

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 1 of 67

TEST REPORT

Application No.:SHCR2504000856HSFCC ID:ZT5-ORIGINAL5IC:9798A-ORIGINAL5

Applicant: Suzhou Armocon Technology Co.,Ltd.

Address of Applicant: 3-5/F No77 SuHong Middle Road SIP Jiangsu China

Manufacturer: Suzhou Armocon Technology Co.,Ltd.

Address of Manufacturer: 3-5/F No77 SuHong Middle Road SIP Jiangsu China

Factory: Suzhou Armocon Technology Co.,Ltd.

Address of Factory: 3-5/F No77 SuHong Middle Road SIP Jiangsu China

Equipment Under Test (EUT):

EUT Name: Handheld massager

Model No.: KAYA™ Originals, MAYA™ 2

Remark: Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

Trade Mark: LELO, Intimina

Standard(s): 47 CFR Part 15, Subpart C 15.247

RSS-247 Issue 3, August 2023

RSS-Gen Issue 5 Amendment 2 (February 2021)

Date of Receipt: 2025-04-15

Date of Test: 2025-04-16 to 2025-05-06

Date of Issue: 2025-05-07

Test Result: Pass*

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only. Member of the SGS Group (SGS SA)

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



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR250400085601 Page: 2 of 67

	Revision Record			
Version	Description	Date	Remark	
00	Original	2025-05-07	1	

Authorized for issue by:			
Tested By	Bril Wu		
	Bill Wu/Project Engineer		
Approved By	Parlam Zhan		
	Parlam Zhan / Reviewer	_	



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 3 of 67

2 Test Summary

Radio Spectrum Technical Requirement					
Item	FCC Requirement	IC Requirement	Method	Result	
Antenna Requirement	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	RSS-Gen Clause 6.8	N/A	Customer Declaration	

N/A: Not applicable

Radio Spectrum Matter Part				
Item	FCC Requirement	IC Requirement	Method	Result
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247a(2)	RSS-247 Clause 5.2(a)	ANSI C63.10 (2013) Section 11.8.1	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247(b)(3)	RSS-247 Clause 5.4(d)	ANSI C63.10 (2013) Section 11.9.1	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247(e)	RSS-247 Clause 5.2(b)	ANSI C63.10 (2013) Section 11.10.2	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.13.3.2	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.11	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.10.5	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass
99% Bandwidth	-	RSS-Gen Section 6.7	ANSI C63.10 Section 6.9.3	Pass

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model KAYA $^{\text{TM}}$ Originals was tested since their differences were the model number and appearance color.



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR250400085601 Page: 4 of 67

3 **Contents**

			Page
1	COV	ER PAGE	1
2	Tost	Summary	4
_	1631	Guilliary	
3	Cont	ents	4
4	Gene	eral Information	6
	4.1	Details of E.U.T	e
		Power level setting using in test:	
		Description of Support Units	
		Measurement Uncertainty	
		Test Location	
		Test Facility	
	4.7	Deviation from Standards	7
	4.8	Abnormalities from Standard Conditions	7
5	Equi	pment List	8
6	Dodi:	o Spectrum Technical Dequirement	c
6		o Spectrum Technical Requirement	
		Antenna Requirement	
	6.1.1 6.1.2		
	_		
7	Radio	o Spectrum Matter Test Results	10
	7.1	Radiated Emissions which fall in the restricted bands	
	7.1.1		
	7.1.2	and the same production of the same productin	
	7.1.3	1 5	
	7.1.4		
	7.2 7.2.1	Radiated Spurious Emissions Below 1GHz	
	7.2.1		
	7.2.2	•	
	7.2.4	, e	
		Radiated Spurious Emissions Above 1GHz	
	7.3.1	E.U.T. Operation	
	7.3.2	·	
	7.3.3		
	7.3.4		
		Conducted Peak Output Power	
	7.4.1	E.U.T. Operation	
	7.4.2	1 0	
	7.4.3	Measurement Procedure and Data Minimum 6dB Bandwidth	
	7.5 7.5.1	E.U.T. Operation	
	7.5.1	·	
	7.5.2	·	
	7.5.4	1 0	
		Power Spectrum Density	
	7.6.1	E.U.T. Operation	
	7.6.2	·	
	7.6.3	Test Setup Diagram	40



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR250400085601 Page: 5 of 67

	7.6.4	Measurement Procedure and Data	40
7.		onducted Band Edges Measurement	
		E.U.T. Operation	
		Test Mode Description	
		Test Setup Diagram	
		Measurement Procedure and Data	
7.		onducted Spurious Emissions	
	7.8.1	E.U.T. Operation	42
		Test Mode Description	
		Test Setup Diagram	
		Measurement Procedure and Data	
7.		% Bandwidth	
	7.9.1	E.U.T. Operation	43
		Test Mode Description	
		Test Setup Diagram	
	7.9.4	Measurement Procedure and Data	43
8	Test Se	tup Photo	44
9	EUT Co	onstructional Details (EUT Photos)	44
10	Append	lix	42



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 6 of 67

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V Rechargeable battery
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	Multilayer Ceramic Antenna
Antenna Gain:	2 dBi(Provided by manufacturer)
S/N:	00257fxdAa5059t
Firmware Version:	KAYA Originals F. REV.A

4.2 Power level setting using in test:

Channel	Power setting
0	-2.5
19	-2.5
39	-2.5

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	LENOVO	L460	-
Serial port adapter plate	-	Test Plate 3	-

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF conducted power	0.6dB
6	RF power density	2.9dB
7	Conducted Spurious emissions	0.75dB
0	DE Dadiated names	5.2dB (Below 1GHz)
8	RF Radiated power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
	Dedicted Courieus emission test	4.5dB (30MHz-1GHz)
9	Radiated Spurious emission test	5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 7 of 67

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

- 1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc.) is provided by the applicant. (if applicable).
- 2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).
- 3. Sample source: sent by customer.

4.6 Test Facility

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

A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR250400085601 Page: 8 of 67

Equipment List 5

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test					•
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2024/12/18	2025-12-17
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2024/12/18	2025-12-17
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2025-04-30	2026-04-29
Signal Generator	R&S	SMR20	SHEM006-1	2024-07-31	2025-07-30
Signal Generator	Agilent	N5182A	SHEM182-1	2024-07-31	2025-07-30
Communication Tester	R&S	CMW270	SHEM183-1	2025-04-30	2026-04-29
Communication Tester	R&S	CMW500	SHEM268-1	2025-04-30	2026-04-29
Power Sensor	Keysight	U2021XA * 4	SHEM293-1	2024-07-31	2025-07-30
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2024-11-05	2026-11-04
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2024/12/18	2025-12-17
DC Power Supply	HP	6010A	SHEM222-1	2024/12/18	2025-12-17
Conducted test Cable	/	RF01~RF04	/	2024/12/18	2025-12-17
Switcher	Tonscend	JS0806	SHEM293-1	2024-07-31	2025-07-30
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	/
Switcher+Power Sensor	TST	TSPS2023R	SHEM263-1	2024-07-31	2025-07-30
Test software	TST	TST PASS	Version: 2.0	/	/
RF Radiated Test	•	•	•		
EMI test Receiver	R&S	ESU40	SHEM051-1	2024/12/18	2025-12-17
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2024/12/18	2025-12-17
Communication Tester	R&S	CMW500	SHEM268-1	2025-04-30	2026-04-29
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2024/12/18	2025-12-17
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2023-09-03	2025-09-02
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2025-04-12	2027-04-11
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2024-08-05	2026-08-04
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2023-09-03	2025-09-02
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2023-09-03	2025-09-02
Pre-Amplifier	HP	8447D	SHEM236-1	2024/12/18	2025-12-17
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2024/12/18	2025-12-17
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2023-05-06	2026-05-05
RE test Cable	/	PT18-NMNM-10M	SHEM217-2	2024/12/18	2025-12-17
Test software	ESE	E3	Version: 6.111221a	/	/



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 9 of 67

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is xx dBi.

Antenna location: Refer to internal photo.



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 10 of 67

7 Radio Spectrum Matter Test Results

7.1 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Frequency(MHz) Field strength(microvolts/meter)	
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

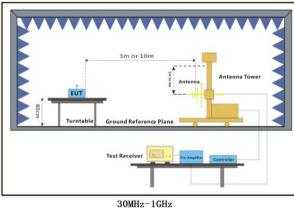


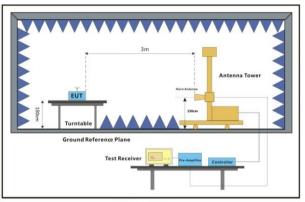
SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 11 of 67

7.1.3 Test Setup Diagram





-1GHz Above 1GHz

7.1.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.
- Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.
- Remark 4:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is \geq 1/T (Duty cycle \leq 98%) or 10Hz (Duty cycle \geq 98%) for Average detection (AV) at frequency above 1GHz.

