>		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		
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 to 1GHz																																

	 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:	AC 120V, 60Hz
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

GFSK:

Test frequency (MHz)	Fundamental Frequency (MHz)	Field strength of fundamental level (dB μ V/m)		Limit (dBuV)		Result	Antenna Pole (H/V)
		AVG	Peak	AVG	Peak		
2402	2402.964	80.13	99.26	94	114	Pass	H
	2402.966	80.15	99.32	94	114	Pass	V
2441	2441.755	80.26	99.45	94	114	Pass	H
	2441.574	80.22	99.50	94	114	Pass	V
2480	2481.752	80.16	99.24	94	114	Pass	H
	2480.174	80.11	99.15	94	114	Pass	V

$\pi/4$ -DQPSK:

Test frequency (MHz)	Fundamental Frequency (MHz)	Field strength of fundamental level (dB μ V/m)		Limit (dBuV)		Result	Antenna Pole (H/V)
		AVG	Peak	AVG	Peak		
2402	2402.956	80.11	99.22	94	114	Pass	H
	2402.915	80.15	99.31	94	114	Pass	V
2441	2441.745	80.21	99.45	94	114	Pass	H
	2441.555	80.22	99.50	94	114	Pass	V
2480	2481.745	80.11	99.14	94	114	Pass	H
	2480.126	80.13	99.12	94	114	Pass	V

8-DPSK:

Test frequency (MHz)	Fundamental Frequency (MHz)	Field strength of fundamental level (dB μ V/m)		Limit (dBuV)		Result	Antenna Pole (H/V)
		AVG	Peak	AVG	Peak		
2402	2402.966	80.15	99.22	94	114	Pass	H
	2402.968	80.16	99.31	94	114	Pass	V
2441	2441.778	80.15	99.45	94	114	Pass	H
	2441.585	80.22	99.45	94	114	Pass	V
2480	2481.745	80.15	99.15	94	114	Pass	H
	2480.168	80.19	99.12	94	114	Pass	V

