FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

TLV CO., LTD.

TrapMan

TM8

Brand: TLV

FCC ID: H3RTLVTM080

Prepared for : TLV CO., LTD.
881 Nagasuna, Noguchi, Kakogawa, Hyogo 675-8511 Japan

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District , Shenzhen, Guangdong, China

Tel: (0755) 26639496

TESTING
NVLAP LAB CODE 200372-0

Report Number	:	ACS-F24128
Date of Test	:	Jul.11~24, 2024
Date of Report	:	Aug.26, 2024

TABLE OF CONTENTS

TEST REPORT

Applicant	:	TLV CO., LTD.
Manufacturer	:	TLV CO., LTD.
Product	:	TrapMan
FCC ID	:	H3RTLVTM080
(A) Model No.	:	TM8
(B) Brand	:	TLV
(C) Test Voltage	:	DC 3.7V

Tested for comply with:
FCC CFR47 Part 15 Subpart C

Test procedure used:
ANSI C63.10: 2020+COR1:2023

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1074. No modifications were required during testing to bring this product into compliance.

This report applies to single evaluation of one sample of above mentioned product and shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd..

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Date of Test : Jul.11~24, 2024 Date of Report: Aug.26, 2024

Prepared by : Dora Yang
Dora Yang / Assistant

Reviewed by : Thomas Chen
Thomas Chen / Assistant Manager

AUDIX® 信華科技（深圳）有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report

Approved & Authorized Signer : Signature: Sunny Lu
Sunny Lu / Manager

1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC Part 15 : 15.207 ANSI C63.10: 2020+COR1:2023	PASS
Radiated Emission Test	FCC Part 15 15.209 FCC Part 15 15.205 FCC Part 15 15.247(d) ANSI C63.10: 2020+COR1:2023	PASS
Conducted Spurious Emissions	FCC Part 15: 15.247(d) ANSI C63.10 2020	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) ANSI C63.10: 2020+COR1:2023	PASS
20dB & 99% Bandwidth Test	FCC Part 15: 15.215© ANSI C63.10: 2020+COR1:2023	PASS
Number Of Hopping Frequency Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10: 2020+COR1:2023	PASS
Dwell Time Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10: 2020+COR1:2023	PASS
Maximum Peak Output Power Test	FCC Part 15 15.247(b)(1) ANSI C63.10: 2020+COR1:2023	PASS
Band Edge Compliance Test	FCC Part 15 15.247(d) ANSI C63.10: 2020+COR1:2023	PASS
Antenna requirement	FCC Part 15 : 15.203	PASS
Note: Measurement uncertainty affection to the result is not considered, the EUT is technically compliant with standard requirements.		

2. GENERAL INFORMATION

2.1. Description of Equipment Under Test

Applicant	TLV CO., LTD.
Applicant Address	881 Nagasuna, Noguchi, Kakogawa, Hyogo 675-8511 Japan
Manufacturer	TLV CO., LTD.
Manufacturer Address	881 Nagasuna, Noguchi, Kakogawa, Hyogo 675-8511 Japan
Product	TrapMan
Model No.	TM8
Brand	TLV
FCC ID	H3RTLVTM080
Sample Type	Mass production
Date of Receipt	Jun.27, 2024
Date of Test	Jul.11~24, 2024
Remark: This report only for BDR+EDR.	

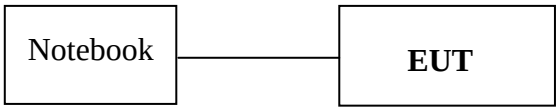
2.2. Feature of Equipment Under Test

Product Feature & Specification		
Product	TrapMan	
Model No.	TM8	
Power Source	☐ Commercial Power	AC 100~240 V
	☒ External Power Source	DC 3.7V
	☐ Li-ion Battery	DC V
	☐ UM battery	DC V
Bluetooth		
Radio	BDR +EDR; BLE	
Frequency Range	2402-2480MHz	
Type of Modulation	GFSK, π/4DQPSK, 8DPSK	
Data Rate	1Mbps, 2Mbps, 3Mbps	
Quantity of Channels	79	
Channel Separation	1MHz	
Antenna System		
Type of Antenna & Antenna Peak Gain	Bluetooth (2.402-2.480GHz) Antenna Antenna Type : PCB antenna Antenna Gain: 3.5dBi max	

2.3. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number
1.	Notebook	N/A	ACER	ZOW	N/A
		Power Cord(3C): Unshielded, Detachabled, 1.8m Power Adaptor: Manufacturer: Lite-On, M/N: PA-1900-32 Cable: Unshielded, Undetectable, 4.0m(Bond one ferrite core)			

2.4. Block Diagram of connection between EUT and simulators



(EUT: TrapMan)

2.5. Test information

A special software (ISRT.exe) was used to control EUT work in TX mode

Tested mode, Packet Type, peak output power information			
Mode	Packet Type	Output power(dBm) P max	Output Power(dBm) P low
GFSK	DH1	8.818	7.972
	DH3		
	DH5		
8DPSK	3-DH1	9.433	8.501
	3-DH3		
	3-DH5		

Note: π/4DQPSK mode has been verified to have the lowest power, so the final test were performed with GFSK and 8DPSK mode, the worse-case packet type were:
GFSK Mode: DH5
8DPSK Mode: 3DH5

Item		Modulation	Data Rate	Test Channel
Radiated Test Case	Radiated Band Edge	GFSK	1Mbps	00/78
		8-DPSK	3Mbps	00/78
	Radiated Spurious Emission	GFSK	1Mbps	00/39/78
		8-DPSK	3Mbps	00/39/78
Conducted Test Case	20dB Bandwidth	GFSK	1Mbps	00/39/78
		8-DPSK	3Mbps	00/39/78
	Carrier Frequency Separation	GFSK	1Mbps	39
		8-DPSK	3Mbps	39
	Time of Occupancy	GFSK	1Mbps	39
		8-DPSK	3Mbps	39
	Number of Hopping Channels	GFSK	1Mbps	39
		8-DPSK	3Mbps	39
	Maximum Peak Output Power	GFSK	1Mbps	00/39/78
		8-DPSK	3Mbps	00/39/78
	Band Edges	GFSK	1Mbps	00/78
		8-DPSK	3Mbps	00/78
	Spurious Emission	GFSK	1Mbps	00/39/78
		8-DPSK	3Mbps	00/39/78

2.6. Test Facility

Site Description

Name of Firm : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District , Shenzhen, Guangdong, China

EMC Lab. : Certificated by ISED, Canada
Company Number: 5183A
CAB identifier: CN0034
Valid Date: Mar.31, 2025

Certificated by FCC, USA
Designation No.: CN5022
Valid Date: Mar.31, 2025

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Valid Date: Mar.31, 2026

2.7. Measurement Uncertainty (95% confidence levels, k=2)

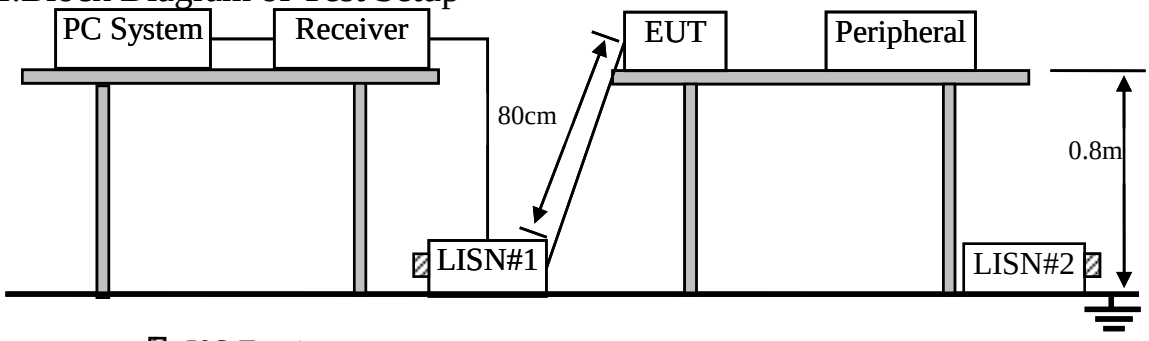
Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	±2.6dB(150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	±3.8dB(30~200MHz, Polarization: H)
	±3.8dB(30~200MHz, Polarization: V)
	±4.0dB(200M~1GHz, Polarization: H)
	±4.0dB(200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m chamber(1GHz-18GHz)	±4.0dB(1~6GHz, Distance: 3m)
	±4.0dB(6~18GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	±3.7dB(30MHz~1000MHz)
	±3.3dB(1~26.5GHz)
Uncertainty for Conduction Spurious emission test	±2.0dB
Uncertainty for Output power test	±0.8dB
Uncertainty for Bandwidth test	±4.6%
Uncertainty for DC power test	±0.1%
Uncertainty for test site temperature and humidity	±0.6℃
	±3%

3. POWER LINE CONDUCTED EMISSION TEST

3.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	Nov.09,22	3 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100842	Mar.16,24	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ENV216	102160	Jun.19,24	1 Year
4.	RF Cable	Eastsheep	RG223	190424	Sep.15,23	1 Year
5.	Test Software	AUDIX	e3	6.100913a	N/A	N/A
Note: N/A means Not applicable.						

3.2.Block Diagram of Test Setup



:50Ω Terminator

3.3.Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limits shall apply at the transition frequencies.
3. Emission Level (dBμV) = Factor (L.I.S.N.) (dB) + Cable Loss (dB)+Reading (Receiver) (dBμV)

3.4.Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1. TrapMan (EUT)

Model No. : TM8
Serial No. : N/A

3.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.3.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT as shown as Section 3.2.

3.5.2. Turn on the power of EUT.

3.5.3. PC run test software to control EUT work in Tx mode.

3.6. Test Procedure

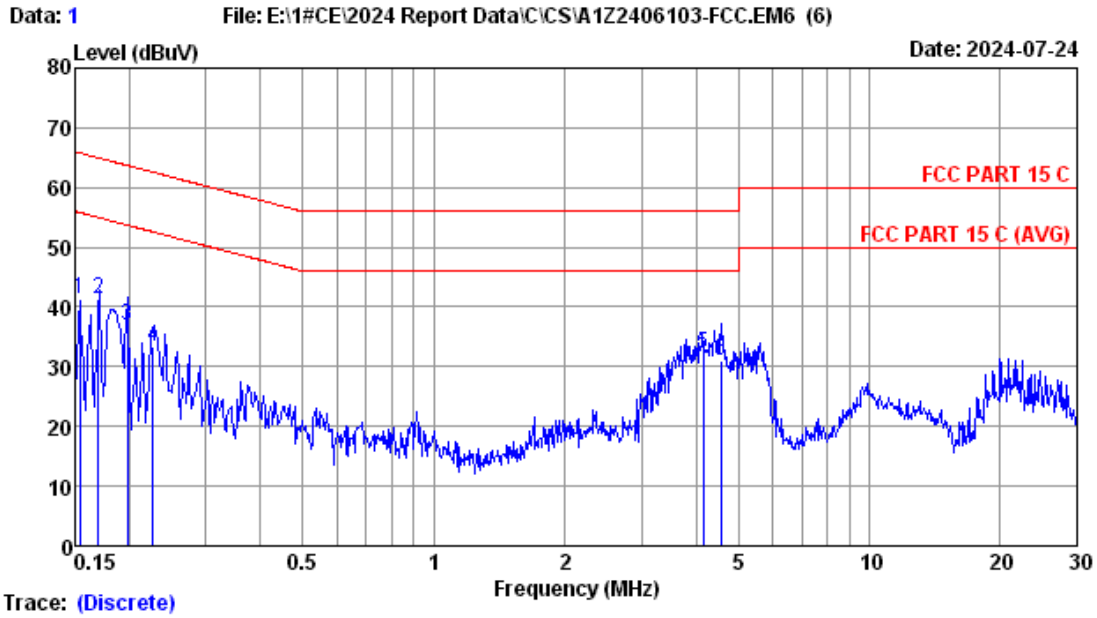
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via Adapter connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.7. Power Line Conducted Emission Test Results

PASS. **(**All emissions not reported below are too low against the prescribed limits.)

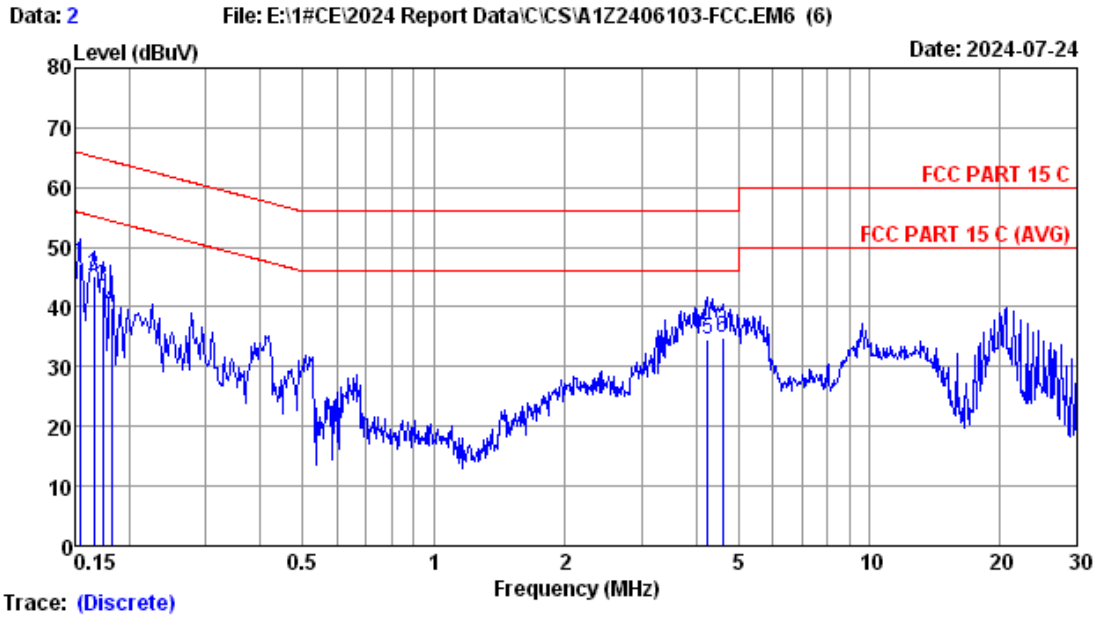


Trace: (Discrete)

Site no :1# CE
Data No :1
Dis./Lisn :2024 ENV216-L
Limit :FCC PART 15 C
Env./Ins. :24.6*C/57%
Engineer :Hongjie
Power Rating :AC 120V/60Hz
Test Mode :BT3.0 BDR TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.154	9.77	0.01	31.64	41.42	65.78	24.36	QP
2	0.170	9.77	0.01	31.55	41.33	64.96	23.63	QP
3	0.198	9.76	0.01	27.10	36.87	63.69	26.82	QP
4	0.226	9.76	0.01	23.53	33.30	62.60	29.30	QP
5	4.154	9.81	0.05	22.26	32.12	56.00	23.88	QP
6	4.562	9.81	0.06	21.02	30.89	56.00	25.11	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

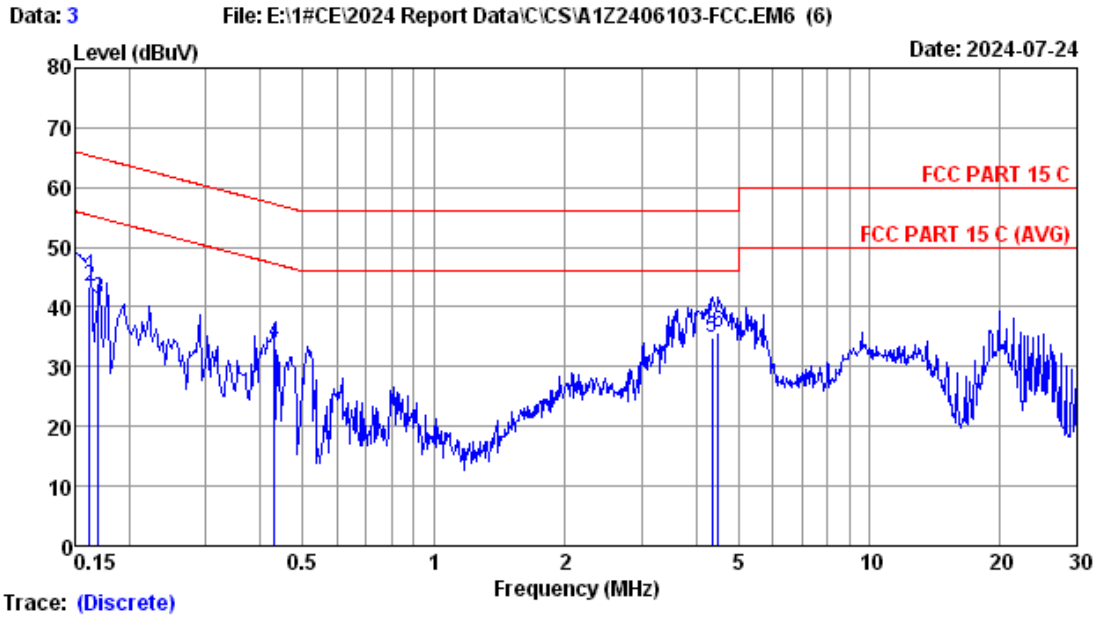


Trace: (Discrete)

Site no :1# CE
Data No :2
Dis./Lisn :2024 ENV216-N
Limit :FCC PART 15 C
Env./Ins. :24.6*C/57%
Engineer :Hongjie
Power Rating :AC 120V/60Hz
Test Mode :BT3.0 BDR TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.154	9.76	0.01	37.56	47.33	65.78	18.45	QP
2	0.166	9.77	0.01	35.53	45.31	65.16	19.85	QP
3	0.174	9.77	0.01	33.71	43.49	64.77	21.28	QP
4	0.182	9.77	0.01	30.19	39.97	64.39	24.42	QP
5	4.250	9.82	0.05	24.81	34.68	56.00	21.32	QP
6	4.614	9.83	0.06	25.06	34.95	56.00	21.05	QP