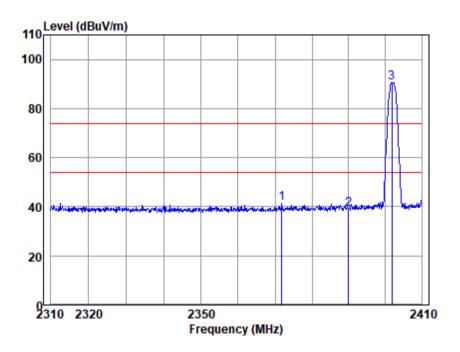


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 12 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2371.802	44.53	28.71	3.32	35.17	41.39	74.00	-32.61	Peak
2390.000	42.14	28.80	3.33	35.18	39.09	74.00	-34.91	Peak
2401.843	93.54	28.85	3.34	35.19	90.54	74.00	16.54	Peak

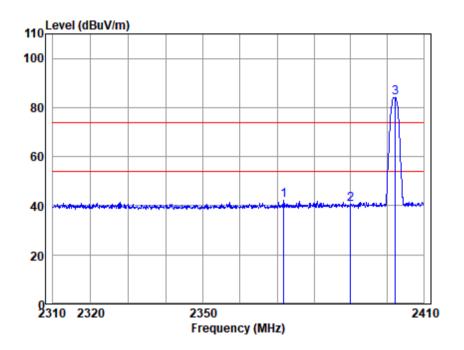


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 13 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2371.802	45.20	28.71	3.32	35.17	42.06	74.00	-31.94	Peak
2390.000	43.55	28.80	3.33	35.18	40.50	74.00	-33.50	Peak
2402.250	87.16	28.85	3.34	35.19	84.16	74.00	10.16	Peak

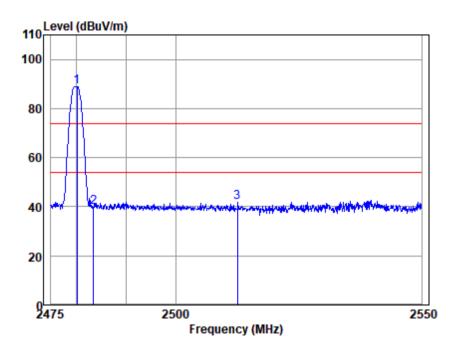


SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 14 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity : HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2480.251	91.80	29.08	3.40	35.25	89.03	74.00	15.03	Peak
2483.500	42.61	29.09	3.41	35.26	39.85	74.00	-34.15	Peak
2512.520	44.74	29.13	3.43	35.29	42.01	74.00	-31.99	Peak

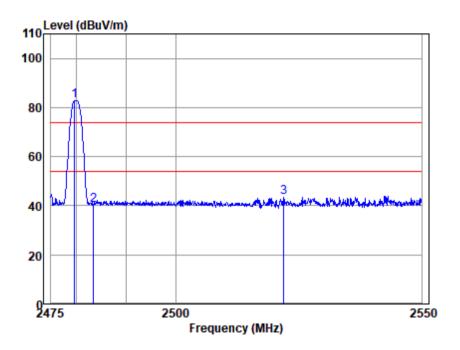


SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 15 of 67

Test Mode: 00; Polarity: Vertical; Modulation: GFSK; Channel: High



Antenna Polarity : VERTICAL EUT/Project :0856HS

_					Emission			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
*****	Jp	dp /		Jn.	dp/	Jp/	Jn.	
MHZ	abuv	aB/m	ав	ав	dBuv/m	abuv/m	ав	
2479.733	85.57	29.08	3.40	35.25	82.80	74.00	8.80	Peak
2483.500	43.09	29.09	3.41	35.26	40.33	74.00	-33.67	Peak
2521.838	46.23	29.13	3.44	35.30	43.50	74.00	-30.50	Peak

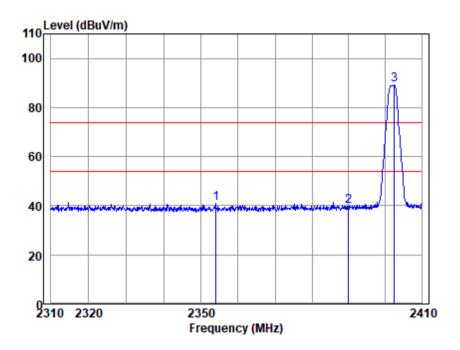


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 16 of 67

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL

EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2353.977	44.22	28.61	3.30	35.15	40.98	74.00	-33.02	Peak
2390.000	43.00	28.80	3.33	35.18	39.95	74.00	-34.05	Peak
2402.454	92.21	28.85	3.34	35.19	89.21	74.00	15.21	Peak

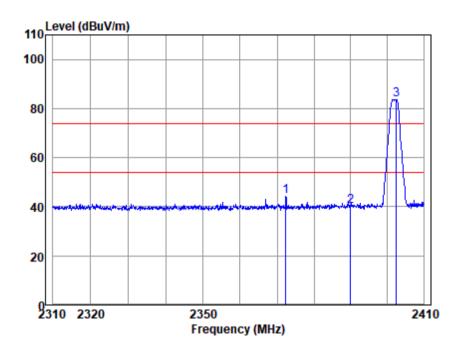


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 17 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2372.304	47.41	28.71	3.32	35.17	44.27	74.00	-29.73	Peak
2390.000	43.16	28.80	3.33	35.18	40.11	74.00	-33.89	Peak
2402.454	86.77	28.85	3.34	35.19	83.77	74.00	9.77	Peak

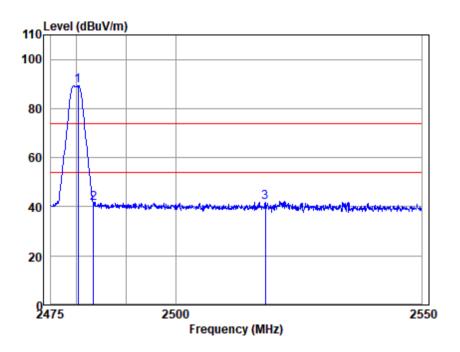


SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 18 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity : HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2480.474	92.09	29.08	3.40	35.25	89.32	74.00	15.32	Peak
2483.500	44.19	29.09	3.41	35.26	41.43	74.00	-32.57	Peak
2518.152	44.47	29.13	3.44	35.30	41.74	74.00	-32.26	Peak

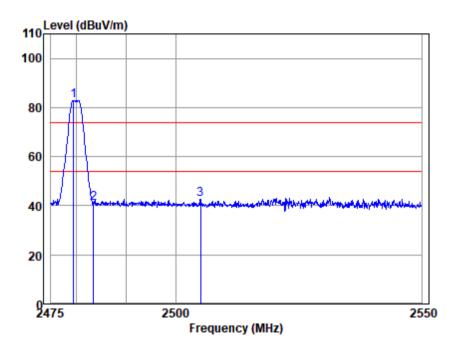


SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 19 of 67

Test Mode: 00; Polarity: Vertical; Modulation: GFSK; Channel: High



Antenna Polarity : VERTICAL EUT/Project :0856HS

_					Emission			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MU-	dBuy	dp/m	40	dp	dBuv/m	dBuy/m	40	
		-			-	-		
2479.511	85.75	29.08	3.40	35.25	82.98	74.00	8.98	Peak
2483.500	43.88	29.09	3.41	35.26	41.12	74.00	-32.88	Peak
2505.031	45.49	29.13	3.43	35.28	42.77	74.00	-31.23	Peak



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 20 of 67

7.2 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)		
0.009-0.490	2400/F(kHz)	300		
0.490-1.705	24000/F(kHz)	30		
1.705-30.0	30	30		
30-88	100	3		
88-216	150	3		
216-960	200	3		
960-1000	500	3		

7.2.1 E.U.T. Operation

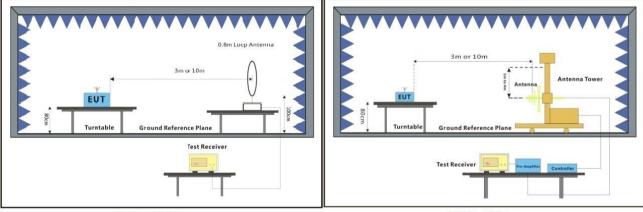
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.2.3 Test Setup Diagram