7.3.2 Spurious emissions

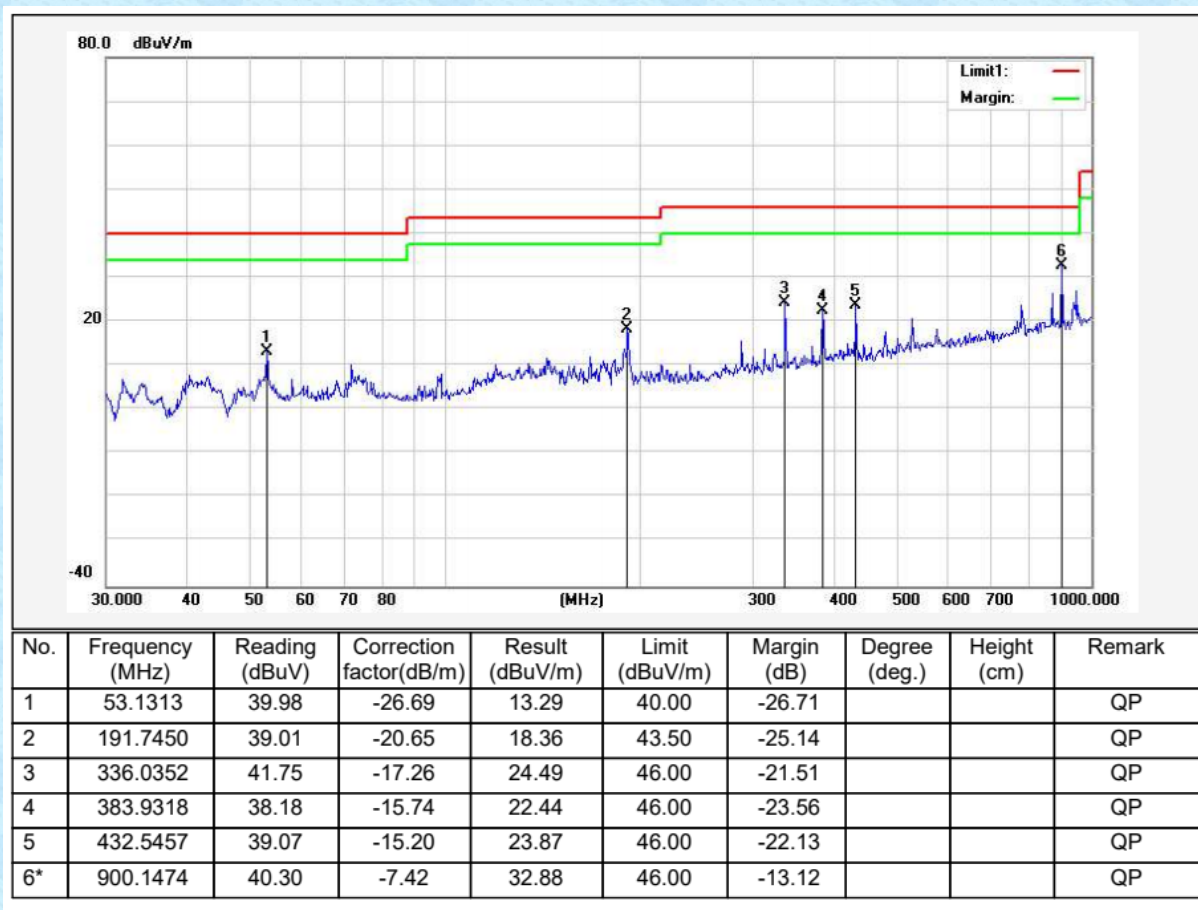
■ Below 30MHz

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.

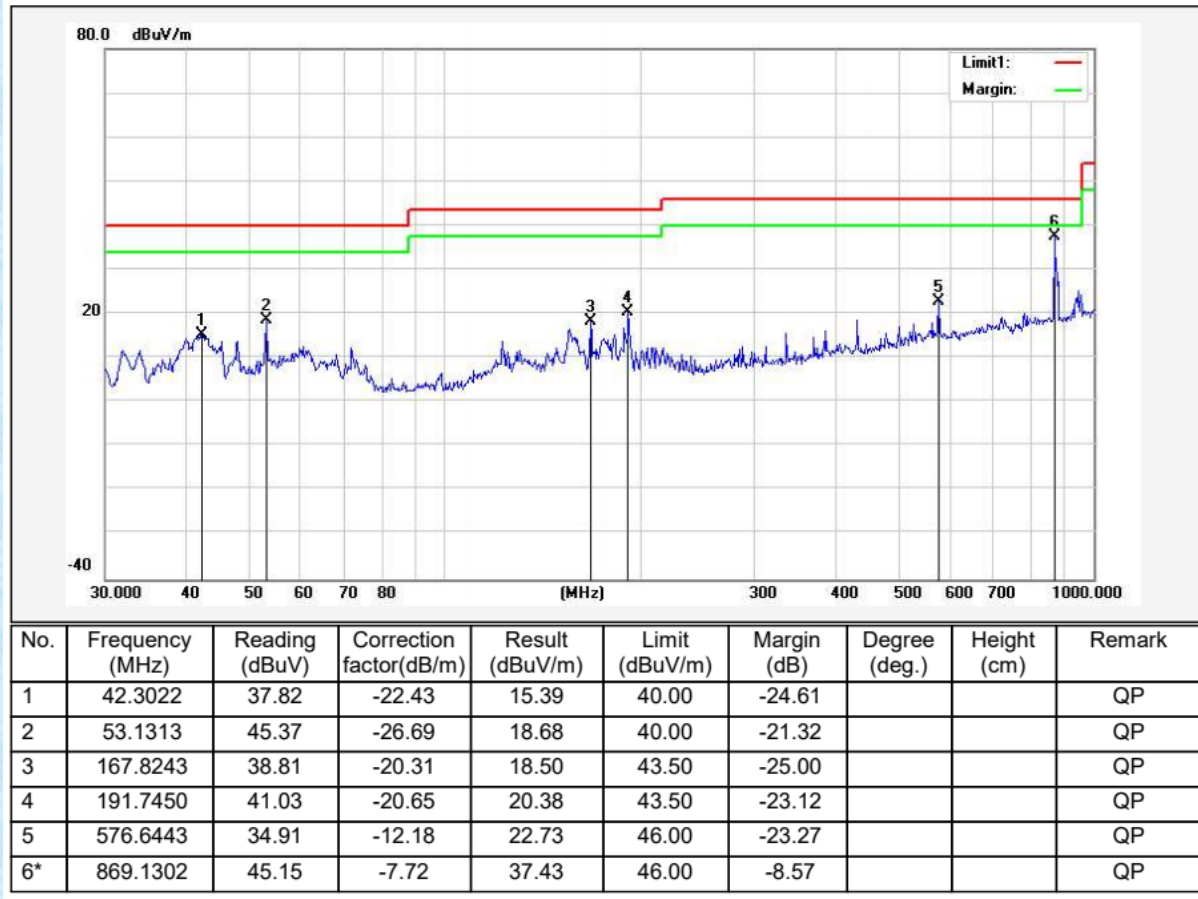
■ Below 1GHz

Between 30MHz – 1GHz

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 8DPSK 2441MHz		



Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 8DPSK 2441MHz		



Remarks:

- 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.