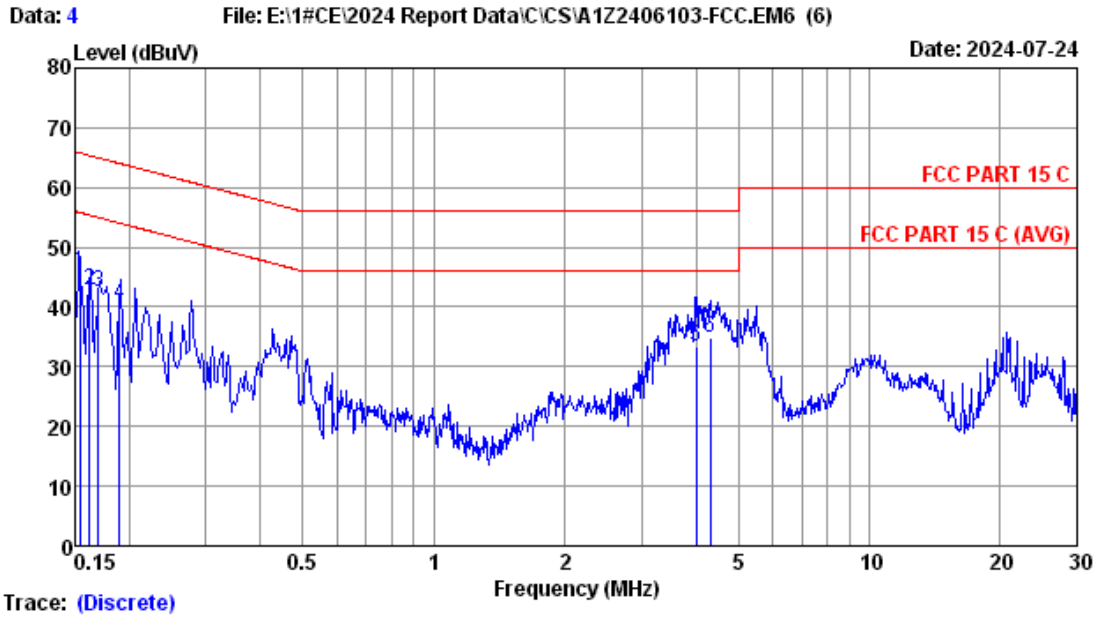
Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



Site no :1# CE
Data No :3
Dis./Lisn :2024 ENV216-N
Limit :FCC PART 15 C
Env./Ins. :24.6*C/57%
Engineer :Hongjie
Power Rating :AC 120V/60Hz
Test Mode :BT3.0 EDR TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.150	9.76	0.01	37.20	46.97	66.00	19.03	QP
2	0.162	9.76	0.01	33.68	43.45	65.36	21.91	QP
3	0.170	9.77	0.01	31.59	41.37	64.96	23.59	QP
4	0.430	9.78	0.02	24.13	33.93	57.25	23.32	QP
5	4.354	9.82	0.06	24.90	34.78	56.00	21.22	QP
6	4.494	9.82	0.06	25.82	35.70	56.00	20.30	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



Site no :1# CE
Data No :4
Dis./Lisn :2024 ENV216-L
Limit :FCC PART 15 C
Env./Ins. :24.6*C/57%
Engineer :Hongjie
Power Rating :AC 120V/60Hz
Test Mode :BT3.0 EDR TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.154	9.77	0.01	36.06	45.84	65.78	19.94	QP
2	0.162	9.77	0.01	33.16	42.94	65.36	22.42	QP
3	0.170	9.77	0.01	32.75	42.53	64.96	22.43	QP
4	0.190	9.76	0.01	30.81	40.58	64.04	23.46	QP
5	4.006	9.81	0.05	23.54	33.40	56.00	22.60	QP
6	4.314	9.81	0.06	25.10	34.97	56.00	21.03	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

4. RADIATED EMISSION TEST

4.1.Test Equipments

Frequency range: 30~1000MHz

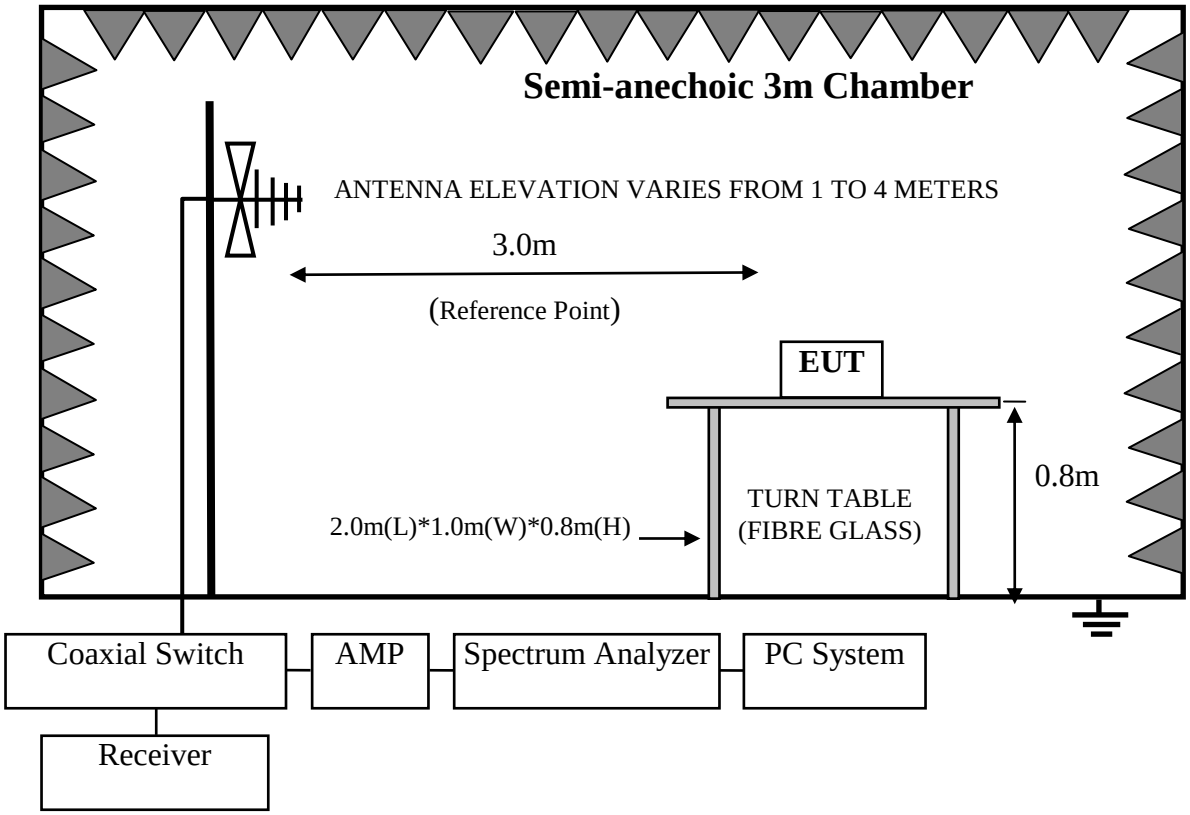
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3m Chamber(NSA)	AUDIX	N/A	N/A	Aug.11,22	3Year
2.	3m Chamber(SE)	AUDIX	N/A	N/A	Sep.16,22	3 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV40	101608	Nov.07,23	1 Year
4.	Tri-log-Broadband Antenna	SCHWARZBECK	VULB 9168	429	Oct.10,23	1 Year
5.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year
6.	Coaxial Switch	Anritsu	MP59B	6201397223	Mar.17,24	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESR3	101931	Mar.17,24	1 Year
8.	Amplifier	HP	8447D	2944A11159	Mar.17,24	1 Year
9.	Test Software	AUDIX	e3	6.100913a	N/A	N/A
Note: N/A means Not applicable.						

Frequency range: above 1000MHz

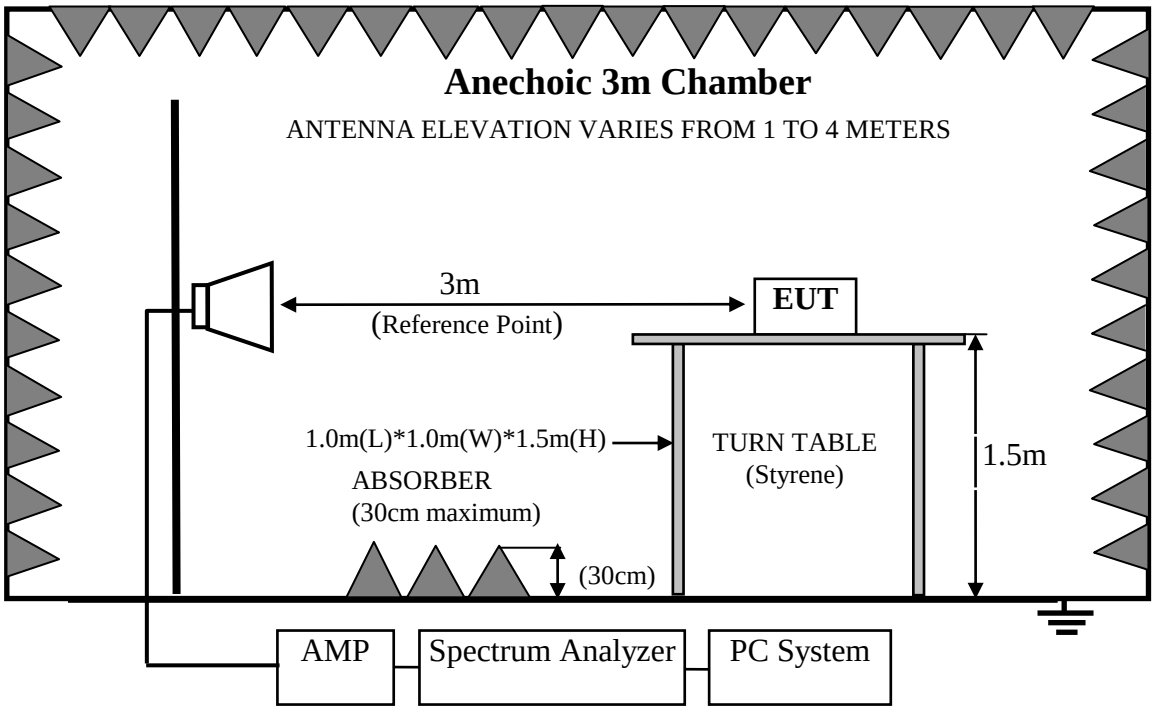
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3mChamber(Svswr)	AUDIX	N/A	N/A	Aug.09,22	3Year
2.	3mChamber(SE)	AUDIX	N/A	N/A	Sep.16,22	3Year
3.	Signal Analyzer	Rohde & Schwarz	FSV40	101608	Nov.07,23	1 Year
4.	Amplifier	Agilent	83017A	MY53270084	Sep.20,23	1 Year
5.	RF Cable	TIMES MICROWAVE	SFT205-NMSM-10.00M	689241	Aug.25,23	1 Year
6.	Test Software	AUDIX	e3	6.100913a	N/A	N/A
7.	Horn Antenna	ETC	MCTD 1209	DRH15F03006	Aug.23,23	1 Year
Note: N/A means Not applicable.						

4.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range above 1GHz



4.3.Radiated Emission Limits Standard:

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark : (1) Emission Level (dBμV/m) = Reading (Receiver) (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB)
Emission Level (dBμV/m) = Reading (Spectrum) (dBμV) + Antenna Factor (dB/m) – Amp Factor (dB) + Cable Loss (dB)(above 1000MHz)

(2) The smaller limits shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.4.1. TrapMan (EUT)

Model Number : TM8
Serial Number : N/A

4.5.Operating Condition of EUT

4.5.1. Setup the EUT and simulator as shown as Section 4.2.

4.5.2. Turn on the power of all equipments.

4.5.3. Let EUT work in Tx mode.

4.6. Test Procedure

Frequency below 30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 regulation.

Frequency Above 30MHz:

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)*2.4m(W)*0.3m(H) on the ground . The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it.EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horm antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10 on radiated emission Test

The bandwidth of the EMI test receiver (R&S ESR3) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse Modulated, a duty cycle factor was used to calculated average level based measured peak level.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7. Radiated Emission Test Results

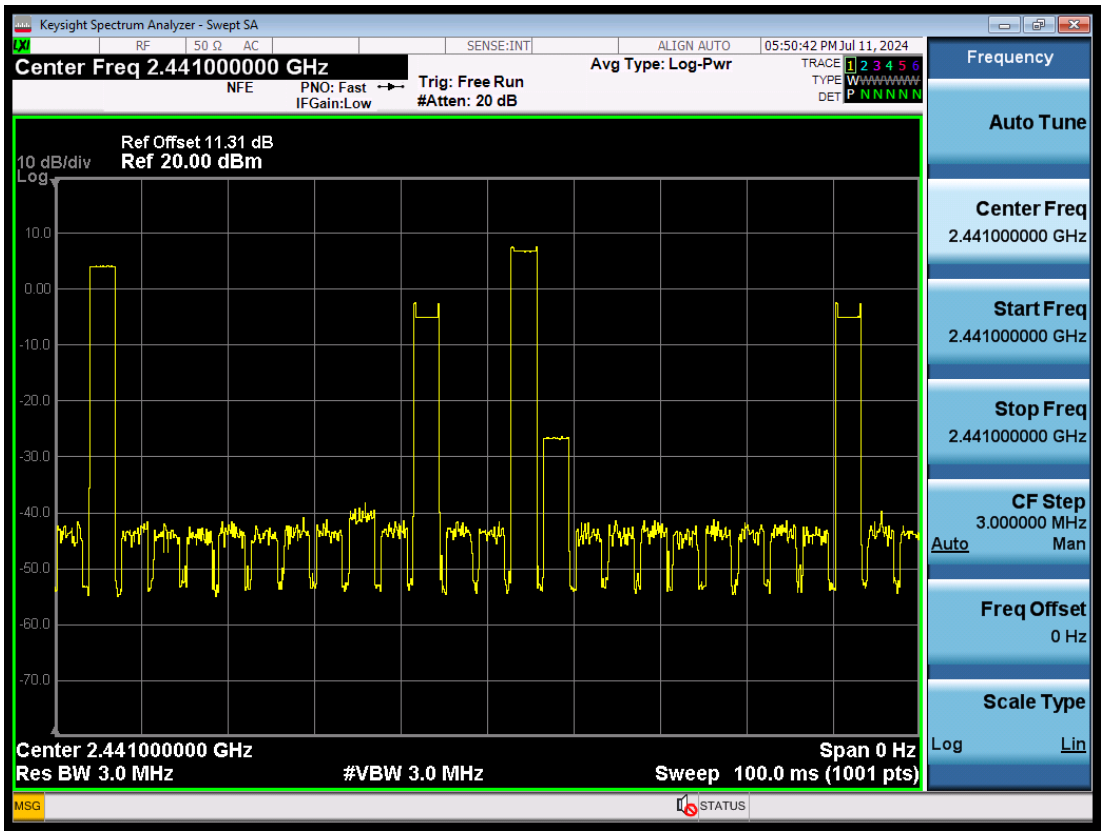
PASS.

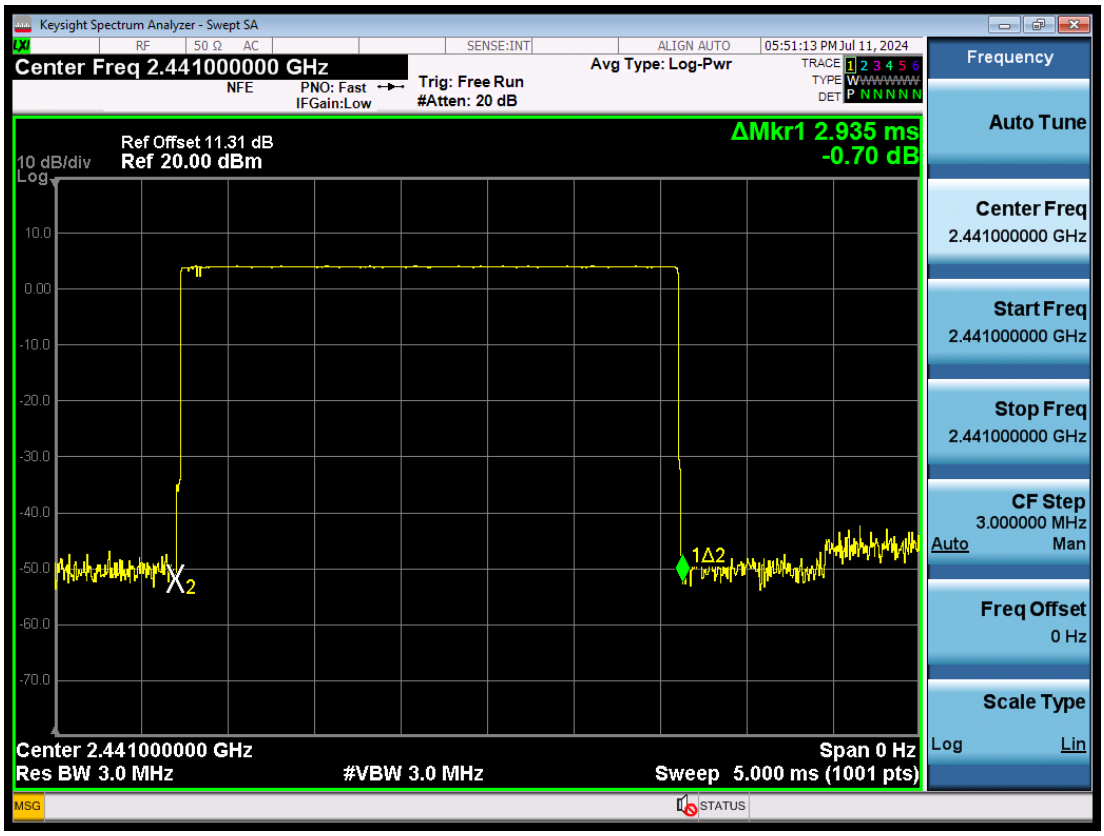
All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note 1: The duty cycle factor for calculate average level is -30.648dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

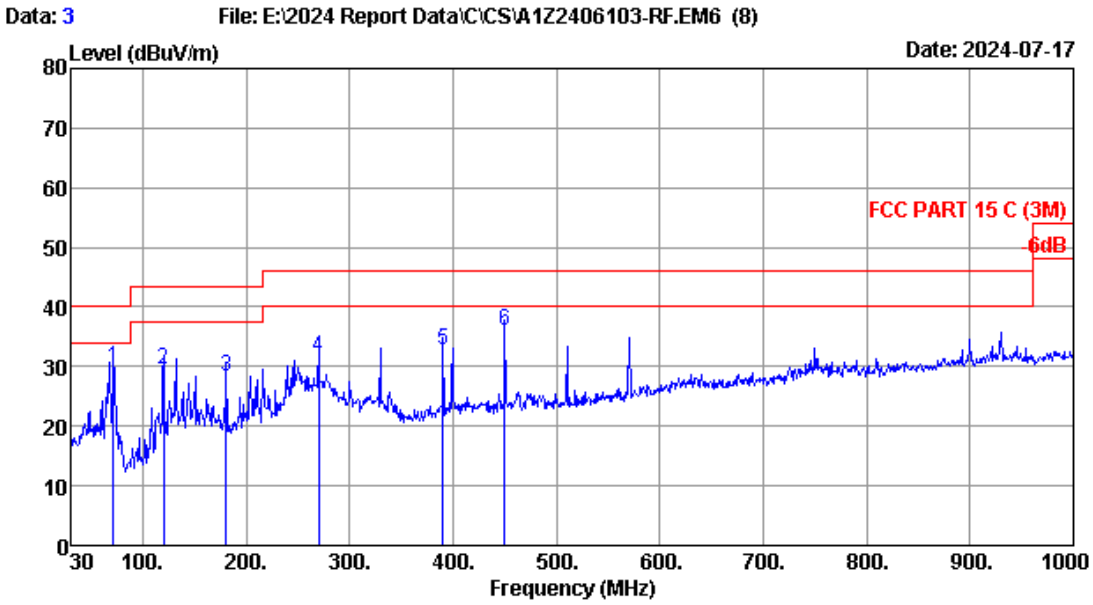
Note 2: The emissions (9kHz~30MHz) not reported for there is no emission be found.