Below 30MHz 30MHz-1GHz



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 21 of 67

7.2.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

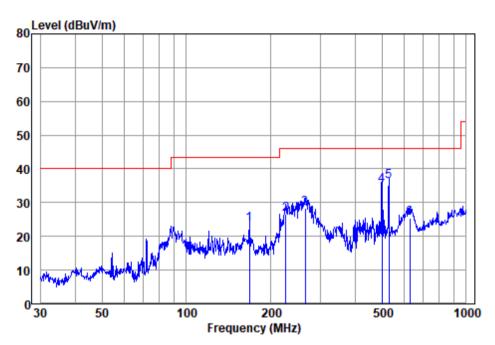


SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 22 of 67

Test Mode: 00; Polarity: Horizontal



Antenna Polarity : HORIZONTAL EUT/Project :0856HS

Test mode :00

		Read	Antenna	Cable	Preamp	Emission	Limit	0ver	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	167.824	40.81	12.90	2.86	33.00	23.57	43.50	-19.93	QP
2	226.894	46.23	10.04	3.20	32.89	26.58	46.00	-19.42	QP
3	265.676	45.36	12.16	3.69	32.83	28.38	46.00	-17.62	QP
4	499.425	45.10	18.00	4.96	32.80	35.26	46.00	-10.74	QP
5	528.246	45.49	18.46	5.11	32.74	36.32	46.00	-9.68	QP
6	627.274	32.15	20.45	5.59	32.69	25.50	46.00	-20.50	QP
Note:E	mission L	evel=Re	ad Level	+Anteni	na Facto	or+Cable	loss-Pr	reamp Fac	ctor

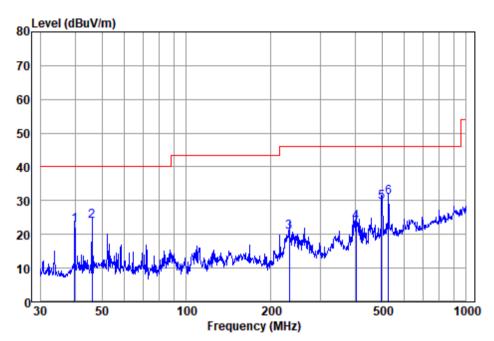


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 23 of 67

Test Mode: 00; Polarity: Vertical



Antenna Polarity :VERTICAL EUT/Project :0856HS Test mode :00

		Read	Antenna	Cable	Preamp	Emission	ı Limit	0ver	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.854	41.24	13.40	1.37	33.20	22.81	40.00	-17.19	QP
2	46.016	41.93	13.80	1.40	33.20	23.93	40.00	-16.07	QP
3	233.349	39.86	10.40	3.25	32.86	20.65	46.00	-25.35	QP
4	403.250	36.07	15.83	4.36	32.79	23.47	46.00	-22.53	QP
5	497.677	39.54	17.96	4.95	32.80	29.65	46.00	-16.35	QP
6	526.397	40.28	18.42	5.10	32.75	31.05	46.00	-14.95	QP
								_	



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 24 of 67

7.3 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

7.3.1 E.U.T. Operation

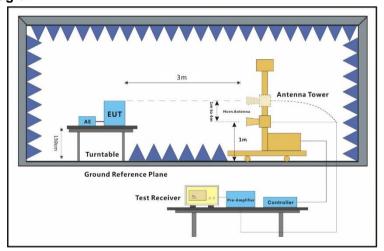
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

7.0.2 1.000 11		56. Ptiet.
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.3.3 Test Setup Diagram





SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 25 of 67

7.3.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.
- 5:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is \geq 1/T (Duty cycle \leq 98%) or 10Hz (Duty cycle \geq 98%) for Average detection (AV) at frequency above 1GHz.

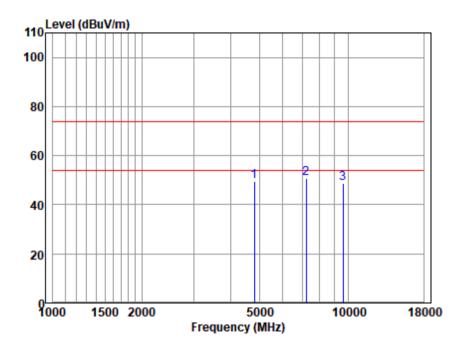


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 26 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4804.110	47.69	33.57	5.23	36.79	49.70	74.00	-24.30	Peak
7200.309	42.79	36.24	7.33	35.53	50.83	74.00	-23.17	Peak
9613.430	35.71	37.75	8.74	33.58	48.62	74.00	-25.38	Peak

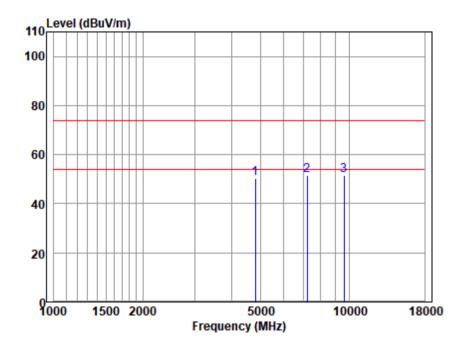


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 27 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4804.110	48.22	33.57	5.23	36.79	50.23	74.00	-23.77	Peak
7200.309	43.48	36.24	7.33	35.53	51.52	74.00	-22.48	Peak
9613.430	38.54	37.75	8.74	33.58	51.45	74.00	-22.55	Peak

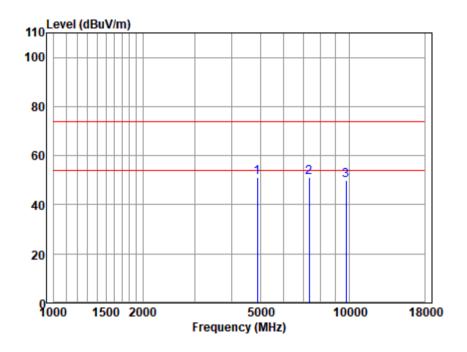


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 28 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.043	48.85	33.66	5.28	36.81	50.98	74.00	-23.02	Peak
7326.267	42.96	36.33	7.44	35.42	51.31	74.00	-22.69	Peak
9753.371	36.97	37.54	8.80	33.50	49.81	74.00	-24.19	Peak

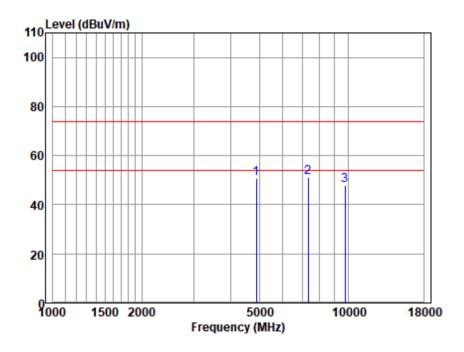


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 29 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:middle



Antenna Polarity :VERTICAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.043	48.62	33.66	5.28	36.81	50.75	74.00	-23.25	Peak
7326.267	42.61	36.33	7.44	35.42	50.96	74.00	-23.04	Peak
9753.371	35.25	37.54	8.80	33.50	48.09	74.00	-25.91	Peak

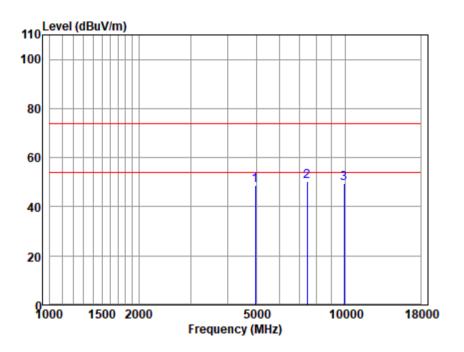


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 30 of 67

Test Mode: 00; Polarity: Horizontal; Modulation: GFSK; Channel: High



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Read Antenna Cable Preamp Emission Limit Over
Freq Level Factor Loss Factor Level Line Limit Remark
----- MHz dBuv dB/m dB dB dBuv/m dBuv/m dB
4960.307 46.74 33.65 5.34 36.83 48.90 74.00 -25.10 Peak

7432.914 41.72 36.31 7.53 35.34 50.22 74.00 -23.78 Peak 9923.991 36.51 37.62 8.88 33.41 49.60 74.00 -24.40 Peak

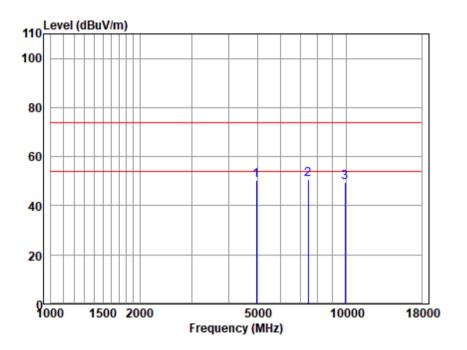


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 31 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL EUT/Project :0856HS