GFSK 1GHz~25GHz

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:2402MHz									
V	4804.00	54.46	30.55	5.77	24.66	54.34	74	-19.66	Pk
V	4804.00	43.28	30.55	5.77	24.66	43.16	54	-10.84	AV
V	7206.00	54.18	30.33	6.32	24.55	54.72	74	-19.28	Pk
V	7206.00	43.64	30.33	6.32	24.55	44.18	54	-9.82	AV
V	9608.00	52.64	30.85	7.45	24.69	53.93	74	-20.07	Pk
V	9608.00	43.47	30.85	7.45	24.69	44.76	54	-9.24	AV
V	12010.00	52.67	31.02	8.99	25.57	56.21	74	-17.79	Pk
V	12010.00	43.21	31.02	8.99	25.57	46.75	54	-7.25	AV
H	4804.00	51.35	30.55	5.77	24.66	51.23	74	-22.77	Pk
H	4804.00	43.52	30.55	5.77	24.66	43.4	54	-10.6	AV
H	7206.00	54.57	30.33	6.32	24.55	55.11	74	-18.89	Pk
H	7206.00	43.18	30.33	6.32	24.55	43.72	54	-10.28	AV
H	9608.00	52.82	30.85	7.45	24.69	54.11	74	-19.89	Pk
H	9608.00	43.98	30.85	7.45	24.69	45.27	54	-8.73	AV
H	12010.00	54.94	31.02	8.99	25.57	58.48	74	-15.52	Pk
H	12010.00	43.55	31.02	8.99	25.57	47.09	54	-6.91	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:2441MHz									
V	4882.00	50.22	30.55	5.77	24.66	50.1	74	-23.9	Pk
V	4882.00	43.38	30.55	5.77	24.66	43.26	54	-10.74	AV
V	7323.00	50.68	30.33	6.32	24.55	51.22	74	-22.78	Pk
V	7323.00	43.55	30.33	6.32	24.55	44.09	54	-9.91	AV
V	9764.00	54.24	30.85	7.45	24.69	55.53	74	-18.47	Pk
V	9764.00	43.55	30.85	7.45	24.69	44.84	54	-9.16	AV
V	12205.00	54.48	31.02	8.99	25.57	58.02	74	-15.98	Pk
V	12205.00	43.12	31.02	8.99	25.57	46.66	54	-7.34	AV
H	4882.00	51.55	30.55	5.77	24.66	51.43	74	-22.57	Pk

H	4882.00	43.92	30.55	5.77	24.66	43.8	54	-10.2	AV
H	7323.00	50.35	30.33	6.32	24.55	50.89	74	-23.11	Pk
H	7323.00	43.97	30.33	6.32	24.55	44.51	54	-9.49	AV
H	9764.00	53.55	30.85	7.45	24.69	54.84	74	-19.16	Pk
H	9764.00	43.16	30.85	7.45	24.69	44.45	54	-9.55	AV
H	12205.00	53.32	31.02	8.99	25.57	56.86	74	-17.14	Pk
H	12205.00	43.27	31.02	8.99	25.57	46.81	54	-7.19	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2480MHz									
V	4960.00	50.66	30.55	5.77	24.66	50.54	74	-23.46	Pk
V	4960.00	43.49	30.55	5.77	24.66	43.37	54	-10.63	AV
V	7440.00	54.35	30.33	6.32	24.55	54.89	74	-19.11	Pk
V	7440.00	43.51	30.33	6.32	24.55	44.05	54	-9.95	AV
V	9920.00	51.49	30.85	7.45	24.69	52.78	74	-21.22	Pk
V	9920.00	43.29	30.85	7.45	24.69	44.58	54	-9.42	AV
V	12400.00	53.09	31.02	8.99	25.57	56.63	74	-17.37	Pk
V	12400.00	43.55	31.02	8.99	25.57	47.09	54	-6.91	AV
H	4960.00	54.19	30.55	5.77	24.66	54.07	74	-19.93	Pk
H	4960.00	43.35	30.55	5.77	24.66	43.23	54	-10.77	AV
H	7440.00	51.33	30.33	6.32	24.55	51.87	74	-22.13	Pk
H	7440.00	43.56	30.33	6.32	24.55	44.1	54	-9.9	AV
H	9920.00	50.52	30.85	7.45	24.69	51.81	74	-22.19	Pk
H	9920.00	43.81	30.85	7.45	24.69	45.1	54	-8.9	AV
H	12400.00	52.98	31.02	8.99	25.57	56.52	74	-17.48	Pk
H	12400.00	43.74	31.02	8.99	25.57	47.28	54	-6.72	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 4.All modes were tested, only GFSK data was recorded in the report.