Duty cycle factor = 20log(Dwell time/100ms)= -30.648dB
Dwell Time = 2.935*1ms





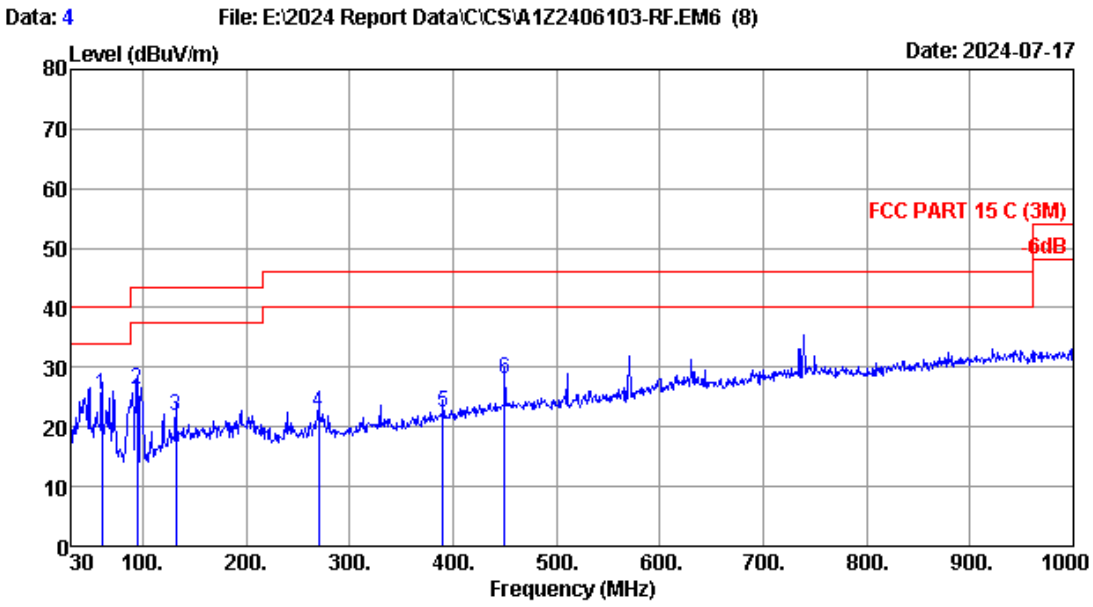
Frequency: 30MHz~1GHz



Site no. : 3m Chamber Data no. : 3
Dis. / Ant. : 3m 2023 VULB 9168-429 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/53% Engineer : Abel
EUT :
Power rating :
Test Mode : BT 3.0 BDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	71.710	17.26	0.75	11.66	29.67	40.00	10.33	QP
2	120.210	17.32	0.93	11.40	29.65	43.50	13.85	QP
3	180.350	17.86	1.10	9.36	28.32	43.50	15.18	QP
4	269.590	18.58	1.36	11.72	31.66	46.00	14.34	QP
5	389.870	21.40	1.61	9.82	32.83	46.00	13.17	QP
6	450.010	23.20	1.73	10.97	35.90	46.00	10.10	QP

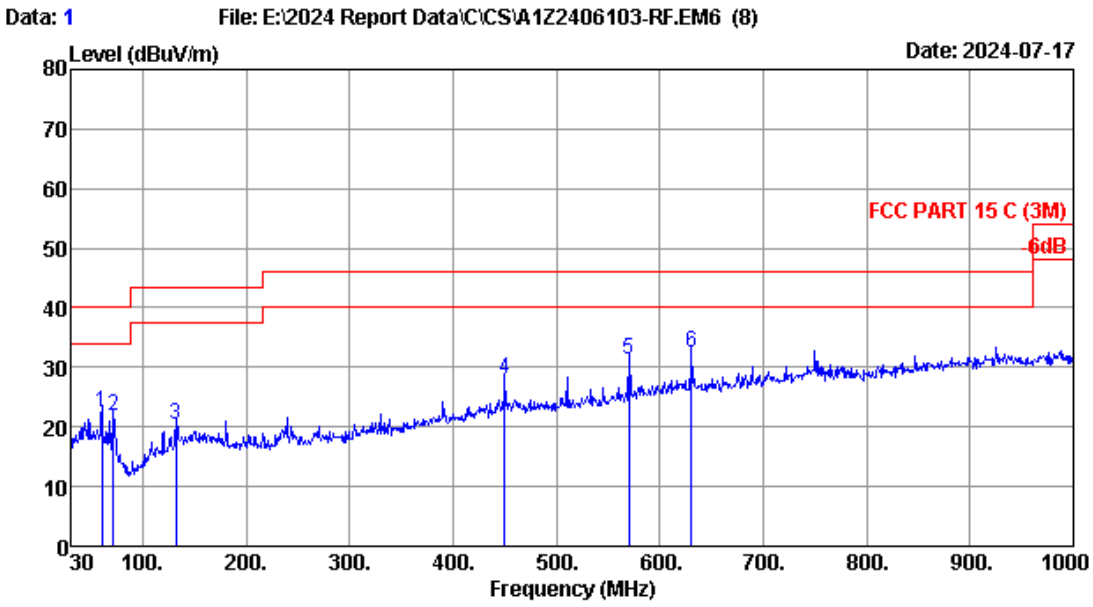
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2023 VULB 9168-429 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/53% Engineer : Abel
EUT :
Power rating :
Test Mode : BT 3.0 BDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	60.070	19.29	0.69	5.50	25.48	40.00	14.52	QP
2	94.020	14.40	0.84	10.91	26.15	43.50	17.35	QP
3	131.850	18.39	0.96	2.48	21.83	43.50	21.67	QP
4	269.590	18.58	1.36	2.38	22.32	46.00	23.68	QP
5	389.870	21.40	1.61	-0.60	22.41	46.00	23.59	QP
6	450.010	23.20	1.73	3.19	28.12	46.00	17.88	QP

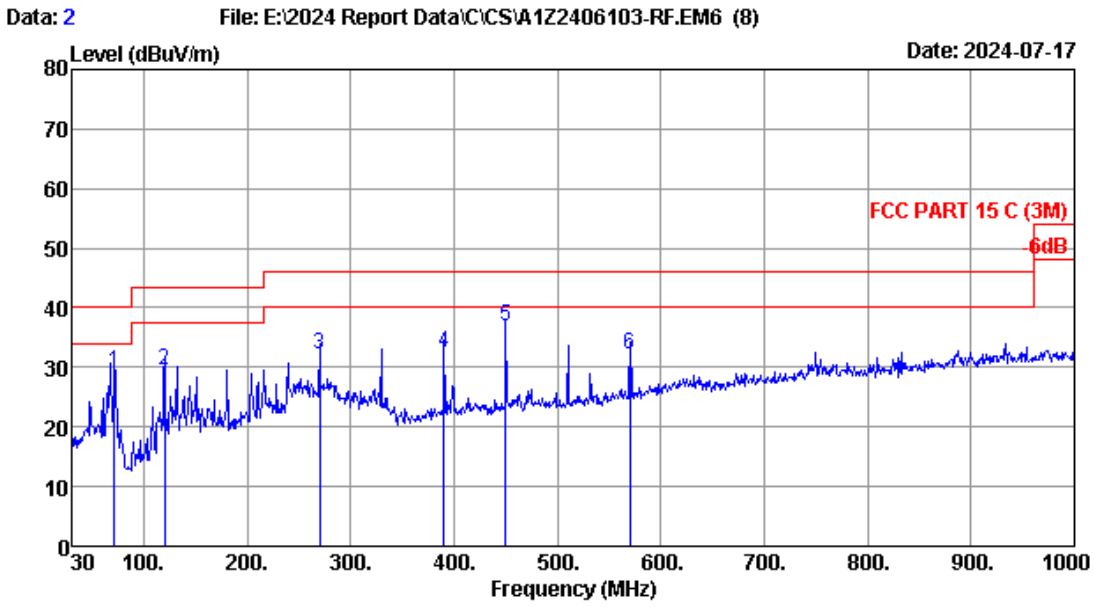
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2023 VULB 9168-429 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/53% Engineer : Abel
EUT :
Power rating :
Test Mode : BT 3.0 EDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	60.070	19.29	0.69	2.52	22.50	40.00	17.50	QP
2	71.710	17.26	0.75	3.84	21.85	40.00	18.15	QP
3	131.850	18.39	0.96	1.05	20.40	43.50	23.10	QP
4	450.010	23.20	1.73	3.09	28.02	46.00	17.98	QP
5	570.290	24.71	1.98	4.69	31.38	46.00	14.62	QP
6	630.430	26.22	2.12	4.00	32.34	46.00	13.66	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

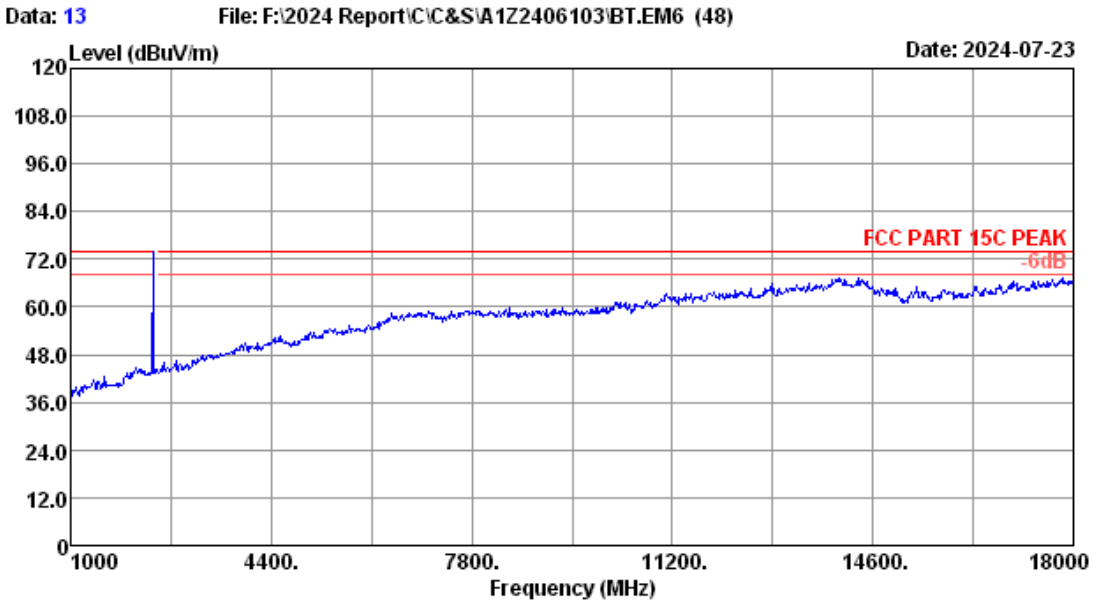


Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2023 VULB 9168-429 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/53% Engineer : Abel
EUT :
Power rating :
Test Mode : BT 3.0 EDR TX Mode

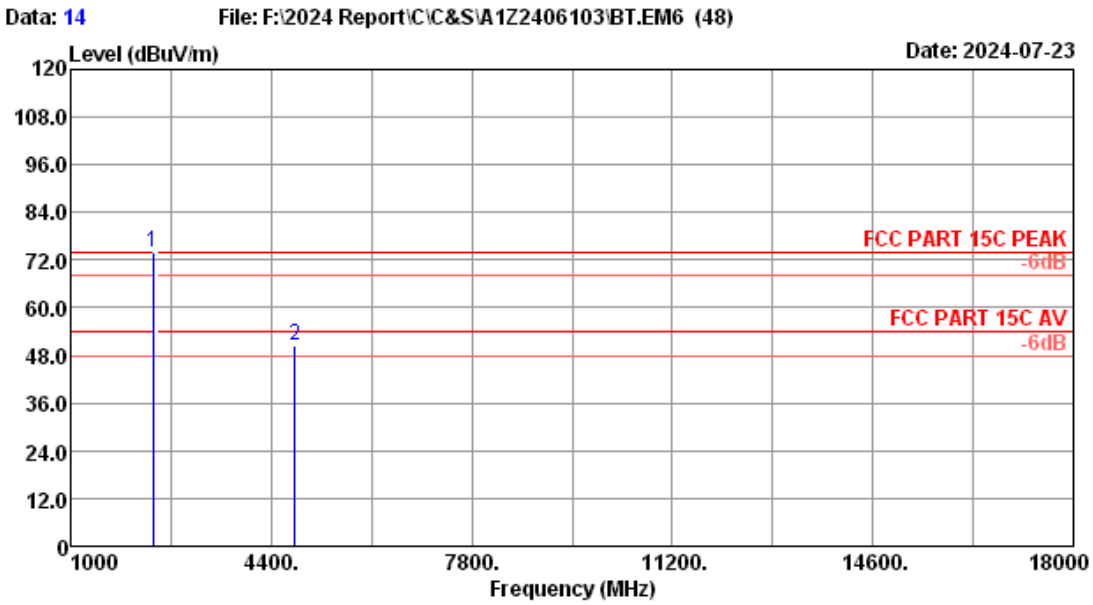
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	71.710	17.26	0.75	11.32	29.33	40.00	10.67	QP
2	120.210	17.32	0.93	11.15	29.40	43.50	14.10	QP
3	269.590	18.58	1.36	12.12	32.06	46.00	13.94	QP
4	389.870	21.40	1.61	9.44	32.45	46.00	13.55	QP
5	450.010	23.20	1.73	11.90	36.83	46.00	9.17	QP
6	570.290	24.71	1.98	5.59	32.28	46.00	13.72	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~18GHz



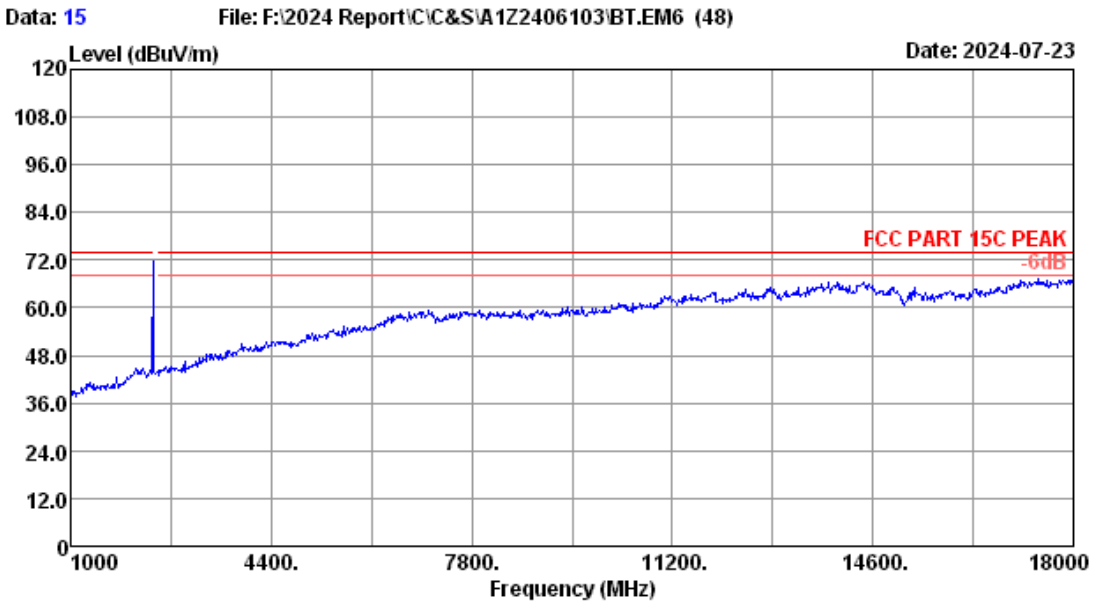
Site no.	: 3m Chamber	Data no.	: 13
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 GFSK 2402 MHz TX Mode		



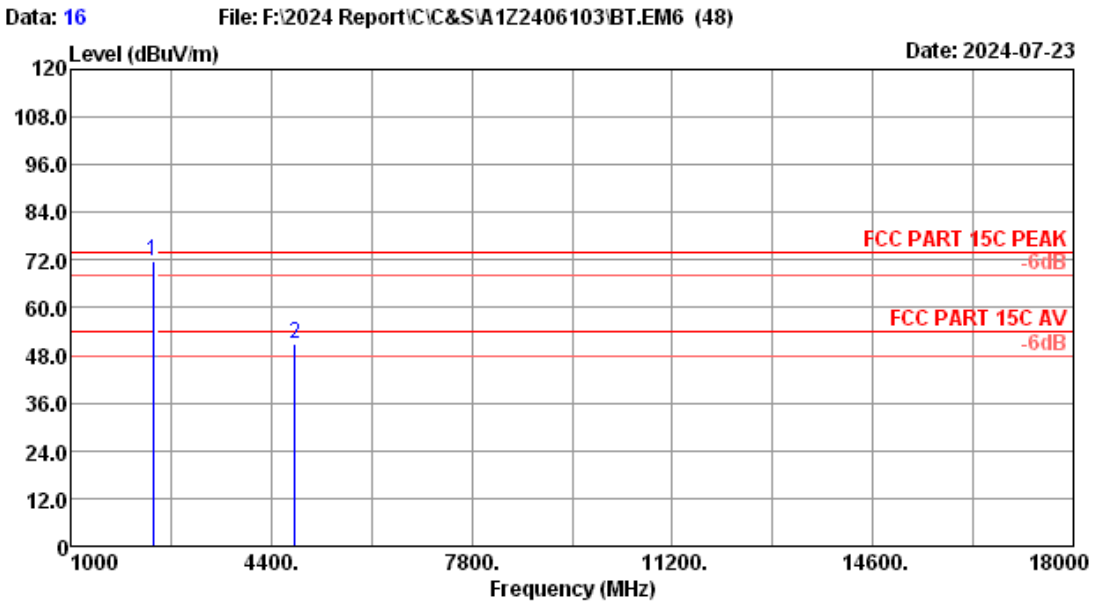
Site no. : 3m Chamber
Data no. : 14
Dis. / Ant. : 3m 2023 MCTD1209-3006
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6%
Engineer : Epoch
Test Mode : BT3.0 GFSK 2402 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	5.32	72.57	31.70	73.80	------	------	Peak
2	4804.00	31.20	7.41	42.20	30.42	50.39	74.00	23.61	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