					Emission			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.307	48.35	33.65	5.34	36.83	50.51	74.00	-23.49	Peak
7432.914	42.09	36.31	7.53	35.34	50.59	74.00	-23.41	Peak
9923.991	36.34	37.62	8.88	33.41	49.43	74.00	-24.57	Peak

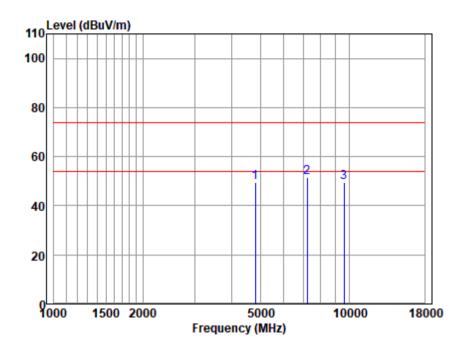


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 32 of 67

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4804.110	47.44	33.57	5.23	36.79	49.45	74.00	-24.55	Peak
7200.309	43.54	36.24	7.33	35.53	51.58	74.00	-22.42	Peak
9613.430	36.49	37.75	8.74	33.58	49.40	74.00	-24.60	Peak

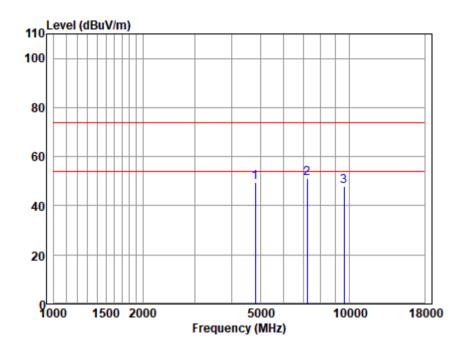


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 33 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL EUT/Project :0856HS

5					Emission			Dl-
Freq	rever	ractor	LOSS	ractor	Level	Line	Limit	Kemark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4804.110	47.35	33.57	5.23	36.79	49.36	74.00	-24.64	Peak
7200.309	43.29	36.24	7.33	35.53	51.33	74.00	-22.67	Peak
9613.430	35.15	37.75	8.74	33.58	48.06	74.00	-25.94	Peak

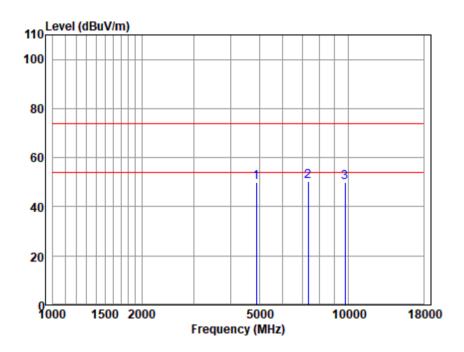


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 34 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Read Antenna Cable Preamp Emission Limit Over Level Factor Loss Factor Level Line Limit Remark Freq ----dB dB dBuv/m dBuv/m dB MHz dBuv dB/m 33.66 5.28 36.81 50.02 4880.043 47.89 74.00 -23.98 Peak 7.44 35.42 50.25 36.33 7326.267 41.90 74.00 -23.75 Peak 9753.371 37.13 37.54 8.80 33.50 49.97 74.00 -24.03 Peak

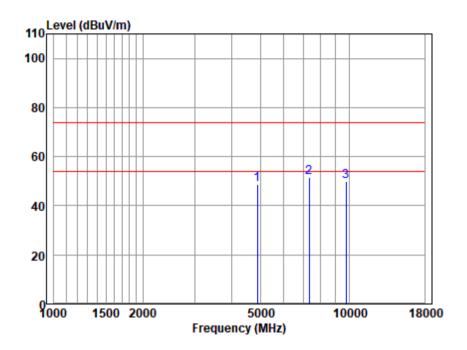


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 35 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:middle



Antenna Polarity :VERTICAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.043	46.71	33.66	5.28	36.81	48.84	74.00	-25.16	Peak
7326.267	43.40	36.33	7.44	35.42	51.75	74.00	-22.25	Peak
9753.371	36.91	37.54	8.80	33.50	49.75	74.00	-24.25	Peak

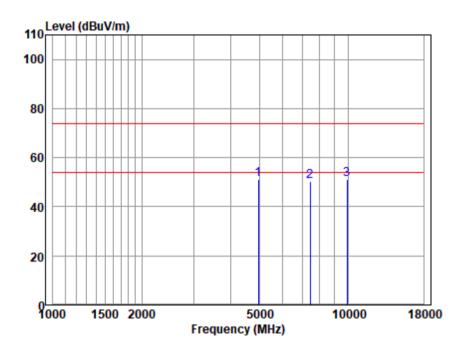


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 36 of 67

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity :HORIZONTAL EUT/Project :0856HS

Freq					Emission Level			Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.307	48.89	33.65	5.34	36.83	51.05	74.00	-22.95	Peak
7432.914	41.93	36.31	7.53	35.34	50.43	74.00	-23.57	Peak
9923.991	37.88	37.62	8.88	33.41	50.97	74.00	-23.03	Peak

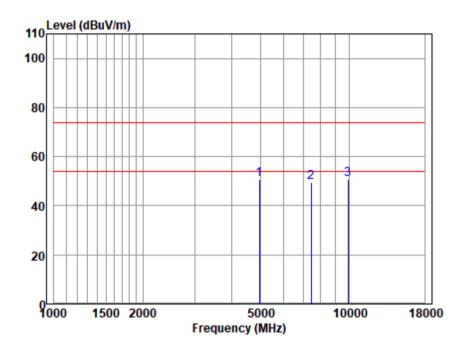


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 37 of 67

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL EUT/Project :0856HS

					Emission			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4960.307	48.55	33.65	5.34	36.83	50.71	74.00	-23.29	Peak
7432.914	41.21	36.31	7.53	35.34	49.71	74.00	-24.29	Peak
9923.991	37.57	37.62	8.88	33.41	50.66	74.00	-23.34	Peak

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 38 of 67

7.4 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.1

Limit:

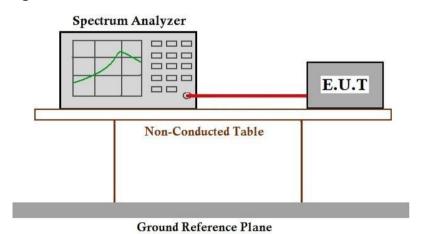
Frequency range(MHz)	Output power of the intentional radiator(watt)			
	1 for ≥50 hopping channels			
902-928	0.25 for 25≤ hopping channels <50			
	1 for digital modulation			
	1 for ≥75 non-overlapping hopping channels			
2400-2483.5	0.125 for all other frequency hopping systems			
	1 for digital modulation			
5725-5850	1 for frequency hopping systems and digital modulation			

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 39 of 67

7.5 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit: ≥500 kHz

7.5.1 E.U.T. Operation

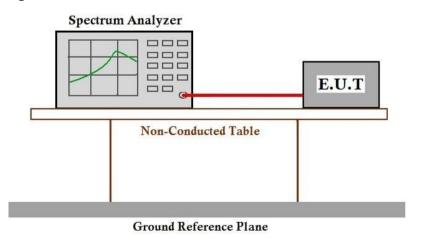
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 40 of 67

7.6 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

7.6.1 E.U.T. Operation

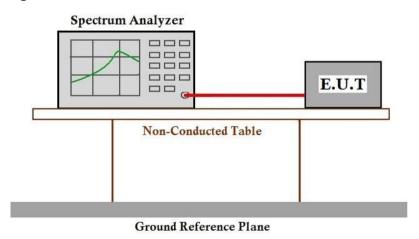
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Tiel Tool mode Dood plan							
Pre-scan / Final test	Mode Code	Description					
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 41 of 67

7.7 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

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

7.7.1 E.U.T. Operation

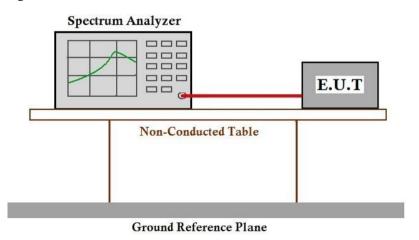
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description					
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 42 of 67

7.8 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

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

7.8.1 E.U.T. Operation

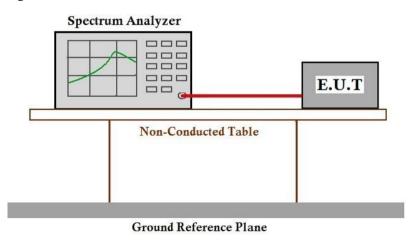
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

the state of the s							
Pre-scan / Final test	Mode Code	Description					
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					

7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 43 of 67

7.9 99% Bandwidth

Test Requirement RSS-Gen Section 6.7

Test Method: ANSI C63.10 (2013) Section 6.9.3

Measurement Distance: 3m

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description					
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					
Pre-scan	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.					