7.3.3 Bandedge emissions

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

Operation Mode: TX CH00 (2402MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	57.44	-5.81	51.63	74	-22.37	PK
2310	/	-5.81	/	54	/	AV
2390	57.66	-5.84	51.82	74	-22.18	PK
2390	/	-5.84	/	54	/	AV
2400	57.55	-5.84	51.71	74	-22.29	PK
2400	/	-5.84	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	56.16	-5.81	50.35	74	-23.65	PK
2310	/	-5.81	/	54	/	AV
2390	56.57	-5.84	50.73	74	-23.27	PK
2390	/	-5.84	/	54	/	AV
2400	57.62	-5.84	51.78	74	-22.22	PK
2400	/	-5.84	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH78 (2480MHz)

Horizontal:

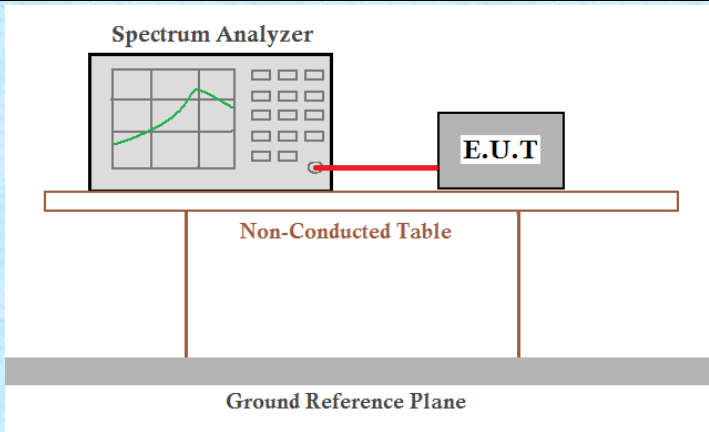
Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	55.62	-5.65	49.97	74	-24.03	PK
2483.5	/	-5.65	/	54	/	AV
2500	56.57	-5.72	50.85	74	-23.15	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	57.26	-5.65	51.61	74	-22.39	PK
2483.5	/	-5.65	/	54	/	AV
2500	56.54	-5.72	50.82	74	-23.18	PK
2500	/	-5.72	/	54	/	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Since the peak value is less than the average limit, the average value does not reflected in the report.

7.4 20dB Occupy Bandwidth

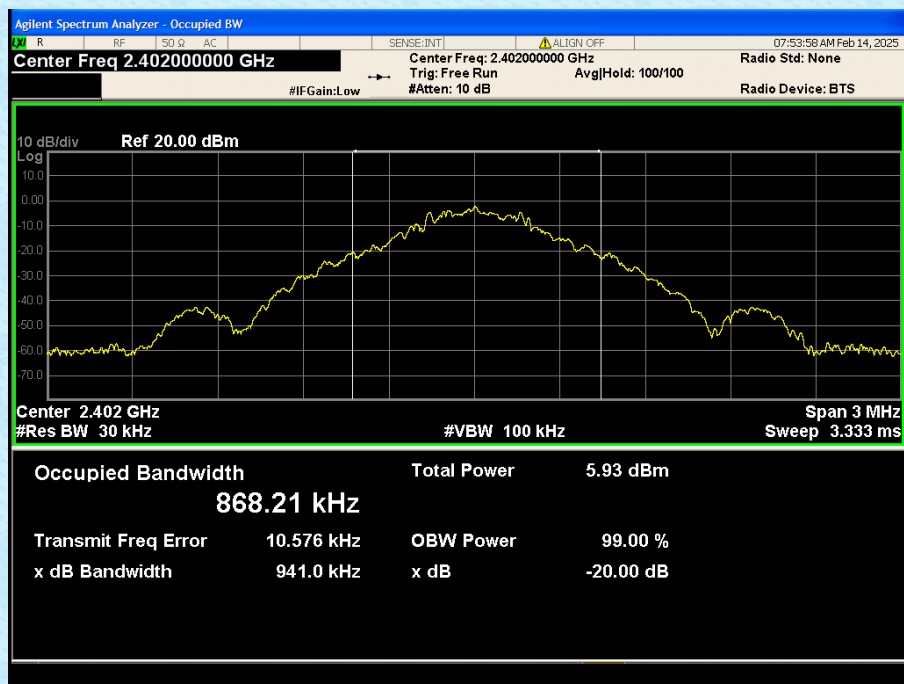
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and 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