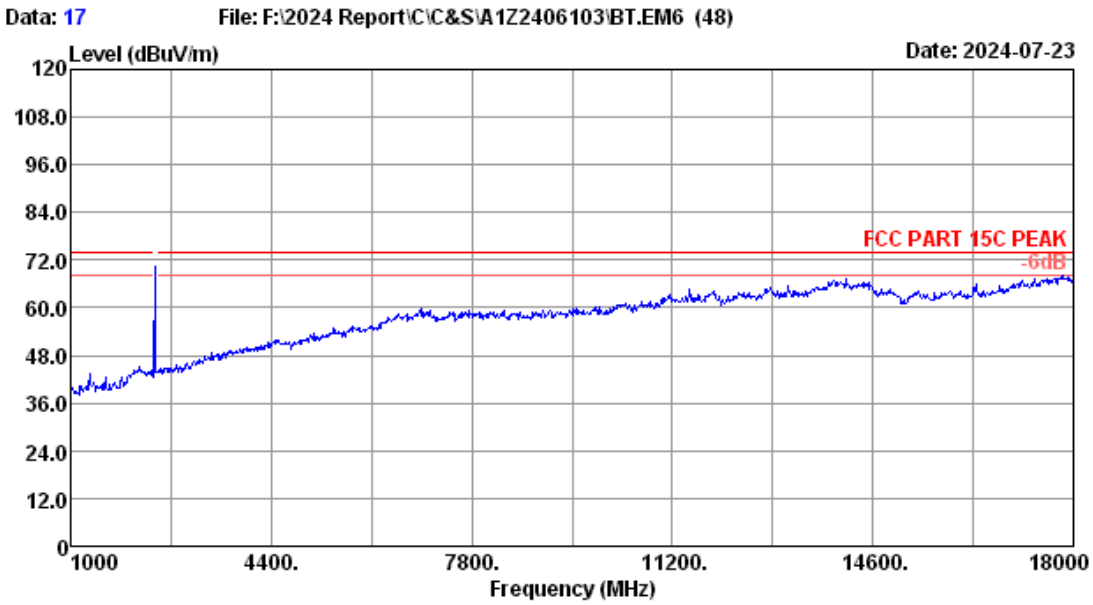
Site no.	: 3m Chamber	Data no.	: 15
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 GFSK 2402 MHz TX Mode		



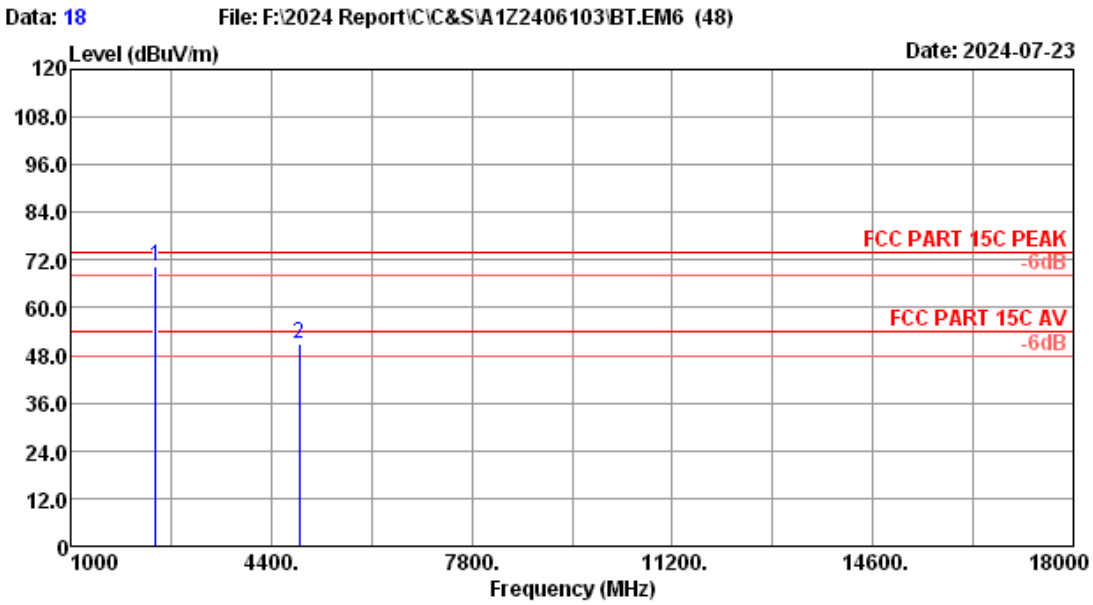
Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 GFSK 2402 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	5.32	70.39	31.70	71.62	------	------	Peak
2	4804.00	31.20	7.41	42.59	30.42	50.78	74.00	23.22	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



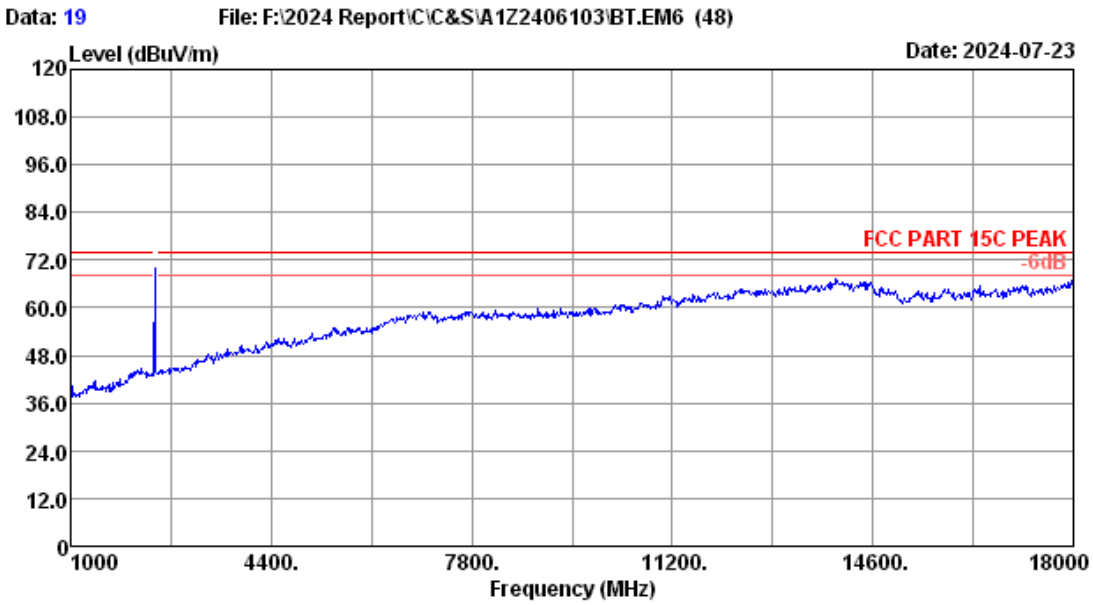
Site no. : 3m Chamber
Data no. : 17
Dis. / Ant. : 3m 2023 MCTD1209-3006
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6%
Engineer : Epoch
Test Mode : BT3.0 GFSK 2441 MHz TX Mode



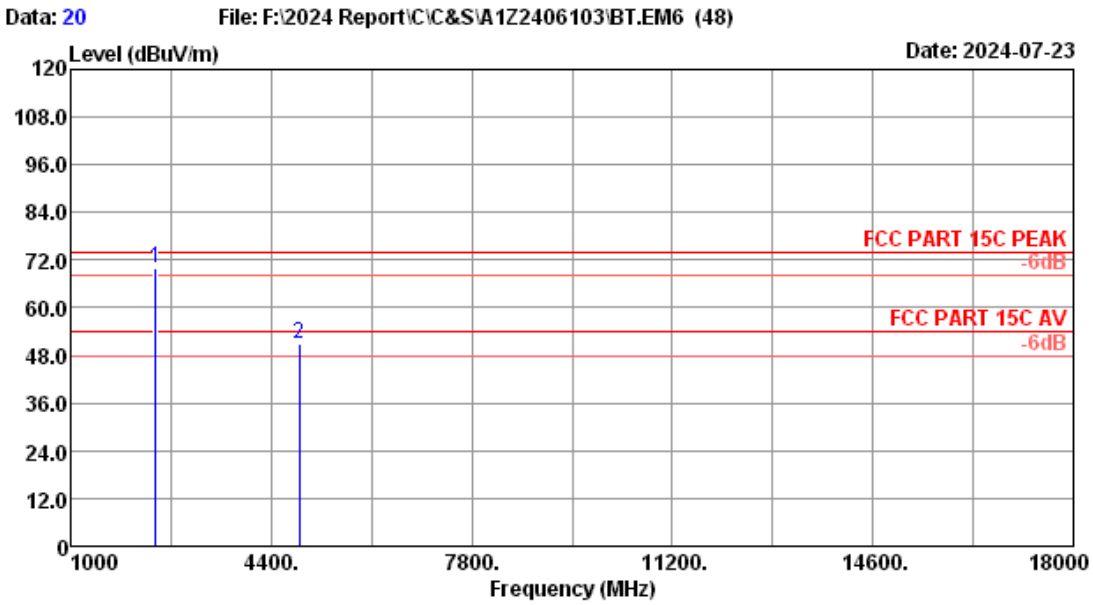
Site no. : 3m Chamber Data no. : 18
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 GFSK 2441 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.76	5.37	69.09	31.68	70.54	------	------	Peak
2	4882.00	31.46	7.45	42.63	30.41	51.13	74.00	22.87	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



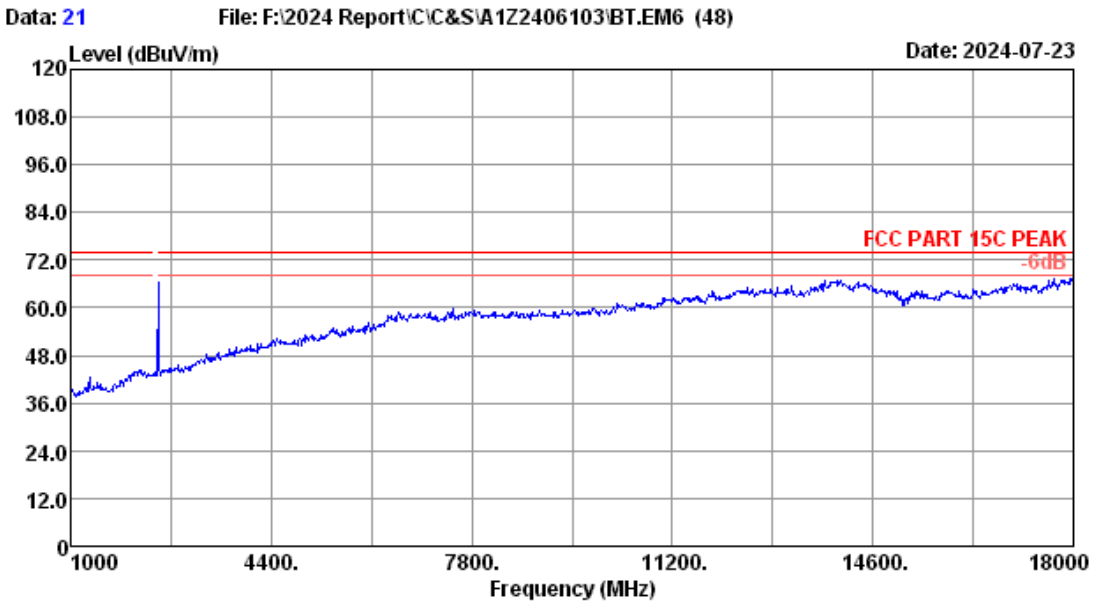
Site no.	: 3m Chamber	Data no.	: 19
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 GFSK 2441 MHz TX Mode		



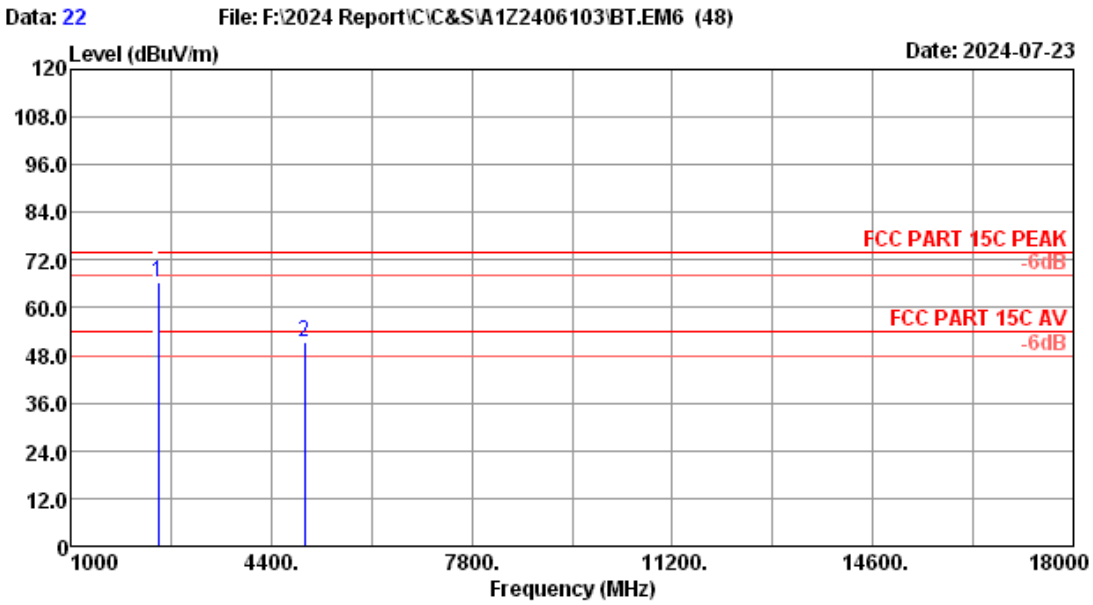
Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 GFSK 2441 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.76	5.37	68.71	31.68	70.16	------	------	Peak
2	4882.00	31.46	7.45	42.55	30.41	51.05	74.00	22.95	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



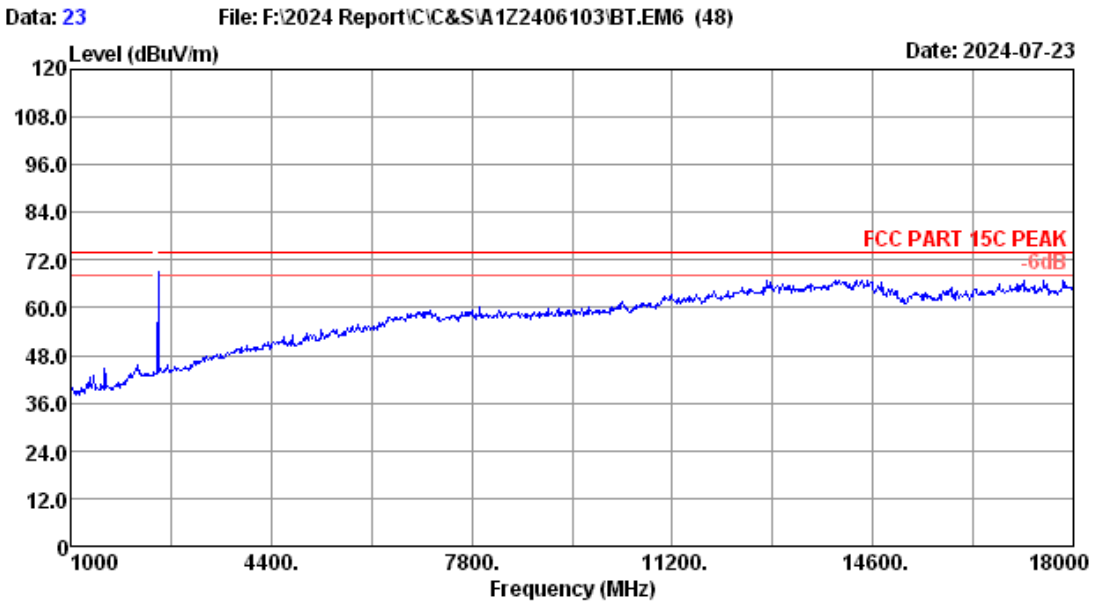
Site no.	: 3m Chamber	Data no.	: 21
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 GFSK 2480 MHz TX Mode		



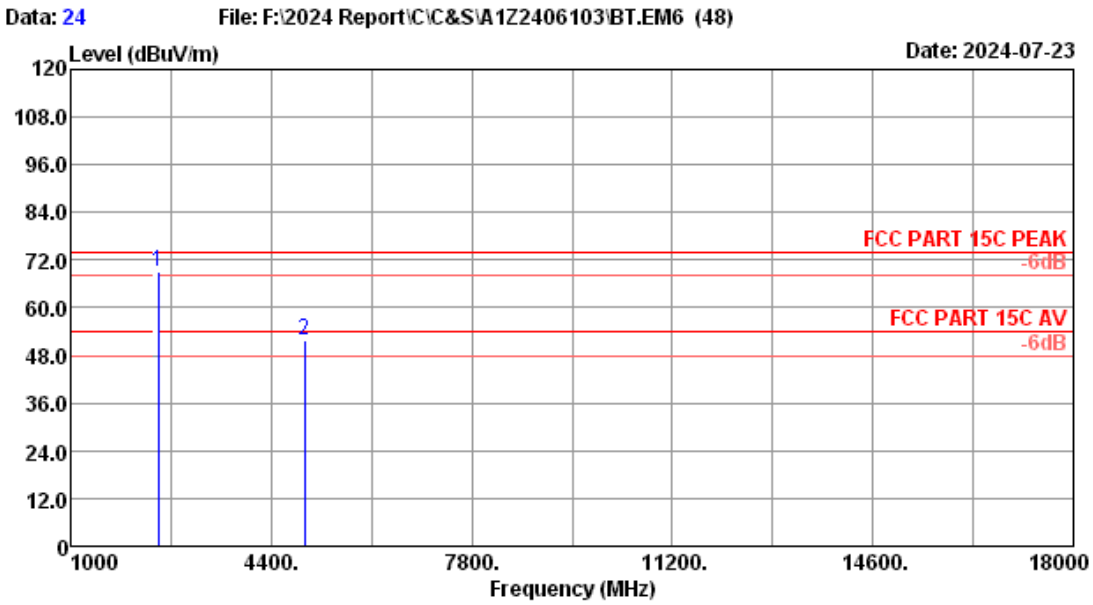
Site no. : 3m Chamber Data no. : 22
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 GFSK 2480 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.80	5.41	65.07	31.66	66.62	------	------	Peak
2	4960.00	31.98	7.50	42.29	30.40	51.37	74.00	22.63	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