7.9.3 Test Setup Diagram

7.9.4 Measurement Procedure and Data



SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 44 of 67

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2504000856HS

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SHCR2504000856HS

10 Appendix

1. Bandwidth

1.1 Test Result

1.1.1 OBW

Mada	TX	Frequency	ANIT	99% Occupied E	Vardiet	
Mode	Type	(MHz)	ANT	Result	Limit	Verdict
		2402	1	1.017	/	Pass
1M	SISO	2440	1	1.024	/	Pass
		2480	1	1.013	/	Pass
		2402	1	2.050	/	Pass
2M	SISO	2440	1	2.053	/	Pass
		2480	1	2.032	/	Pass

1.1.2 6dB BW

Mode	TX	Frequency (MHz)	ANIT	6dB Bandv	\/a =diat	
Mode	Type		ANT	Result	Limit	Verdict
		2402	1	0.682	>=0.5	Pass
1M	SISO	2440	1	0.697	>=0.5	Pass
		2480	1	0.678	>=0.5	Pass
		2402	1	1.382	>=0.5	Pass
2M	SISO	2440	1	1.377	>=0.5	Pass
		2480	1	1.366	>=0.5	Pass



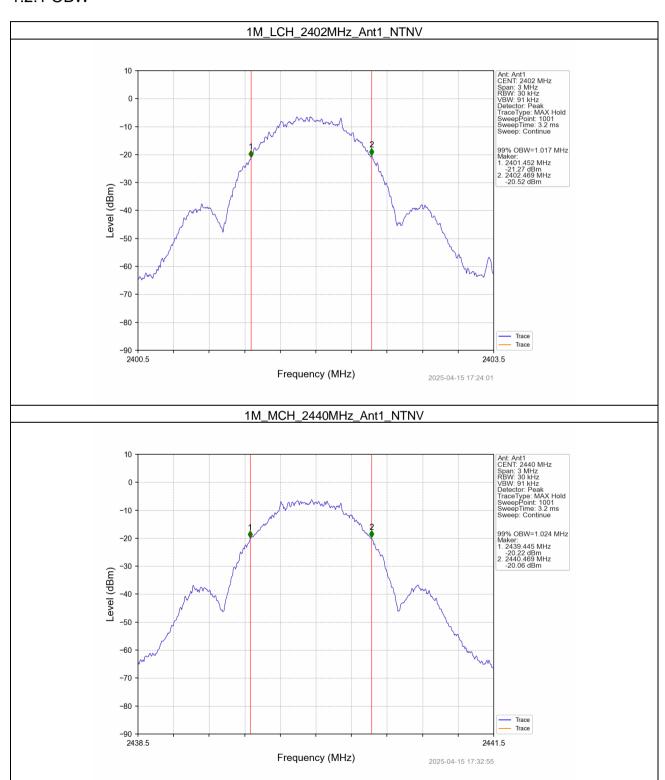
SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 45 of 67