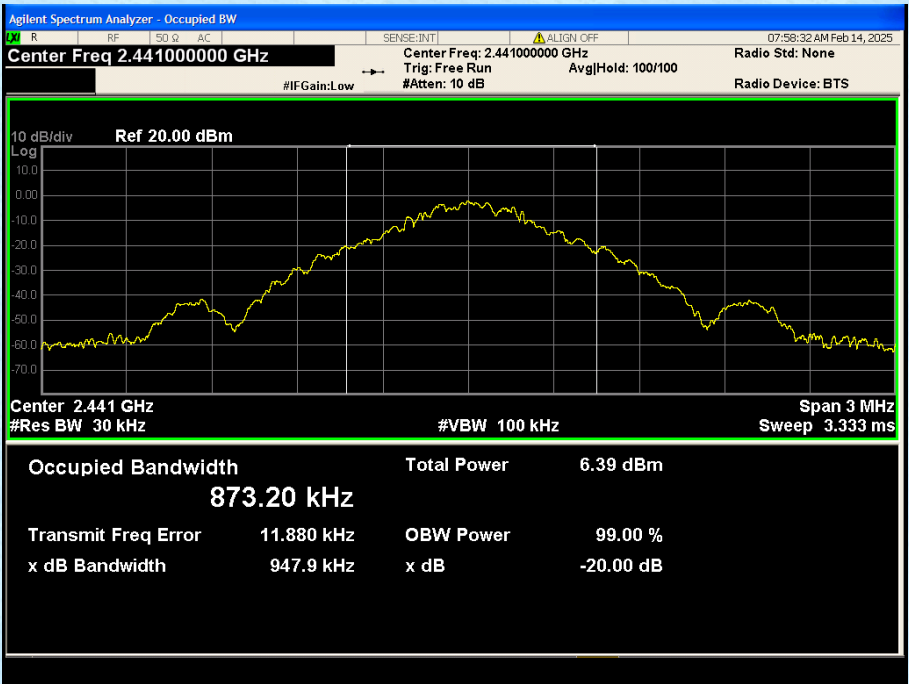
GFSK Modulation:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
CH00	2402	0.941	PASS
CH39	2441	0.948	PASS
CH78	2480	0.939	PASS