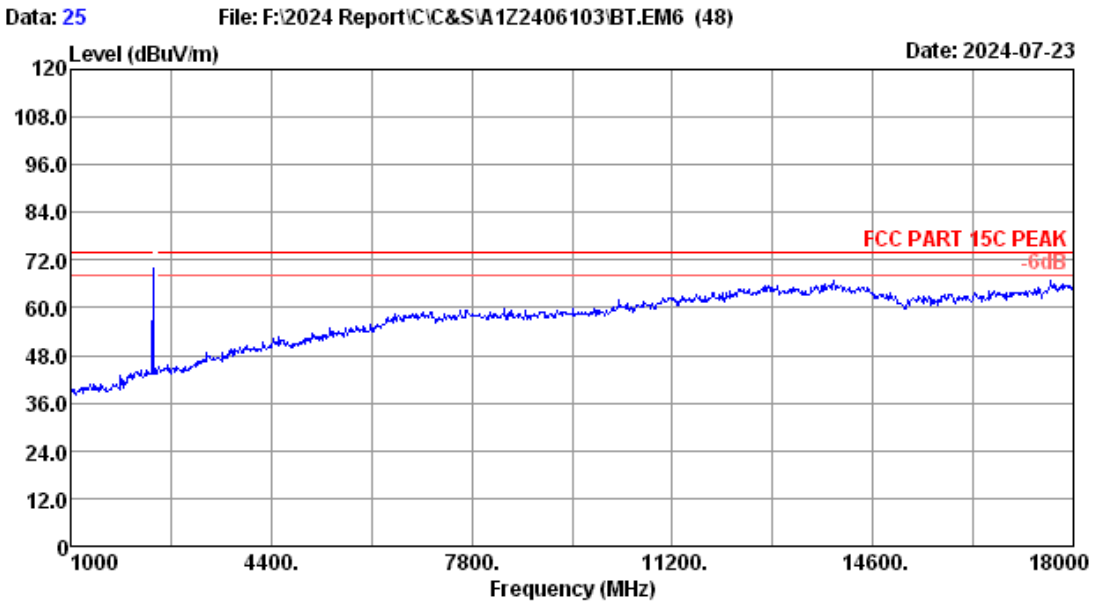
Site no.	: 3m Chamber	Data no.	: 23
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 GFSK 2480 MHz TX Mode		



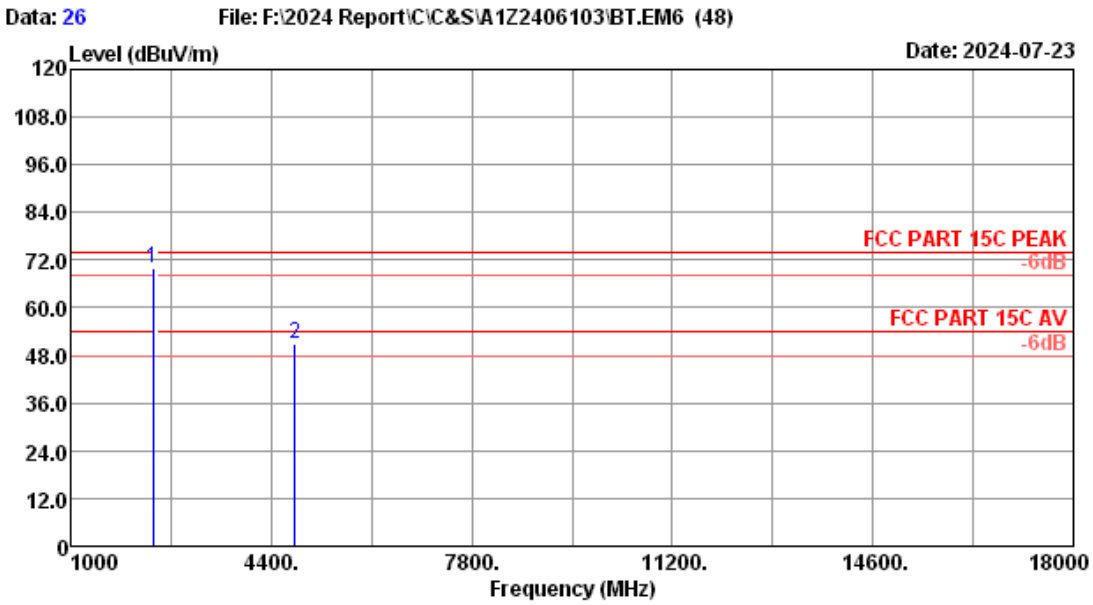
Site no. : 3m Chamber
Data no. : 24
Dis. / Ant. : 3m 2023 MCTD1209-3006
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6%
Engineer : Epoch
Test Mode : BT3.0 GFSK 2480 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.80	5.41	67.71	31.66	69.26	------	------	Peak
2	4960.00	31.98	7.50	42.70	30.40	51.78	74.00	22.22	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



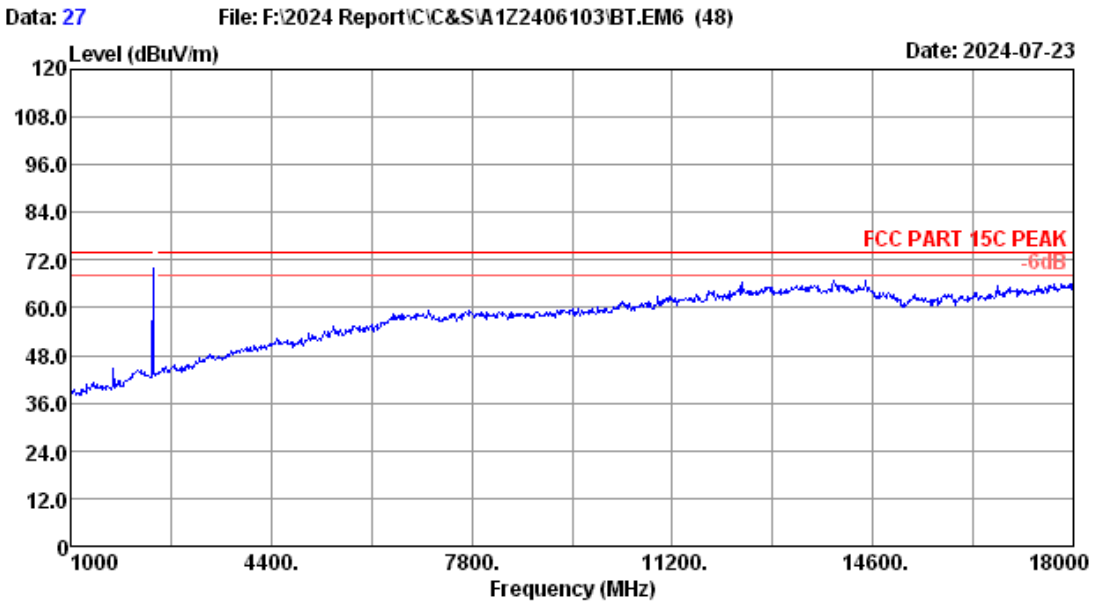
Site no.	: 3m Chamber	Data no.	: 25
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 8-DPSK 2402 MHz TX Mode		



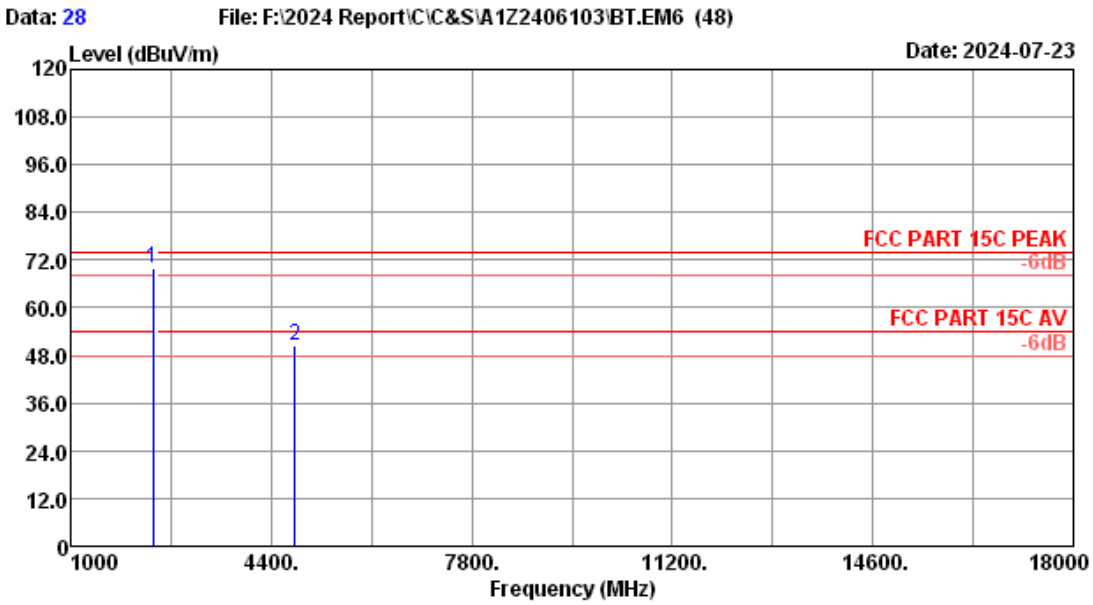
Site no. : 3m Chamber Data no. : 26
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2402 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	5.32	68.68	31.70	69.91	------	------	Peak
2	4804.00	31.20	7.41	42.55	30.42	50.74	74.00	23.26	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



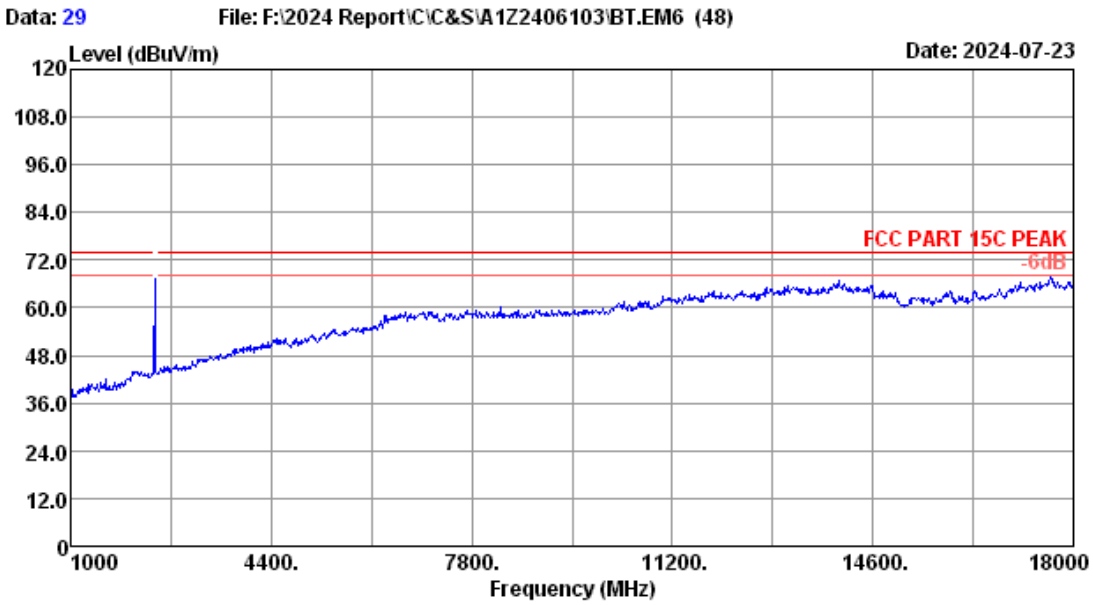
Site no.	: 3m Chamber	Data no.	: 27
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 8-DPSK 2402 MHz TX Mode		



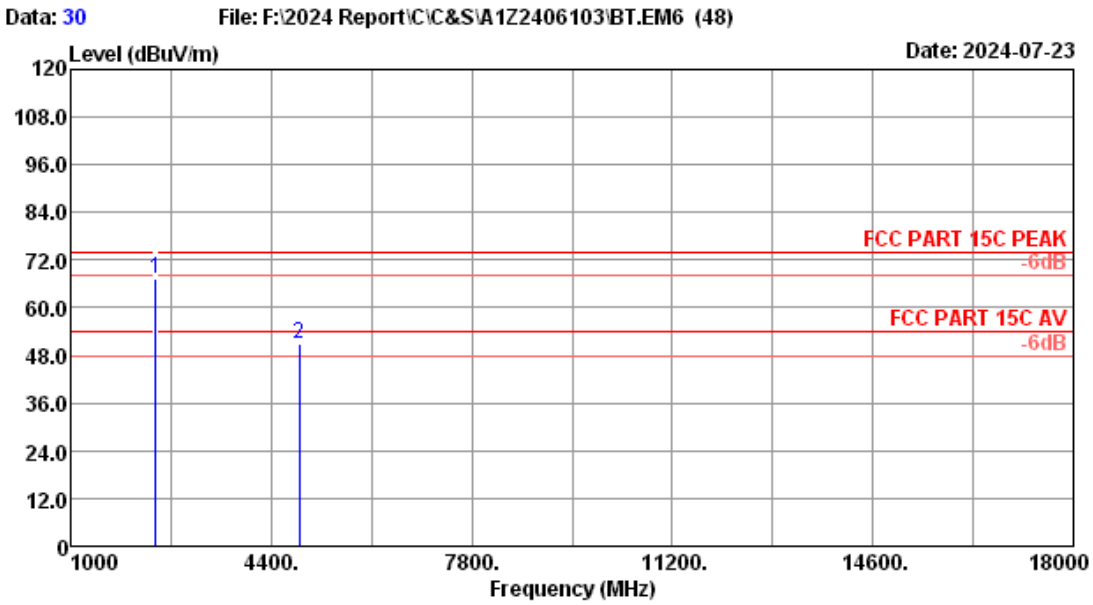
Site no. : 3m Chamber Data no. : 28
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2402 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	5.32	68.92	31.70	70.15	------	------	Peak
2	4804.00	31.20	7.41	42.30	30.42	50.49	74.00	23.51	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



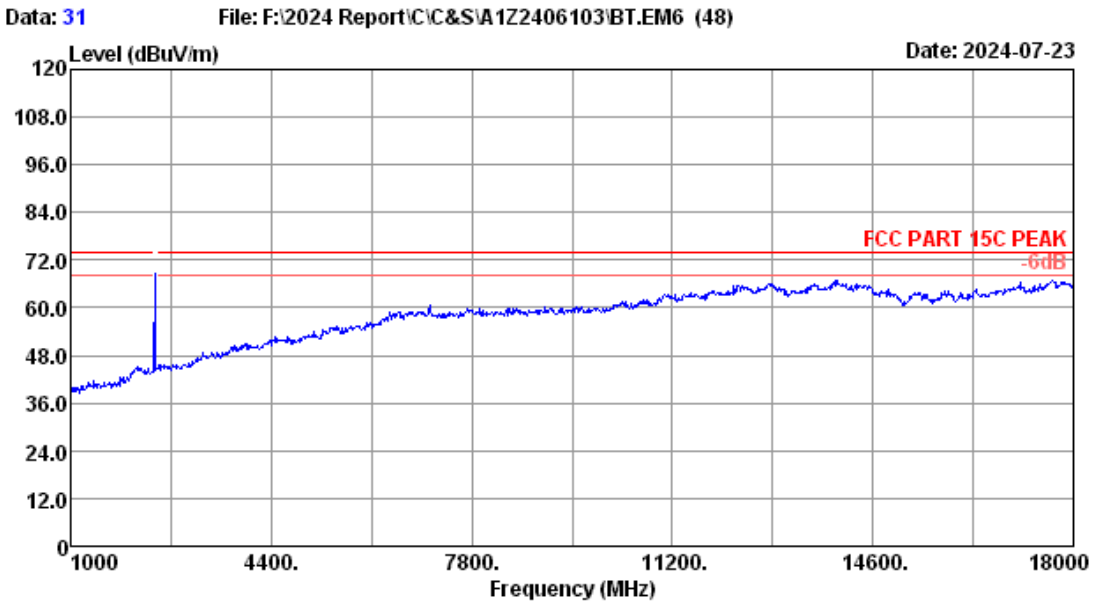
Site no.	: 3m Chamber	Data no.	: 29
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 8-DPSK 2441 MHz TX Mode		



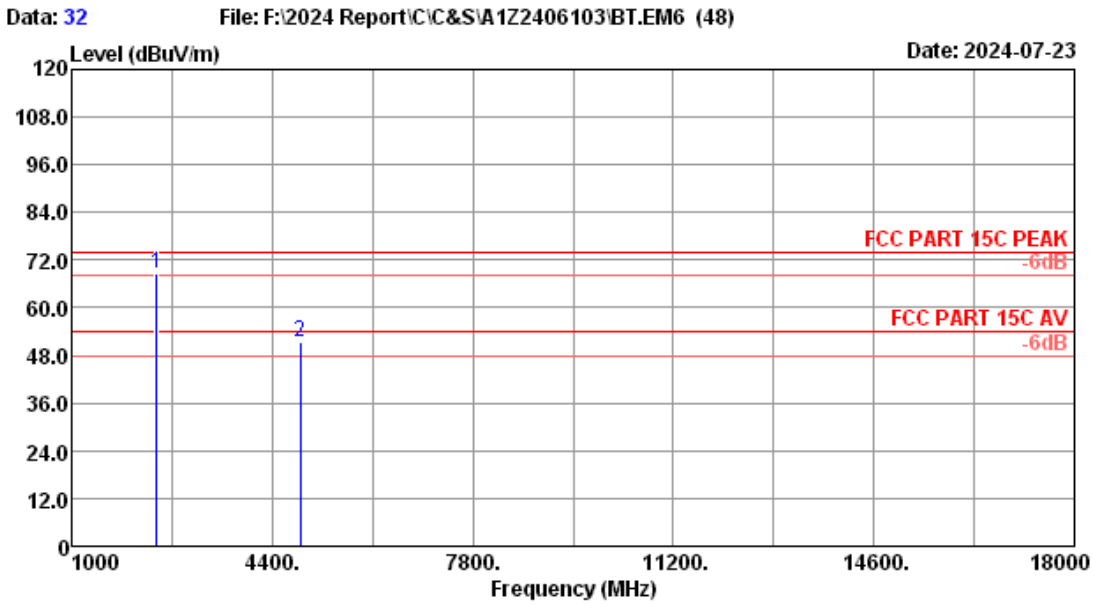
Site no. : 3m Chamber Data no. : 30
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2441 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.76	5.37	65.73	31.68	67.18	------	------	Peak
2	4882.00	31.46	7.45	42.48	30.41	50.98	74.00	23.02	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