1.2 Test Graph

1.2.1 OBW

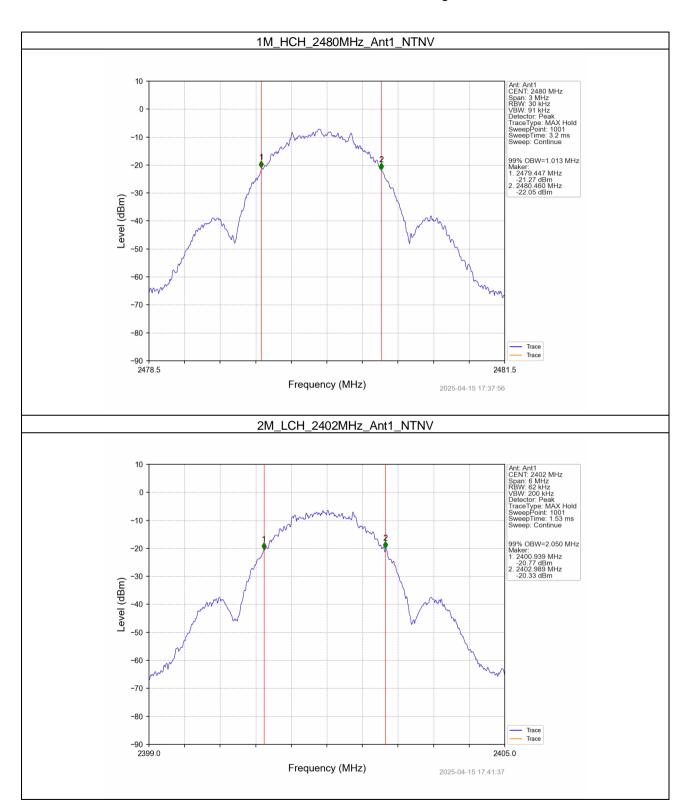




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 46 of 67

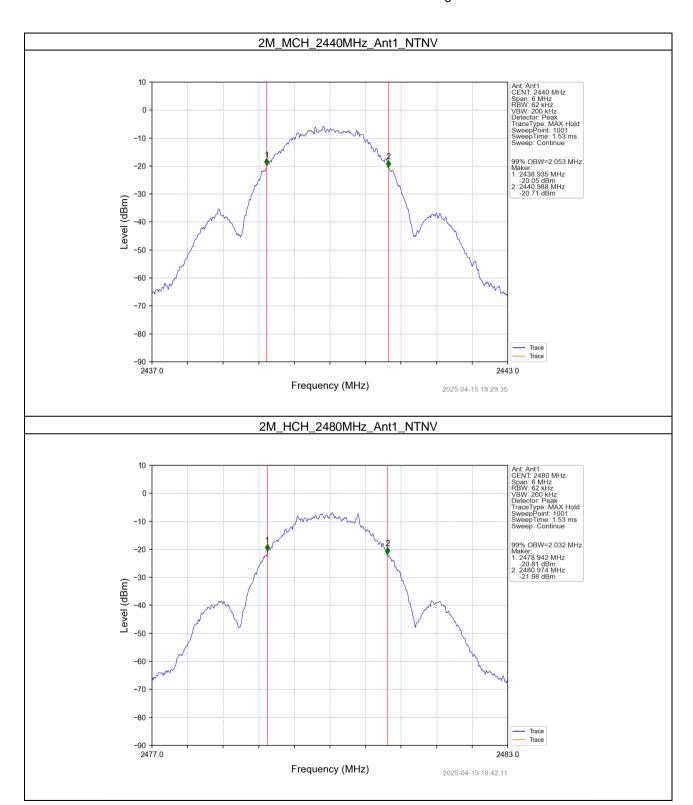




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 47 of 67



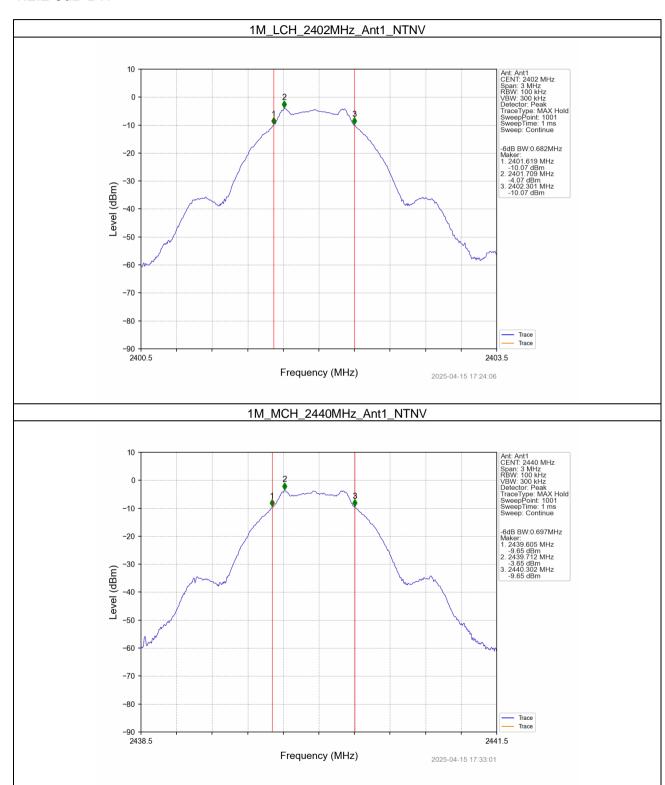


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 48 of 67

1.2.2 6dB BW

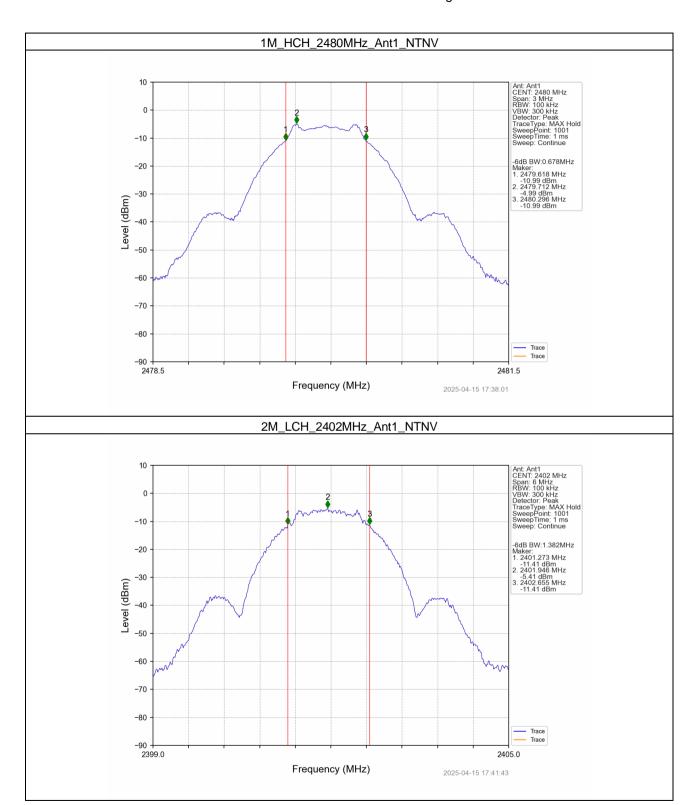




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 49 of 67

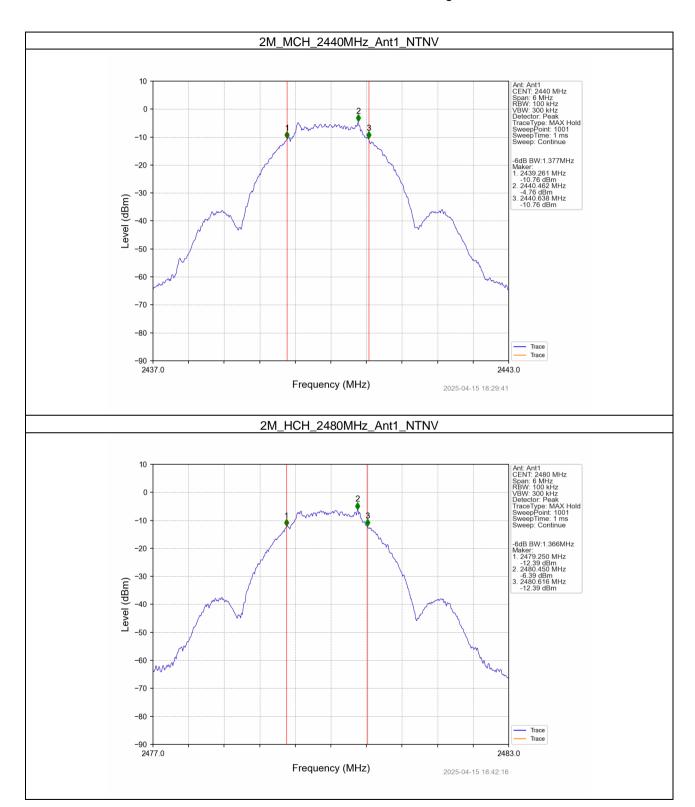




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 50 of 67





SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601

Page: 51 of 67

2. Maximum Conducted Output Power

2.1 Test Result

2.1.1 Power

Mode TX Type	TX	Frequency	Maximum Peak Conduc	\	
	Type	(MHz)	ANT1	Limit	Verdict
1M SISO		2402	-3.83	<=30	Pass
	SISO	2440	-3.41	<=30	Pass
		2480	-4.82	<=30	Pass
2M SISC		2402	-3.81	<=30	Pass
	SISO	2440	-3.30	<=30	Pass
		2480	-4.70	<=30	Pass

2.1.2 EIRP

Mode	TX	Frequency	E.I.R.f	\/aval:at	
Mode	Type	(MHz)	ANT1	Limit	Verdict
		2402	-3.83	<=36.02	Pass
1M	SISO	2440	-3.41	<=36.02	Pass
		2480	-4.82	<=36.02	Pass
		2402	-3.81	<=36.02	Pass
2M	SISO	2440	-3.30	<=36.02	Pass
		2480	-4.70	<=36.02	Pass

Note1: Antenna Gain: Ant1: 0.00dBi;

Note2: E.I.R.P = Measured Power + Antenna Gain



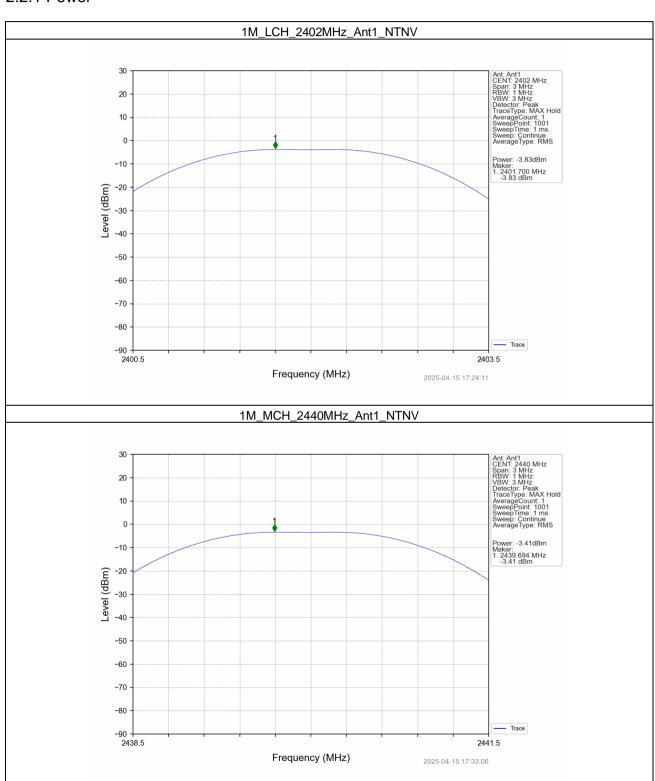
SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 52 of 67