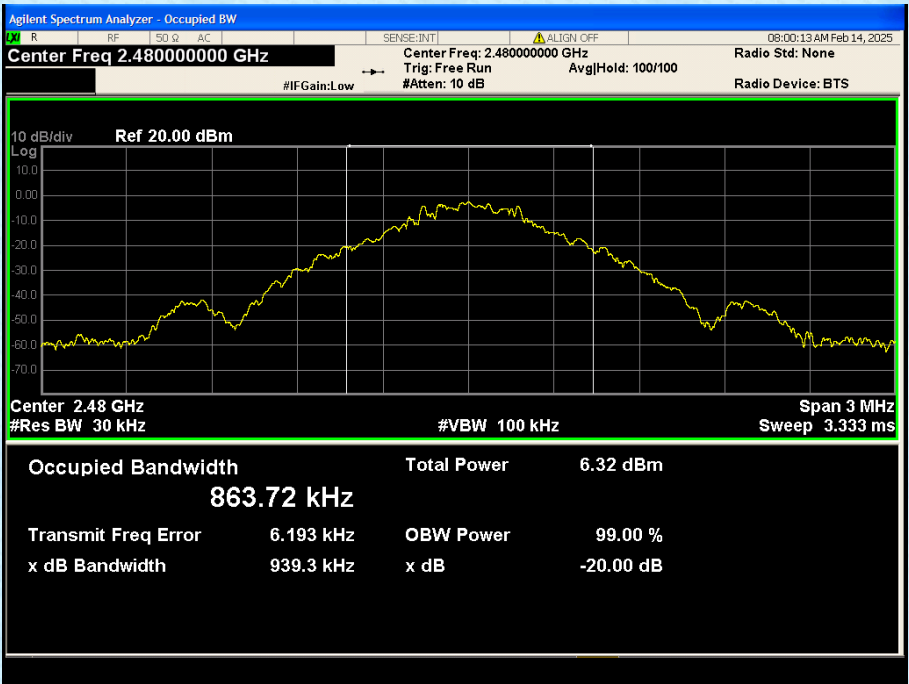
CH00: 2402MHz



CH39: 2441MHz



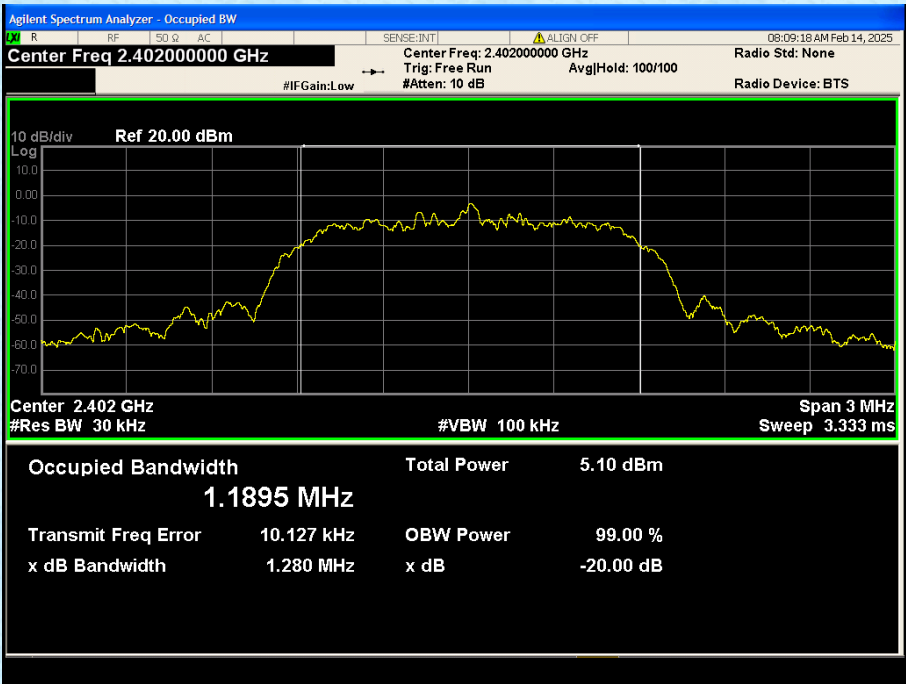
CH78: 2480MHz



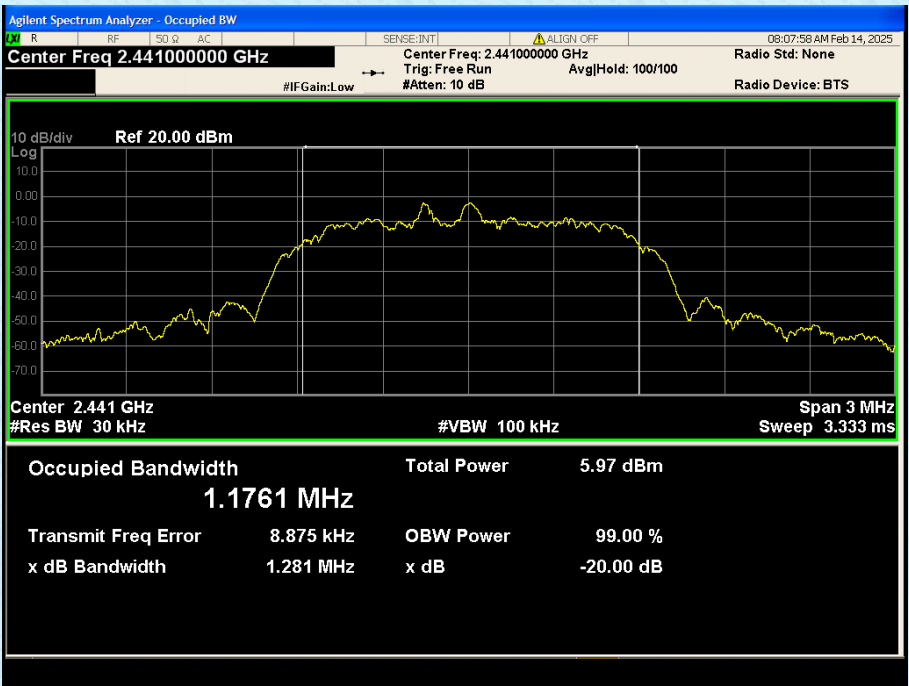
$\pi/4$ DQPSK Modulation:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
CH00	2402	1.280	PASS
CH39	2441	1.281	PASS
CH78	2480	1.266	PASS