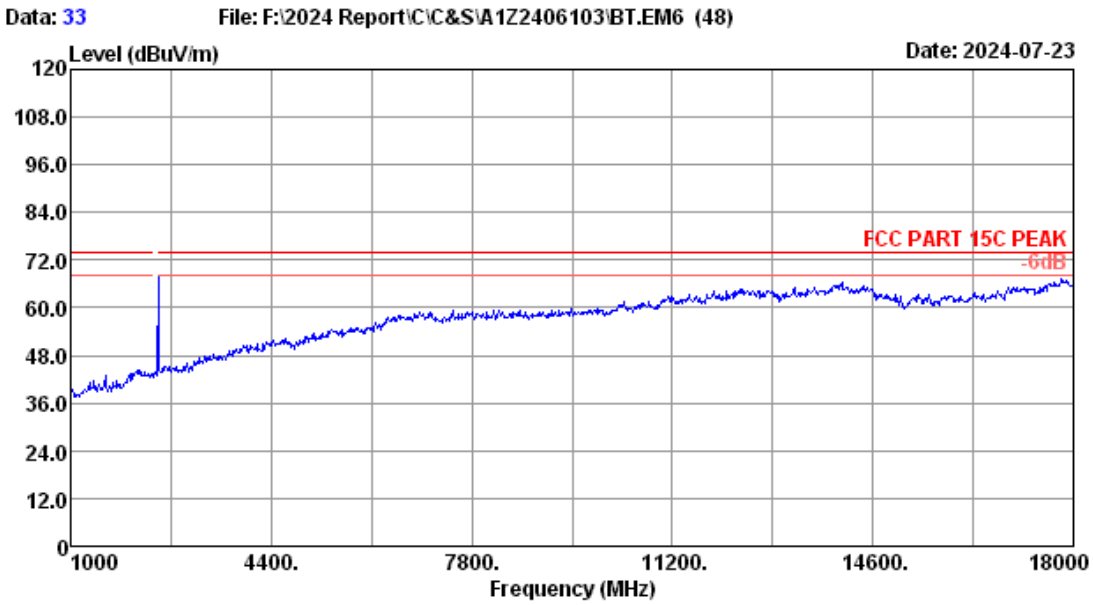
Site no.	: 3m Chamber	Data no.	: 31
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 8-DPSK 2441 MHz TX Mode		



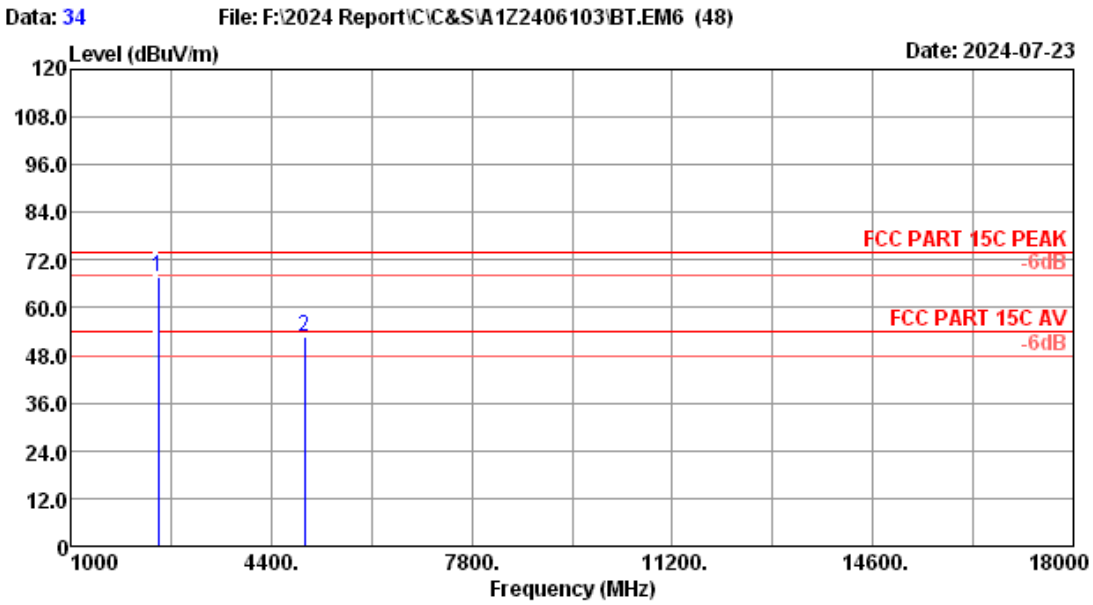
Site no. : 3m Chamber Data no. : 32
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2441 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.76	5.37	67.28	31.68	68.73	------	------	Peak
2	4882.00	31.46	7.45	42.93	30.41	51.43	74.00	22.57	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.



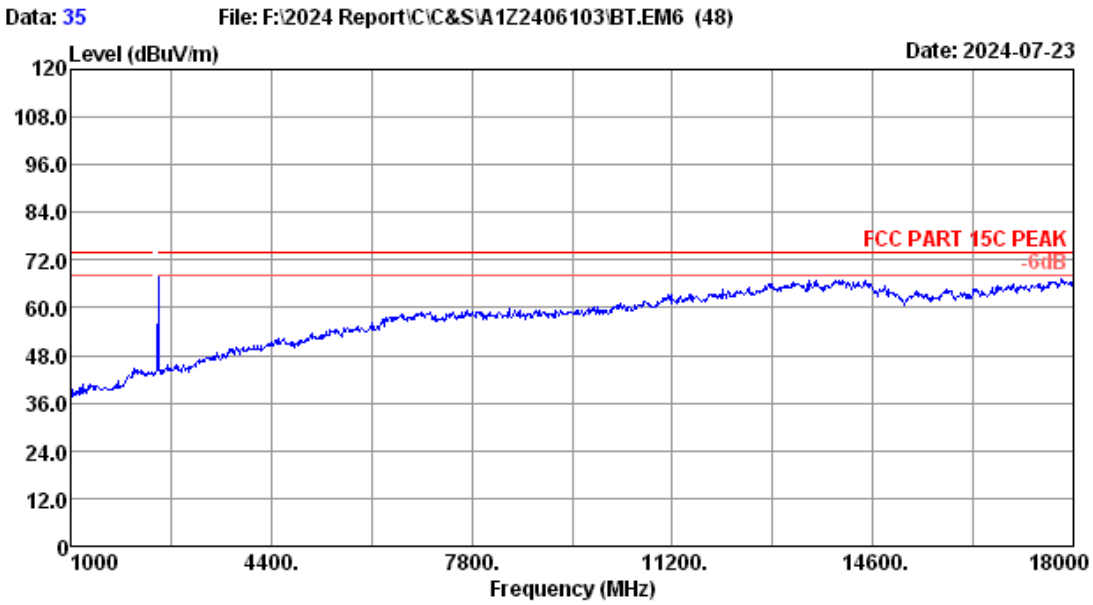
Site no. : 3m Chamber Data no. : 33
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2480 MHz TX Mode



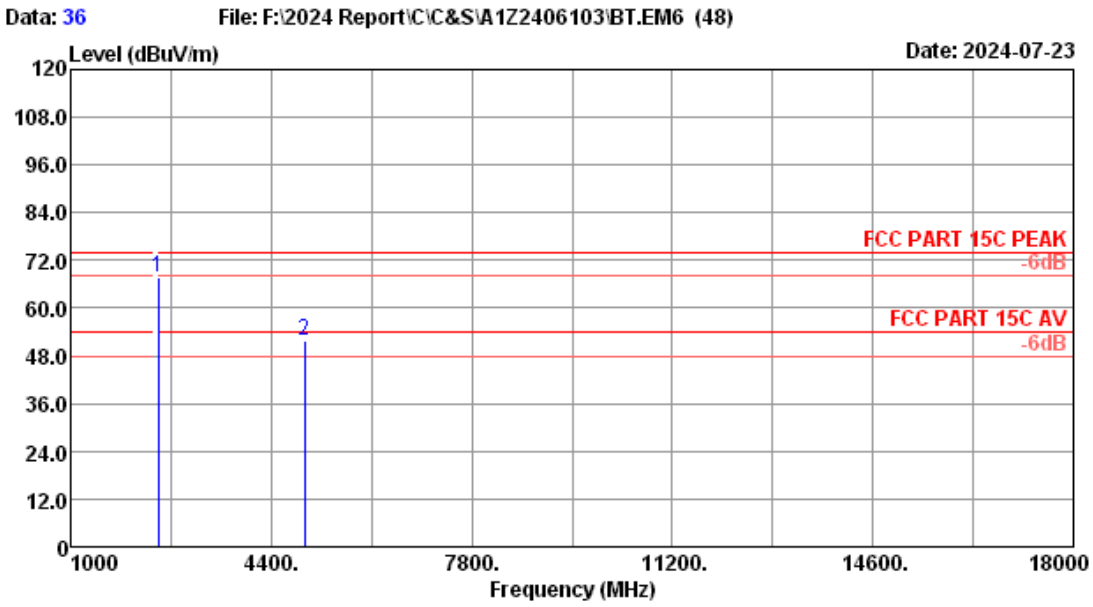
Site no. : 3m Chamber Data no. : 34
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2480 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.80	5.41	66.30	31.66	67.85	------	------	Peak
2	4960.00	31.98	7.50	43.74	30.40	52.82	74.00	21.18	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp factor.
2. The emission levels that are 20dB below the official
limit are not reported.



Site no.	: 3m Chamber	Data no.	: 35
Dis. / Ant.	: 3m 2023 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 20.7*C/55.6%	Engineer	: Epoch
Test Mode	: BT3.0 8-DPSK 2480 MHz TX Mode		



Site no. : 3m Chamber Data no. : 36
Dis. / Ant. : 3m 2023 MCTD1209-3006 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 20.7*C/55.6% Engineer : Epoch
Test Mode : BT3.0 8-DPSK 2480 MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.80	5.41	66.10	31.66	67.65	------	------	Peak
2	4960.00	31.98	7.50	42.74	30.40	51.82	74.00	22.18	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp factor.
2. The emission levels that are 20dB below the official limit are not reported.

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Mar.16,24	1Year
2.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year
3.	Attenuator(10dB)	eastsheep	2W-SMA-JK-6G-10dB	No. 4	Sep.19,23	1 Year

5.2.Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30dB instead of 20dB.

5.3.Test Procedure

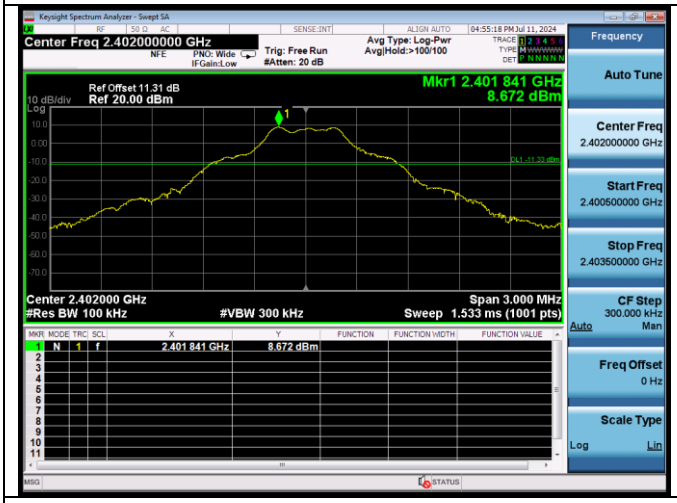
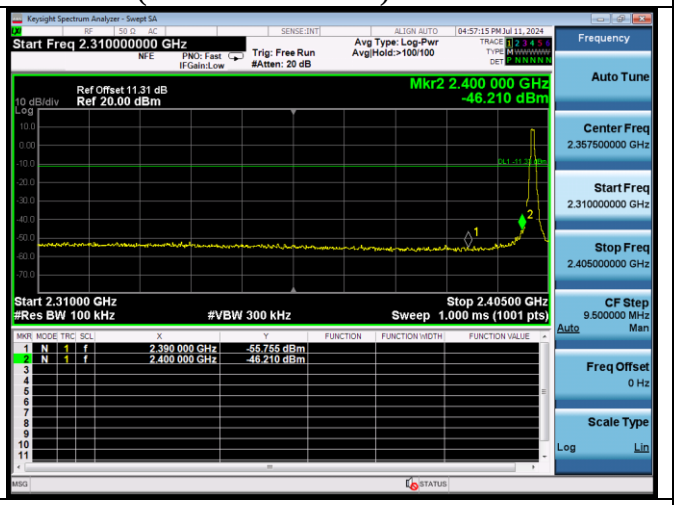
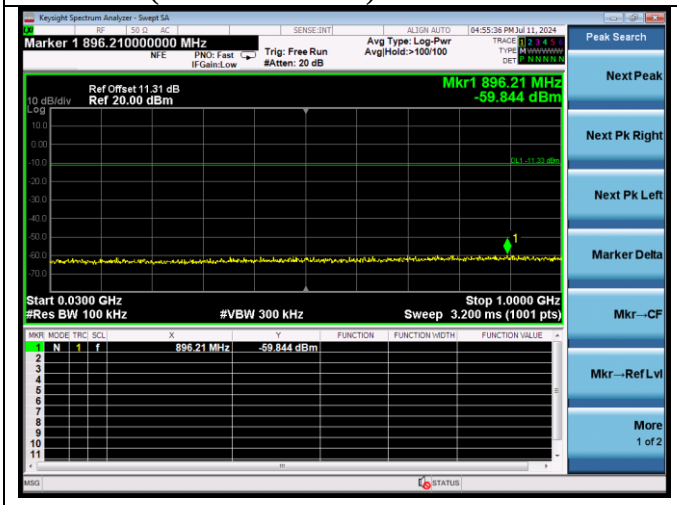
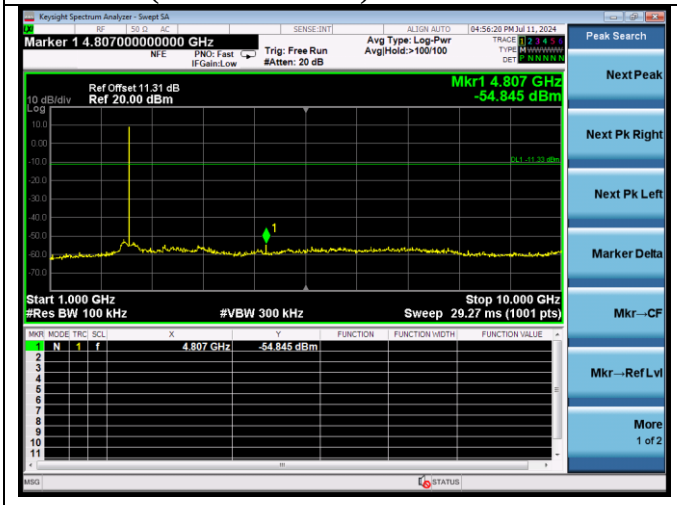
Use the test method descried in ANSI C63.10 clause 7.8.8:
The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions With peak detector.

Note: The cable loss and attenuator loss were offset into spectrum analyzer as an amplitude offset.

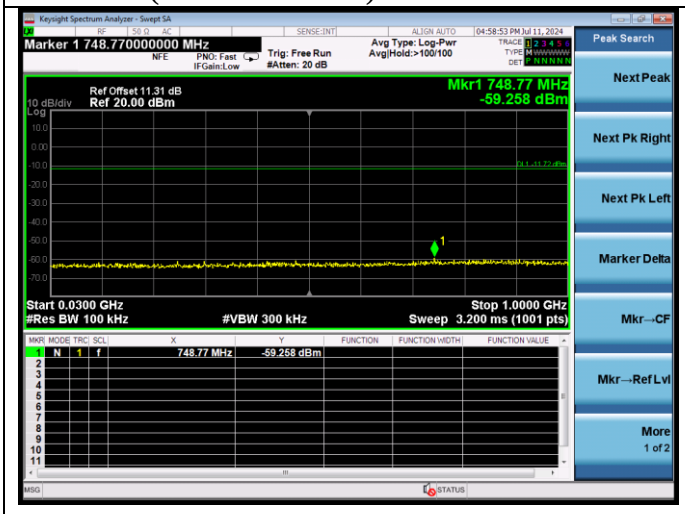
5.4.Test result

PASS (The testing data was attached in the next pages.)

EUT: TrapMan		
M/N: TM8		
Test date: 2024-07-11	Pressure: 102.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lili	Test site: RF site	Temperature: 22.4±0.6℃

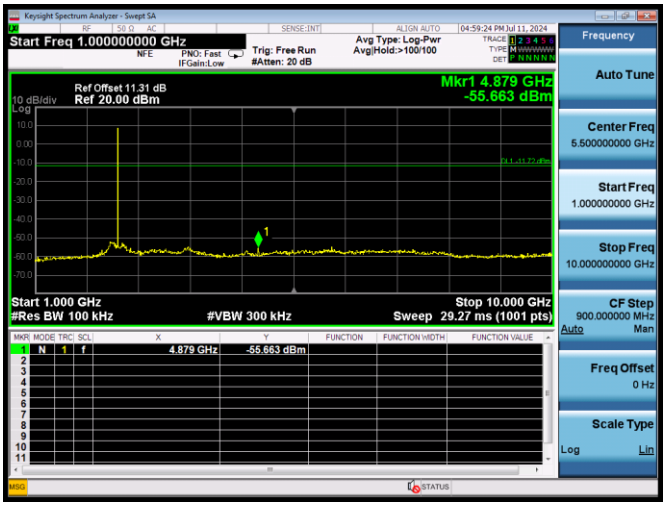
Hopping off	
GFSK	
2402MHz	2402MHz(2.3GHz – 2.4GHz)
	
2402MHz(30MHz – 1GHz)	2402MHz(10GHz – 26GHz)
	
2402MHz(1GHz – 10GHz)	2441MHz
	

2441MHz(30MHz – 1GHz)

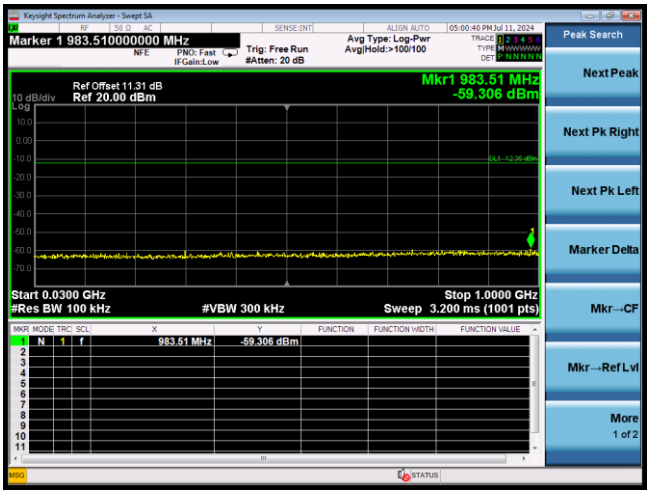


2480MHz

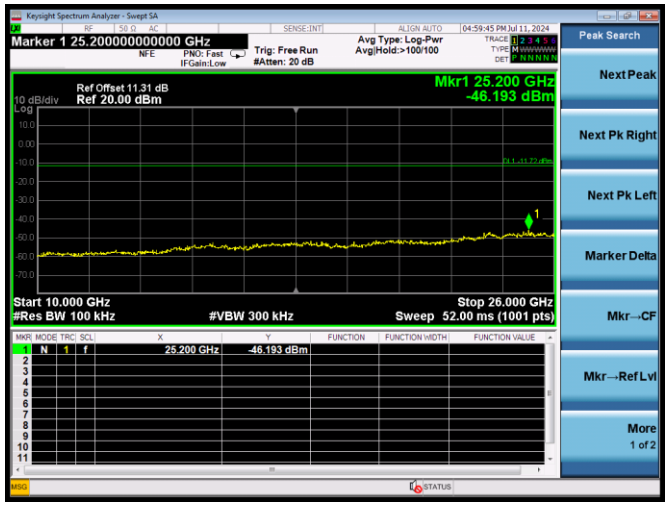
2441MHz(1GHz – 10GHz)