2.2 Test Graph

2.2.1 Power

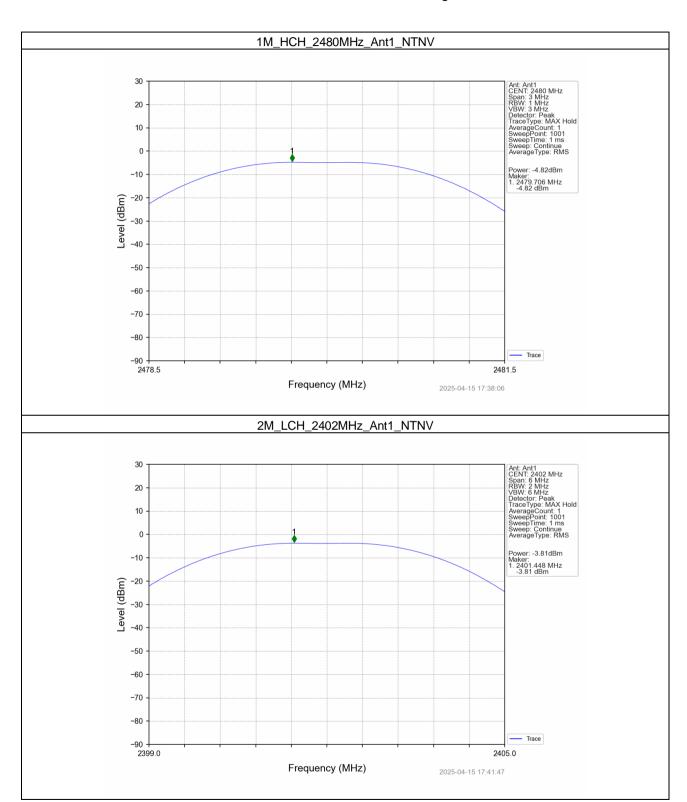




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 53 of 67

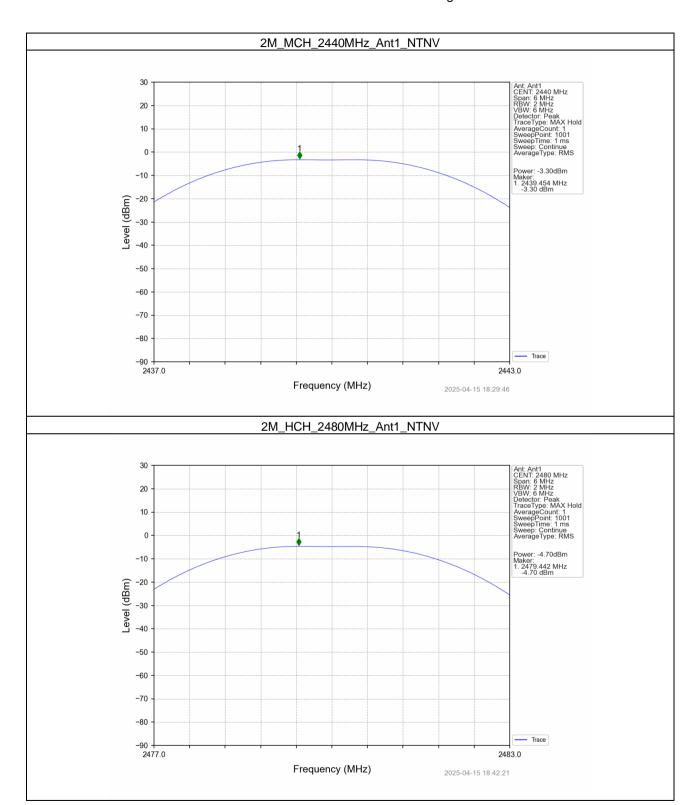




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 54 of 67





SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. SHEM-TRF-001 Rev. 02 Sep01, 2023 Report No.: SHCR25040

Report No.: SHCR250400085601 Page: 55 of 67

3. Maximum Power Spectral Density

3.1 Test Result

3.1.1 PSD

Mode	TX	Frequency	Maximum PS	Verdict	
iviode	Type	(MHz)	ANT1	Limit	verdict
		2402	-14.49	<=8	Pass
1M	SISO	2440	-13.01	<=8	Pass
		2480	-13.95	<=8	Pass
		2402	-17.36	<=8	Pass
2M	SISO	2440	-16.68	<=8	Pass
		2480	-17.22	<=8	Pass
Note1: Antenna	Gain: Ant1: 0.000	dBi;			



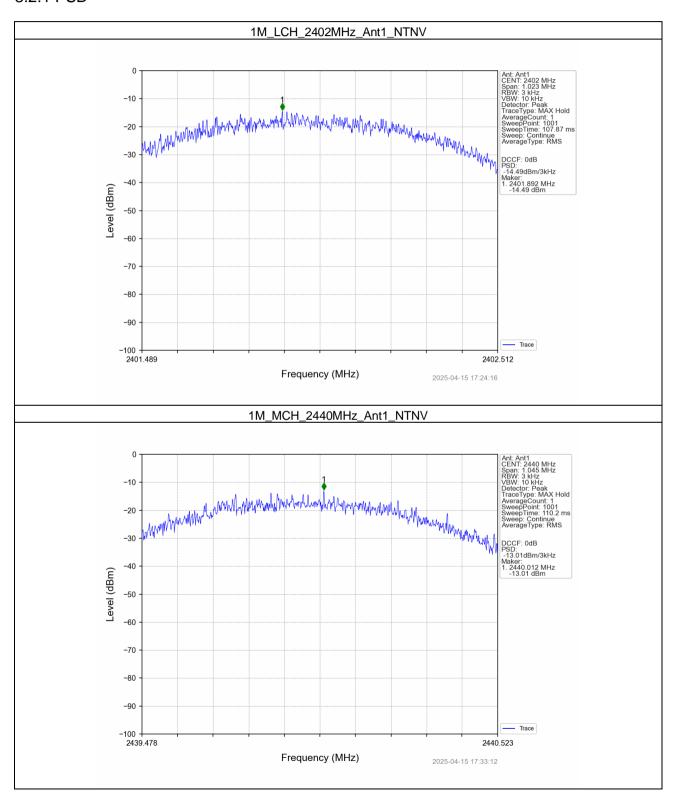
SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 56 of 67

3.2 Test Graph

3.2.1 PSD

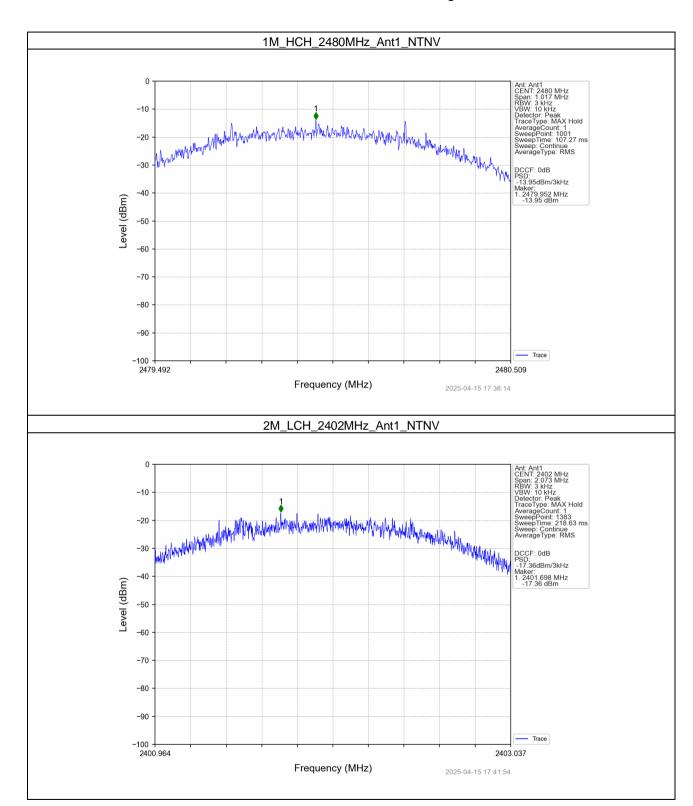




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 57 of 67

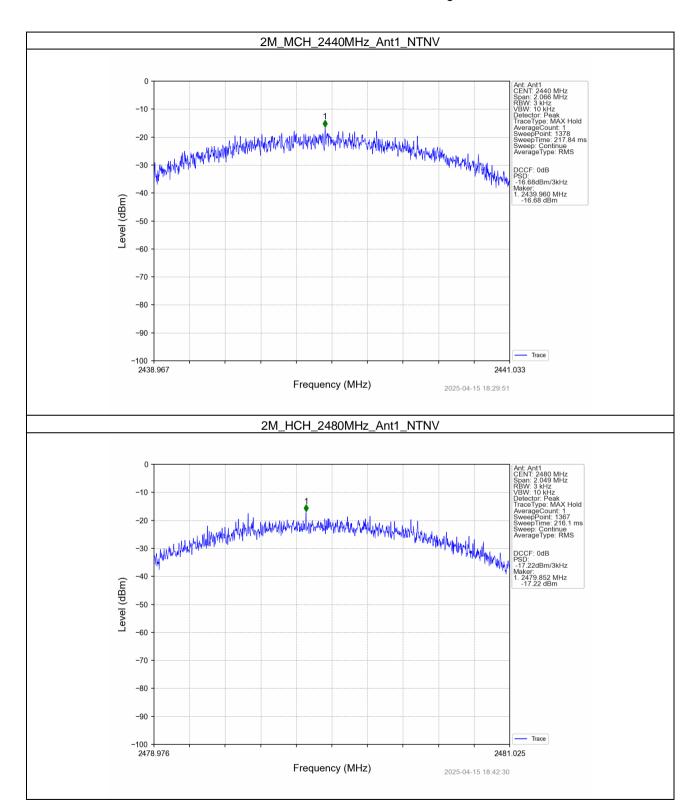




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 58 of 67





SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 59 of 67

4. Unwanted Emissions In Non-restricted Frequency Bands

4.1 Test Result

4.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	
1M	SISO	2402	1	-3.91	
		2440	1	-3.57	
		2480	1	-4.98	
2M	SISO	2402	1	-5.21	
		2440	1	-5.01	
		2480	1	-6.20	

Note1: Refer to RSS-247 Issue 3 section 5.5 and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

4.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	-3.57	-23.57	Pass
		2440	1	-3.57	-23.57	Pass
		2480	1	-3.57	-23.57	Pass
2M	SISO	2402	1	-5.01	-25.01	Pass
		2440	1	-5.01	-25.01	Pass
		2480	1	-5.01	-25.01	Pass

Note1: Refer to RSS-247 Issue 3 section 5.5 and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.