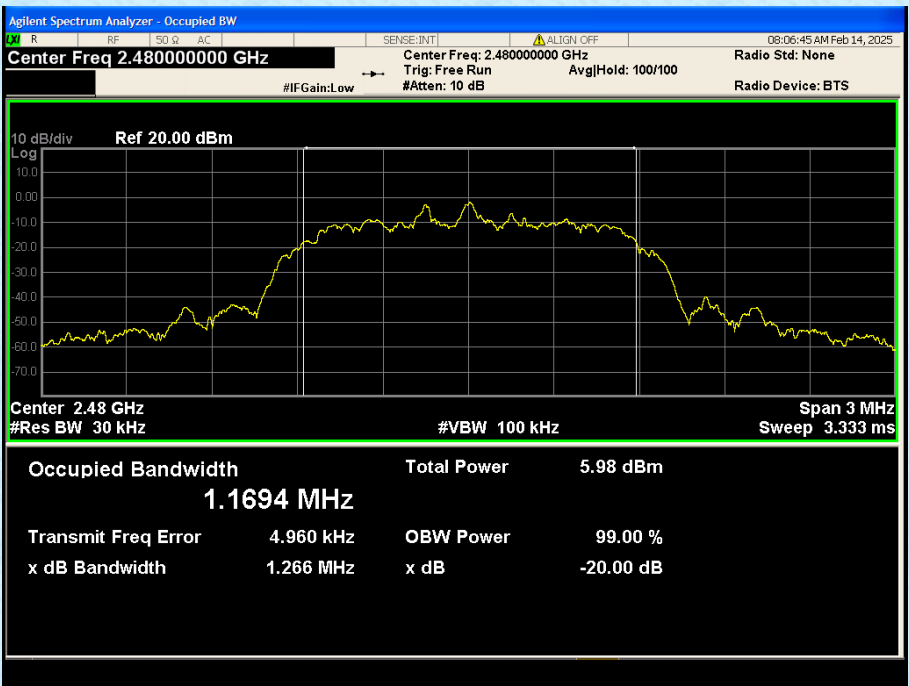
CH00: 2402MHz



CH39: 2441MHz



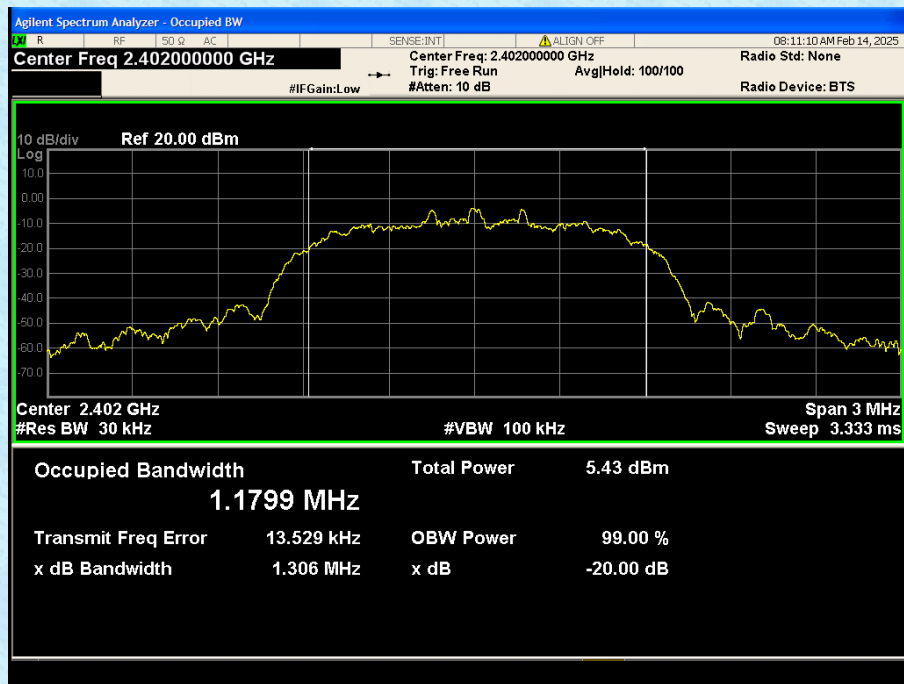
CH78: 2480MHz



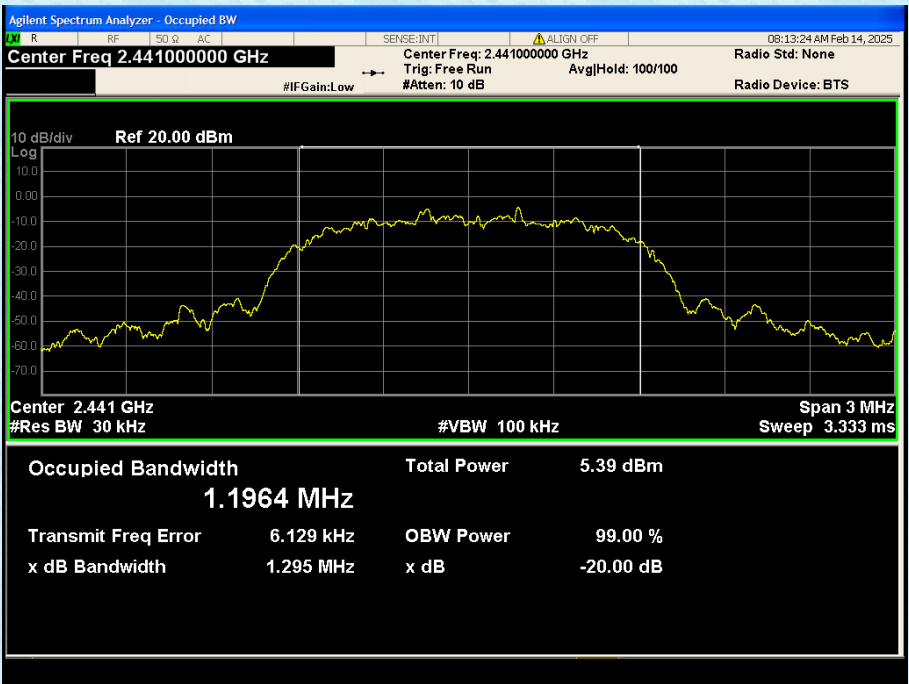
8DPSK Modulation:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
CH00	2402	1.306	PASS
CH39	2441	1.295	PASS