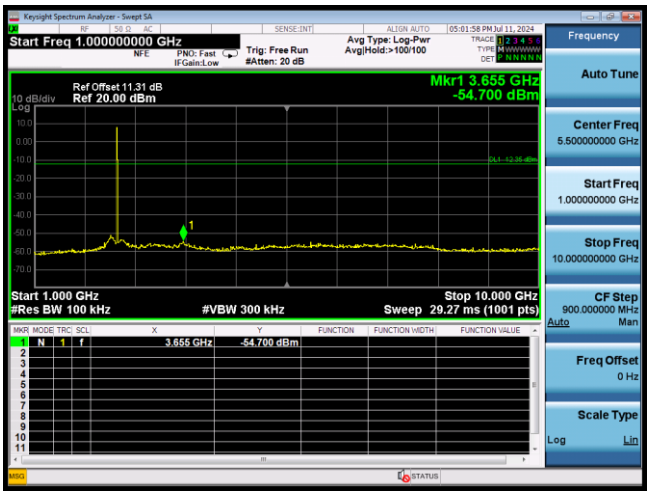
2480MHz(30MHz – 1GHz)

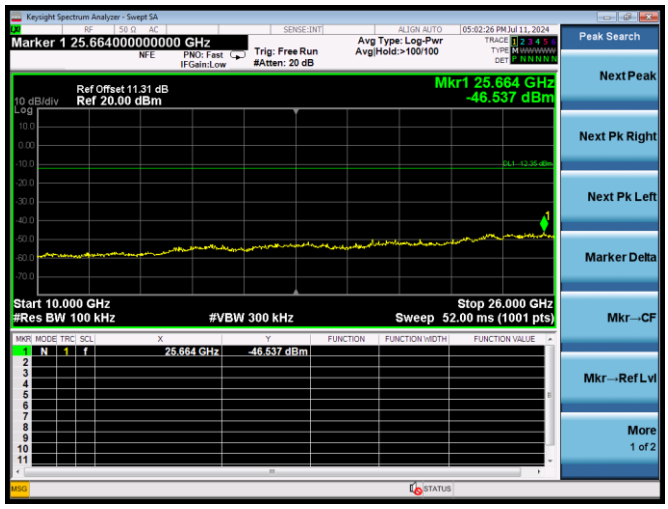
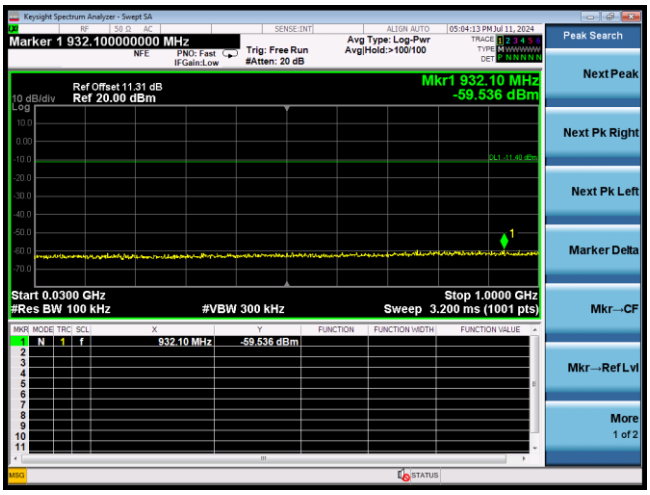
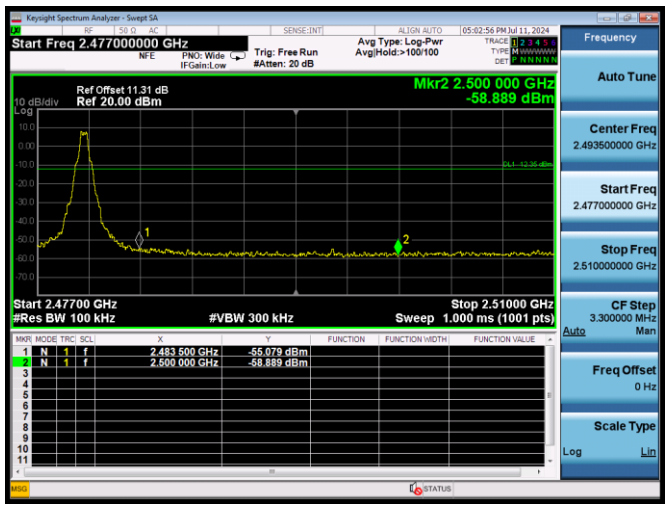
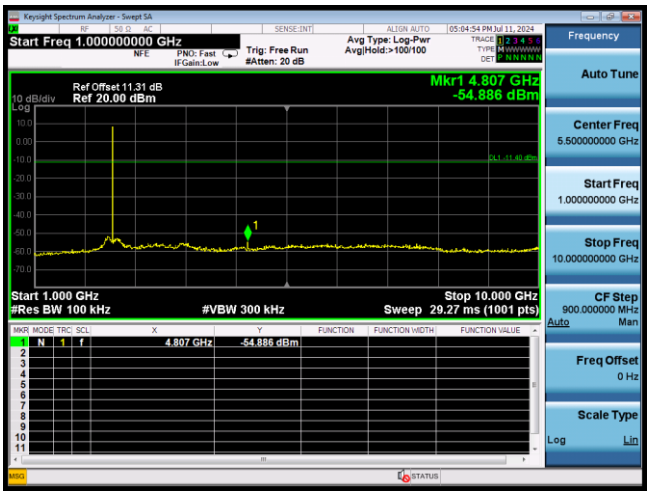
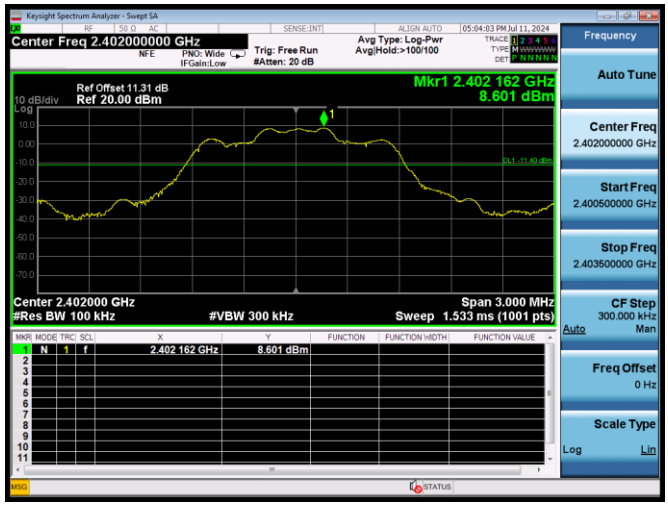
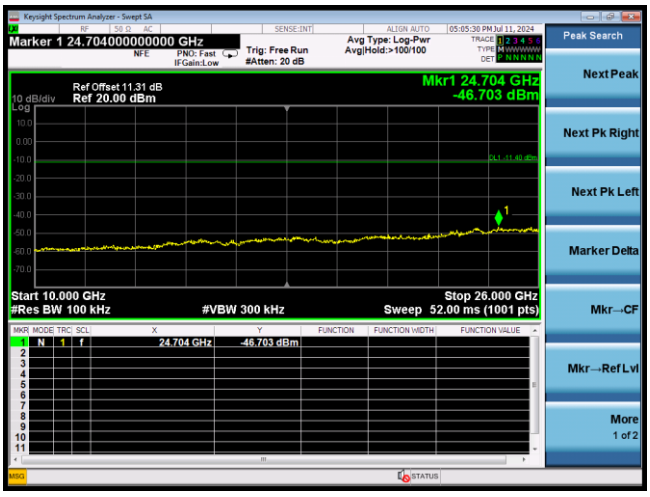


2441MHz(10GHz – 26GHz)

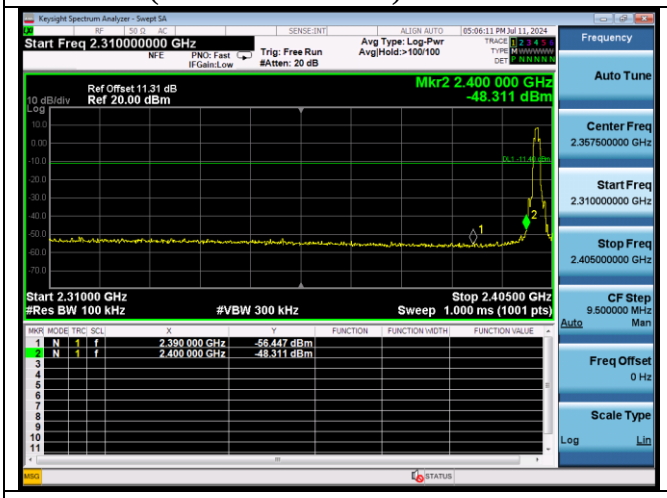


2480MHz(1GHz – 10GHz)

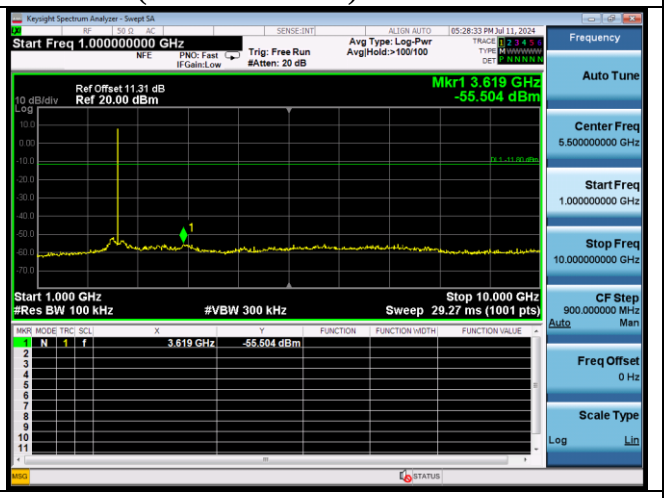


2480MHz(10GHz – 26GHz)	2402MHz(30MHz – 1GHz)
	
2480MHz(2.4GHz – 2.5GHz)	2402MHz(1GHz – 10GHz)
	
8-DPSK	
2402MHz	2402MHz(10GHz – 26GHz)
	

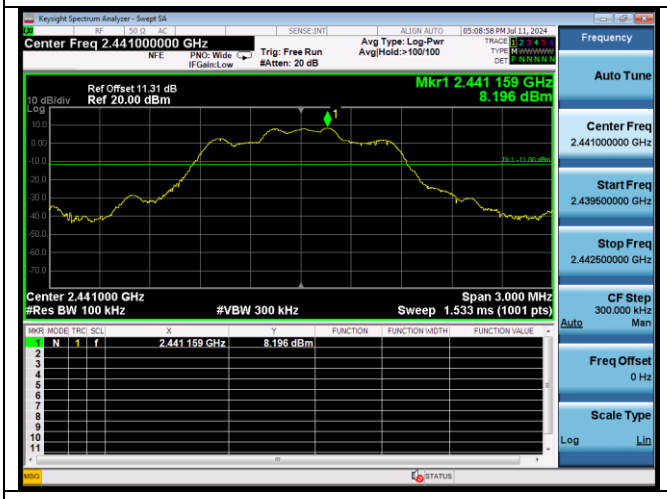
2402MHz(2.3GHz – 2.4GHz)



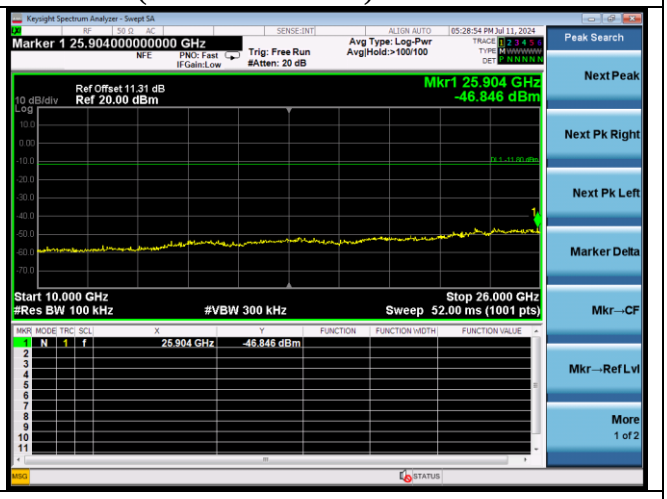
2441MHz(1GHz – 10GHz)



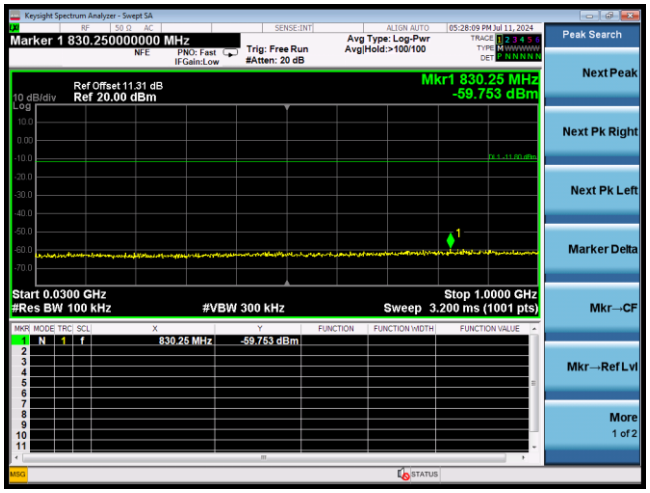
2441MHz



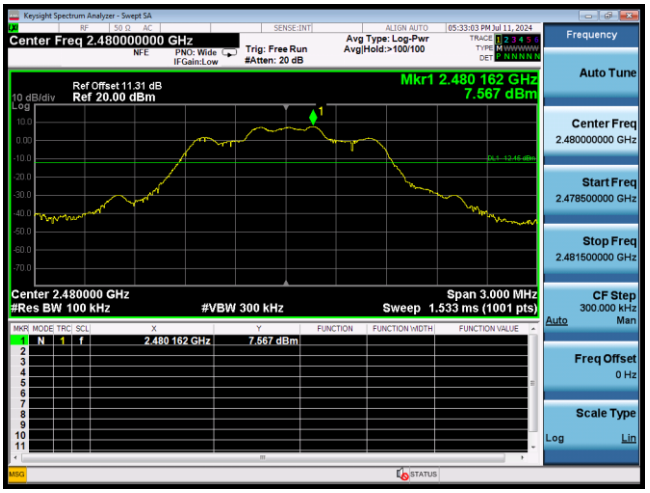
2441MHz(10GHz – 26GHz)



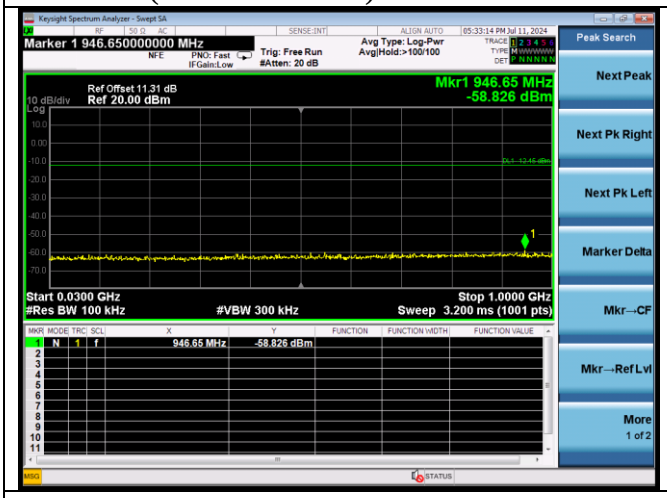
2441MHz (30MHz – 1GHz)



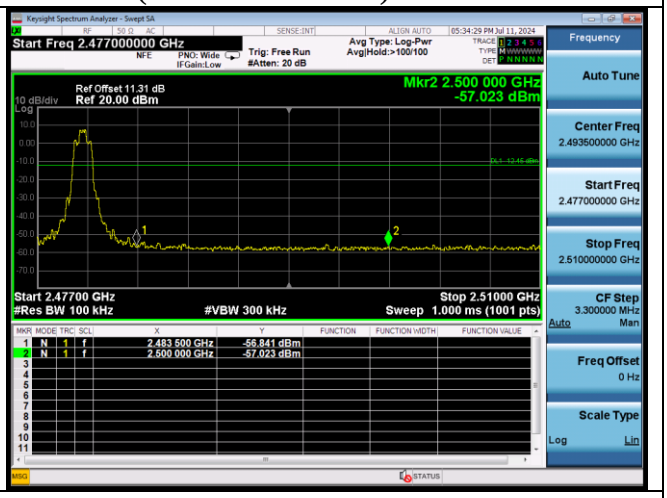
2480MHz



2480MHz(30MHz – 1GHz)

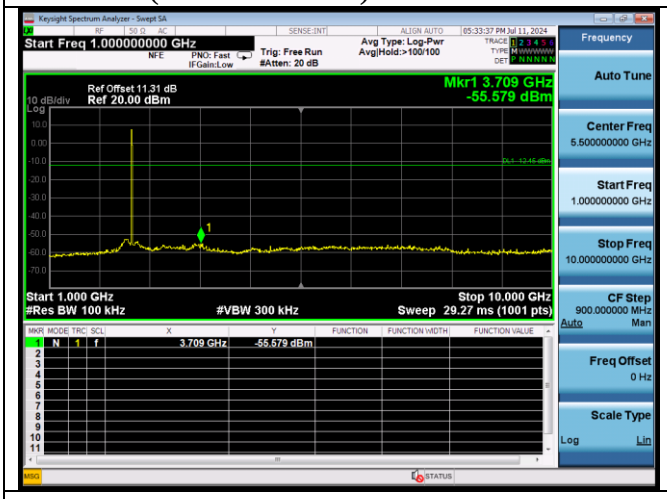


2480MHz(2.4GHz – 2.5GHz)

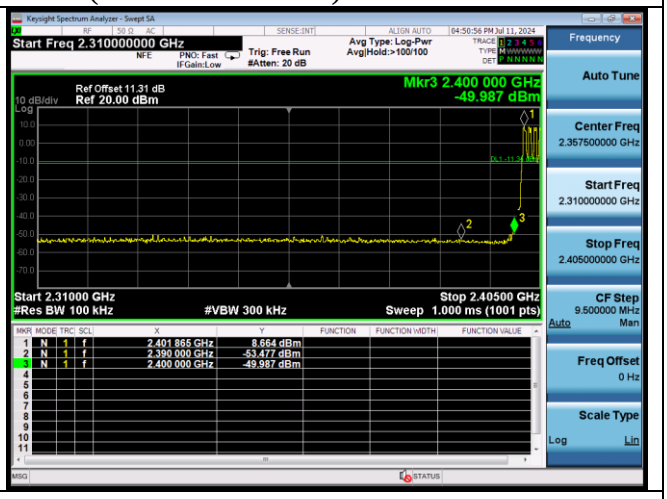


Hopping on

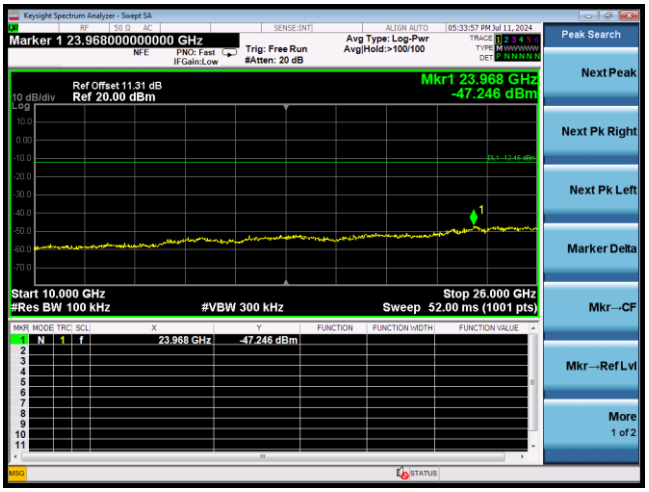
2480MHz(1GHz – 10GHz)



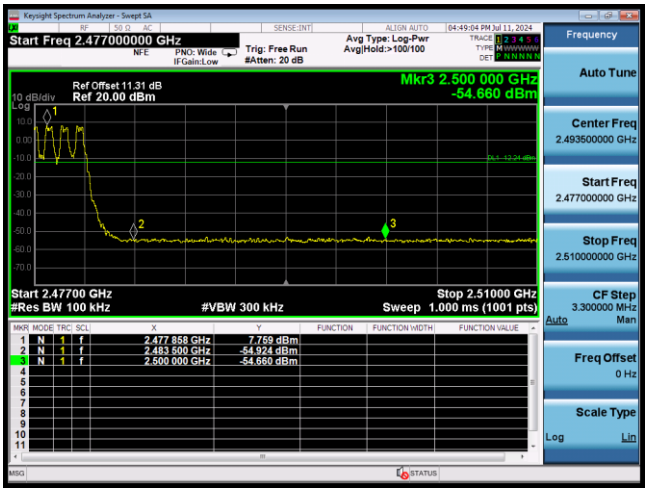
GFSK(2.3GHz – 2.4GHz)

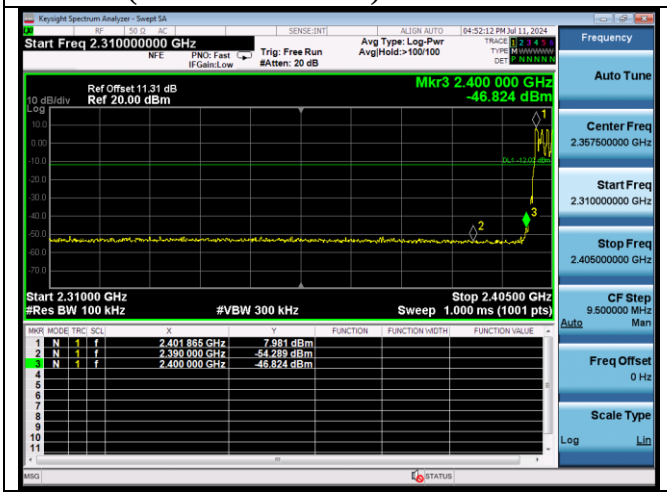
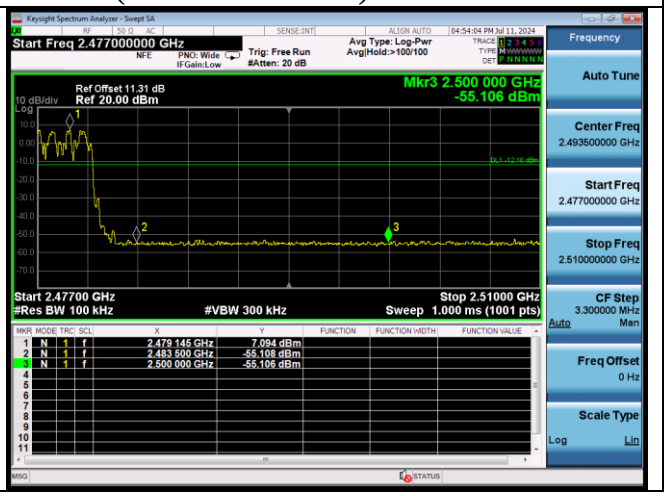


2480MHz(10GHz – 26GHz)



GFSK(2.4GHz – 2.5GHz)



8-DPSK(2.3GHz – 2.4GHz)	8-DPSK(2.4GHz – 2.5GHz)
	

6. 20 DB & 99% BANDWIDTH TEST

6.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Mar.16,24	1Year
2.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year
3.	Attenuator(10dB)	eastsheep	2W-SMA-JK-6G-10dB	No. 4	Sep.19,23	1 Year

6.2.Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.7:

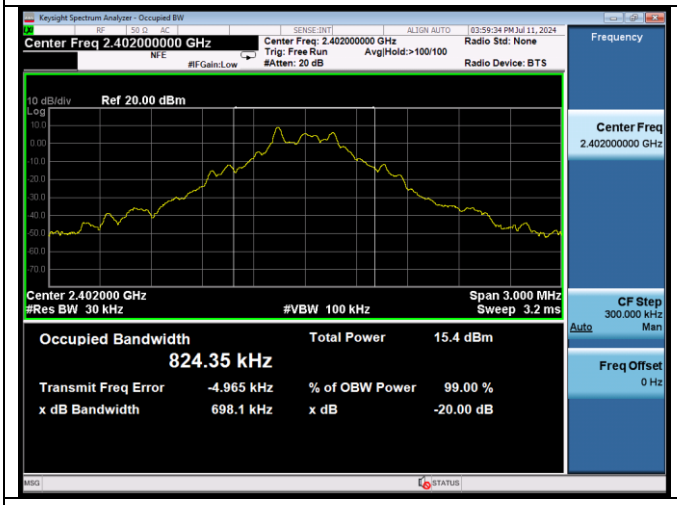
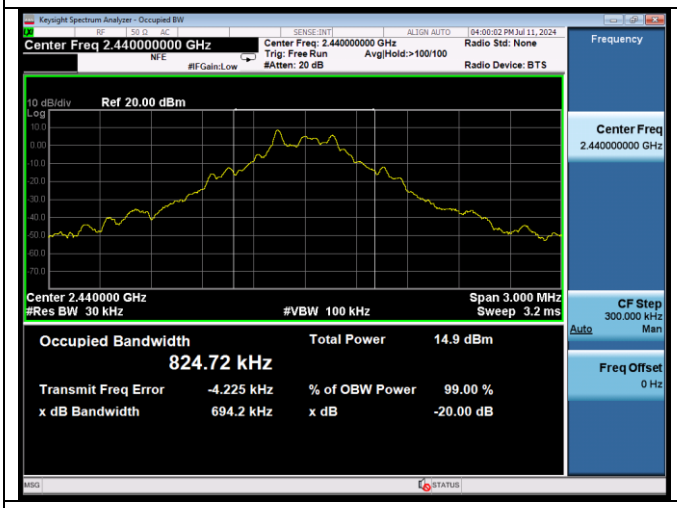
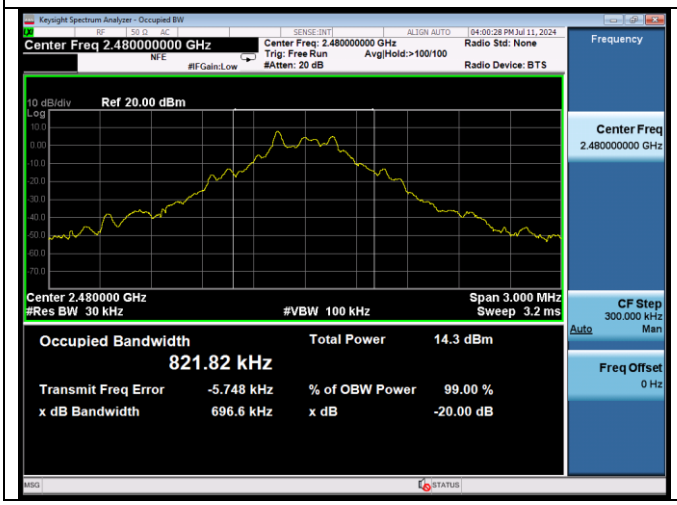
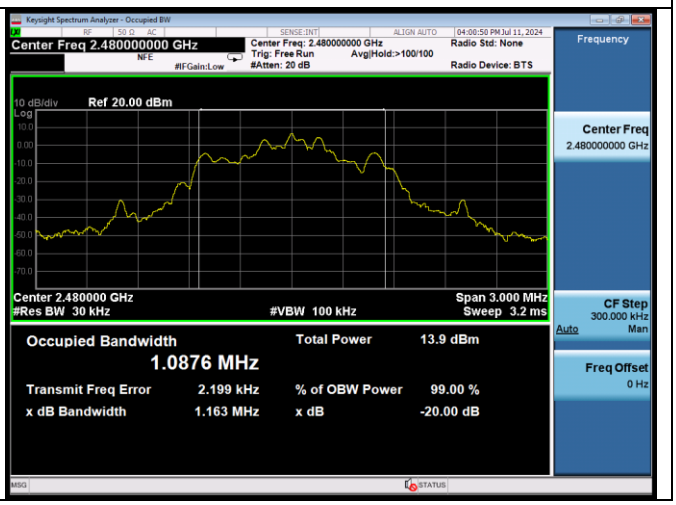
1. Connect the antenna port of the EUT to the spectrum analyzer.
2. Let the EUT transmit at Low/ Mid/ High channel with test software.
3. Setting of SA is following as: RBW: 30kHz / VBW: 100kHz
   Sweep Mode: Continuous sweep
   Detect mode: Positive peak
   Trace mode: Max hold.
4. Use the occupied bandwidth function of the SA measure the 20dB bandwidth directly.

6.4.Test Results

EUT: TrapMan		
M/N: TM8		
Test date: 2024-07-11	Pressure: 102.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lili	Test site: RF site	Temperature: 22.4±0.6℃

Test Mode	CH	-20dB Bandwidth (KHz)	Limit (KHz)
GFSK	CH0	698.1	N/A
	CH39	694.2	
	CH78	696.6	
8-DPSK	CH0	1160	N/A
	CH39	1161	
	CH78	1163	
Conclusion:Pass			

Test Mode	CH	99% Bandwidth (KHz)	Limit (KHz)
GFSK	CH0	824.35	N/A
	CH39	824.72	
	CH78	821.82	
8-DPSK	CH0	1084.8	N/A
	CH39	1086.2	
	CH78	1087.6	
Conclusion:Pass			

GFSK	8-DPSK
2402MHz	2402MHz
	
2441MHz	2441MHz
	
2480MHz	2480MHz
	

7. CARRIER FREQUENCY SEPARATION TEST

7.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Mar.16,24	1Year
2.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year

7.2.Limit

Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.3.Test Procedure

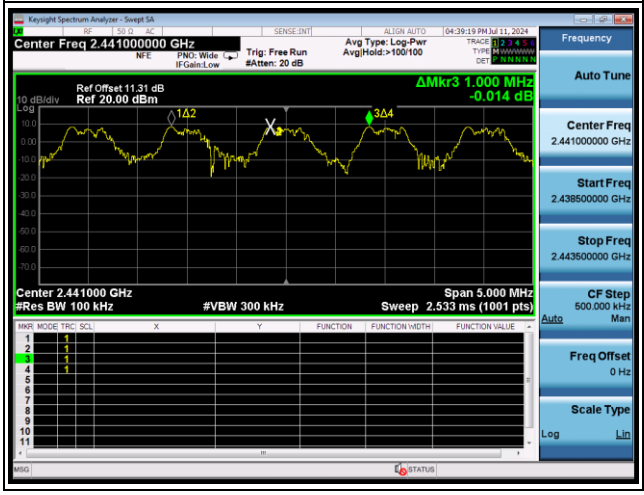
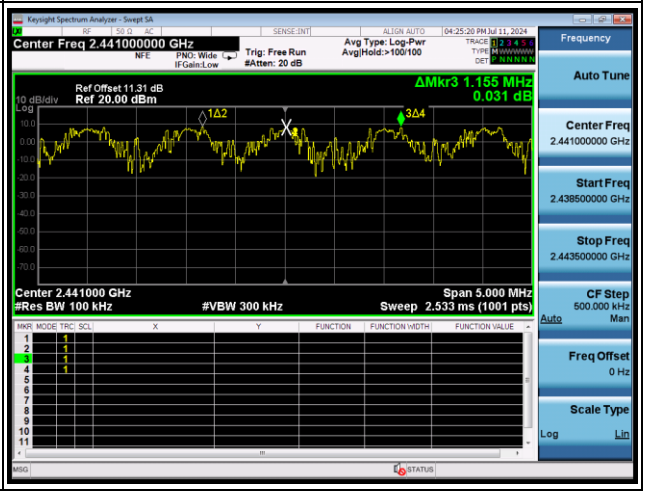
Use the test method descried in ANSI C63.10 clause 7.8.2:

1. Connect the antenna port of the EUT to the Spectrum analyzer.
2. Let the EUT transmit at Low/ Mid/ High channel.
3. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz.Span: 5MHz
4. Use the mark Delta function of the SA measure out the channel separation.

7.4.Test Results.

EUT: TrapMan		
M/N: TM8		
Test date: 2024-07-11	Pressure: 102.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lili	Test site: RF site	Temperature: 22.4±0.6℃

Test Mode	Channel separation	Limit(KHz)	Conclusion
GFSK	1.0MHz	465.4	PASS
8-DPSK	1.155MHz	775.3	PASS

GFSK	8-DPSK
	

8. NUMBER OF HOPPING FREQUENCY TEST

8.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Mar.16,24	1Year
2.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year
3.	Attenuator(10dB)	eastsheep	2W-SMA-JK-6G-10dB	No. 4	Sep.19,23	1 Year

8.2.Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

8.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.3:

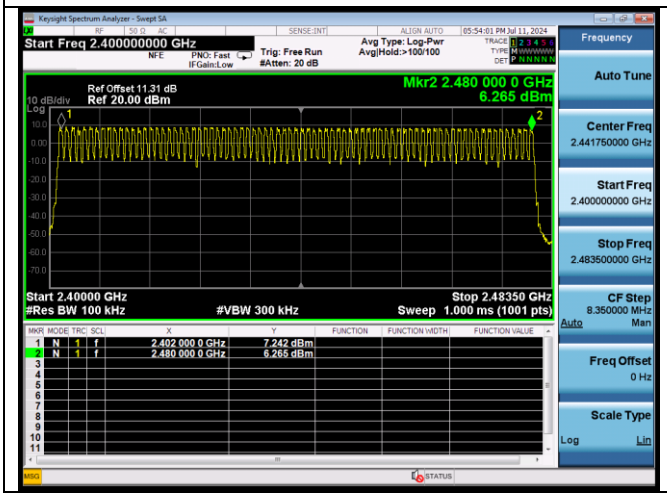
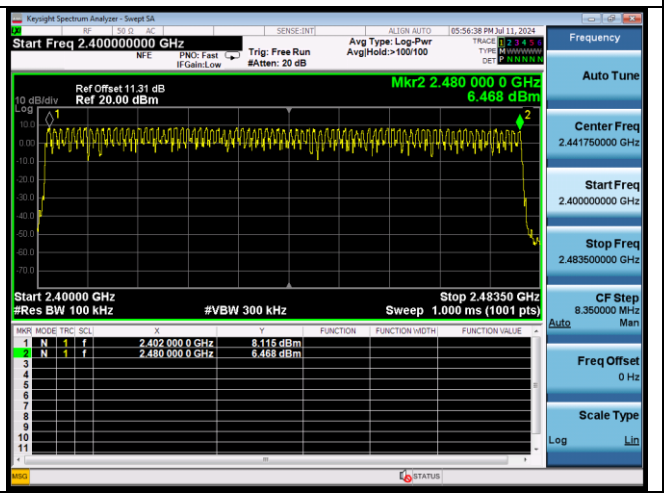
1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
2. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz，
   Start frequency: 2390MHz
   Stop frequency: 2483.5MHz

And waiting for the hopping trace until stability, count out the number of the hopping.

8.4.Test Results

EUT: TrapMan		
M/N: TM8		
Test date: 2024-07-11	Pressure: 102.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lili	Test site: RF site	Temperature: 22.4±0.6℃

Test Mode	Number of channel	Limit	Conclusion
GFSK	79	≥15	PASS
8-DPSK	79	≥15	PASS

GFSK	8-DPSK
	

9. DWELL TIME

9.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Mar.16,24	1Year
2.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3+190411	Sep.20,23	1 Year
3.	Attenuator(10dB)	eastsheep	2W-SMA-JK-6G-10dB	No. 4	Sep.19,23	1 Year

9.2.Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3.Test Procedure

Use the test method descried in ANSI C63.10 clause 7.8.4:

1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
2. Setting of SA is following as:
   RBW: 100kHz / VBW: 300kHz
   Sweep Mode: Single
   Detect mode: Positive peak
   Trace mode: Auto
   Span: 0Hz
   Sweep time: 5s and big enough to measure one hopping signal
3. Use below formula calculate the Dwell time
   Dwell time=Hopping number per second*0.4*channel number*Pulse bandwidth per hopping.

9.4.Test Results

EUT: TrapMan		
M/N: TM8		
Test date: 2024-07-12	Pressure: 102.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lili	Test site: RF site	Temperature: 22.4±0.6℃

Mode		dwell time	Limit	Conclusion
GFSK	DH1	49 hops/5s*0.4s*79chanels* 0.423 ms =130.995ms	≦400ms	PASS
	DH3	26 hops/5s*0.4s*79chanels* 1.677 ms =275.565ms	≦400ms	PASS
	DH5	17 hops/5s*0.4s*79chanels* 2.955 ms =317.485ms	≦400ms	PASS
8-DPSK	3-DH1	49 hops/5s*0.4s*79chanels* 0.433 ms =134.091ms	≦400ms	PASS
	3-DH3	22 hops/5s*0.4s*79chanels* 1.692 ms =235.256ms	≦400ms	PASS
	3-DH5	16 hops/5s*0.4s*79chanels* 2.965 ms =299.821ms	≦400ms	PASS

Note: All the lower levels were signaled from receiver and should not be considered in here.