CH78	2480	1.259	PASS

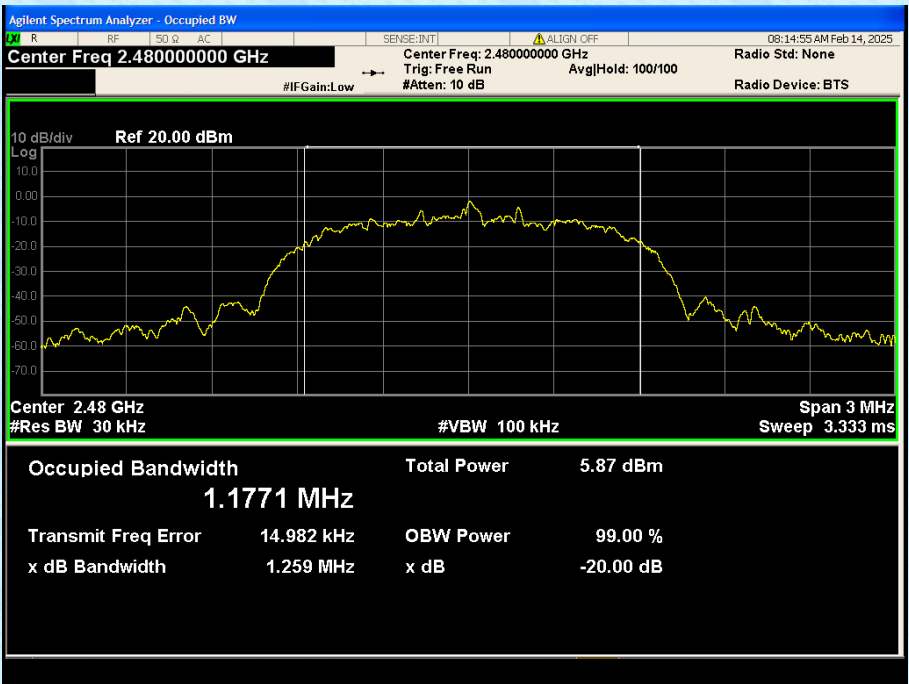
CH00: 2402MHz



CH39: 2441MHz



CH78: 2480MHz



8 Test Setup Photo

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

9 EUT Constructional Details

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

-----End-----