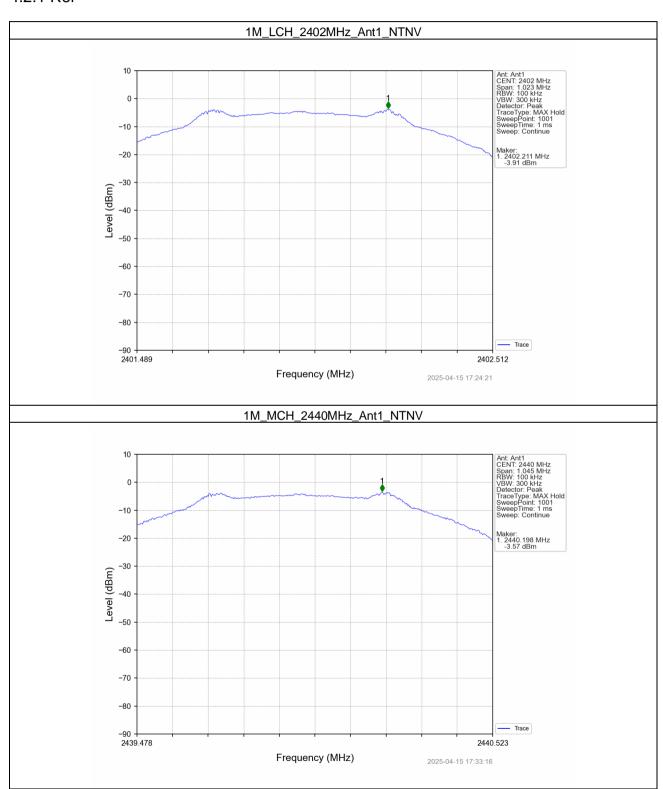
SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 60 of 67

4.2 Test Graph

4.2.1 Ref

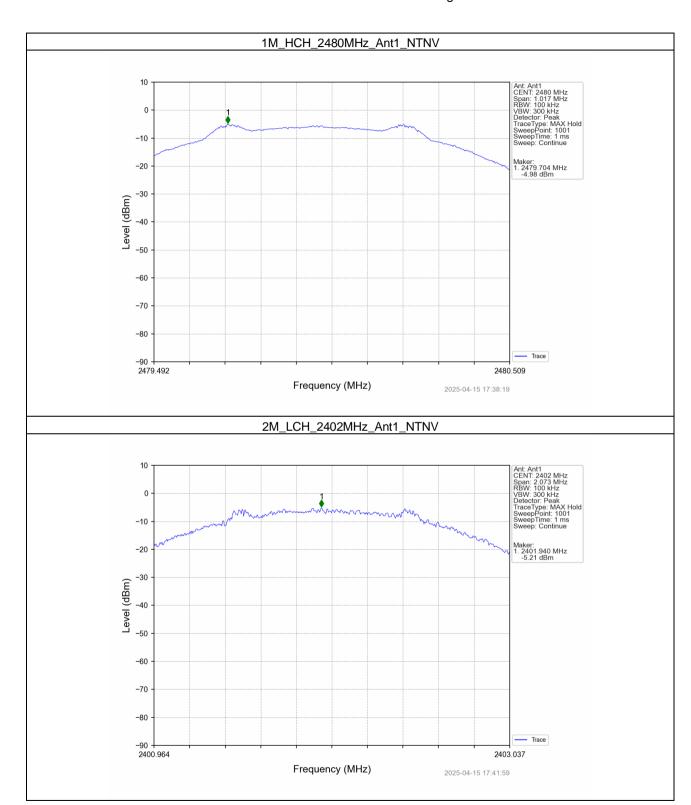




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 61 of 67

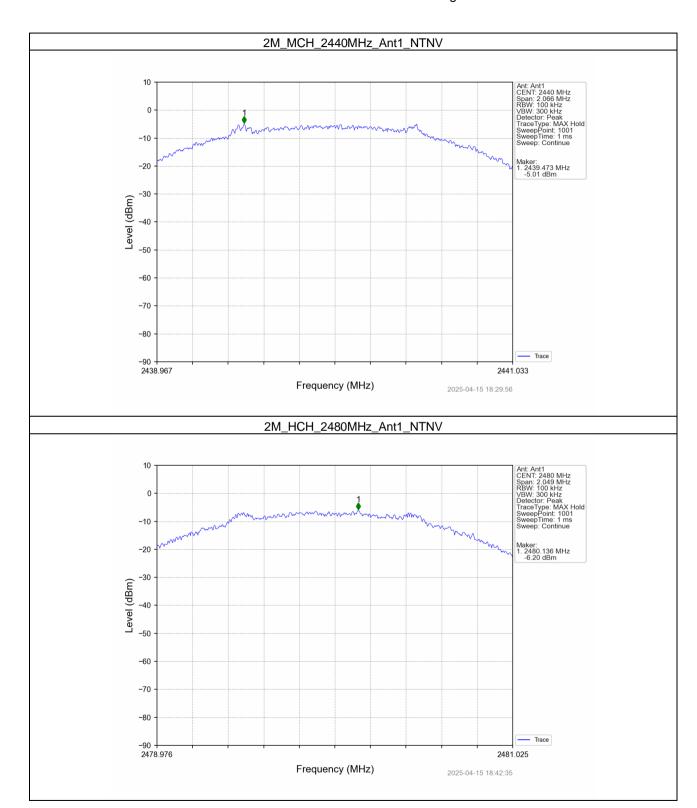




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 62 of 67



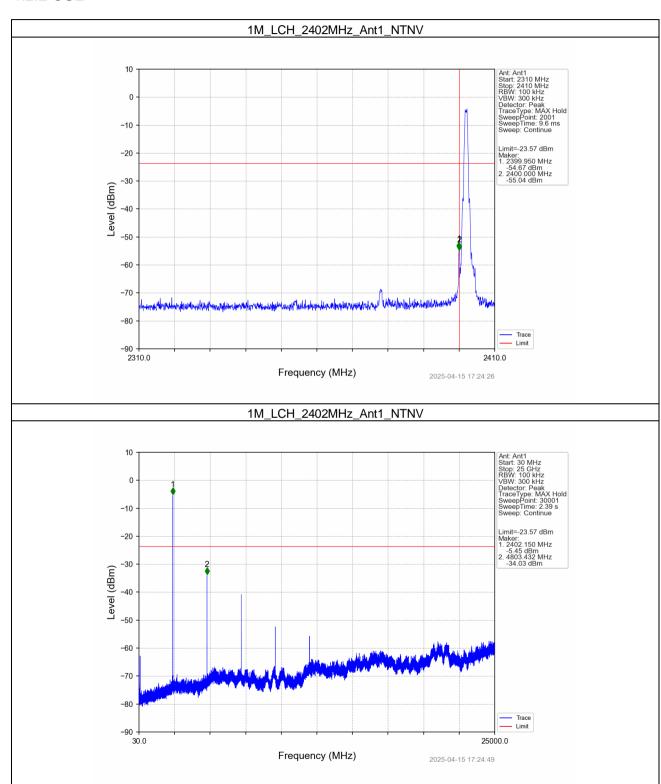


SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 63 of 67

4.2.2 CSE

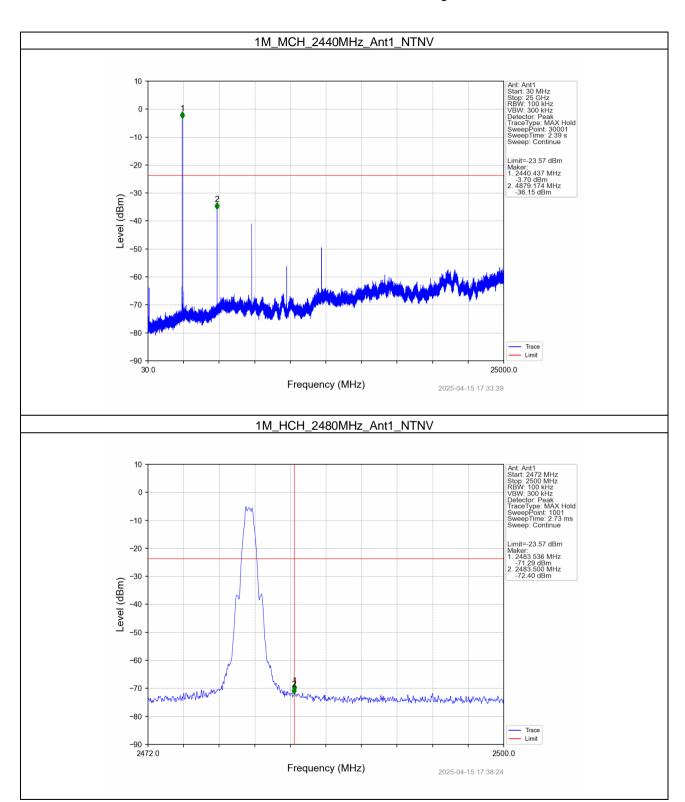




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 64 of 67

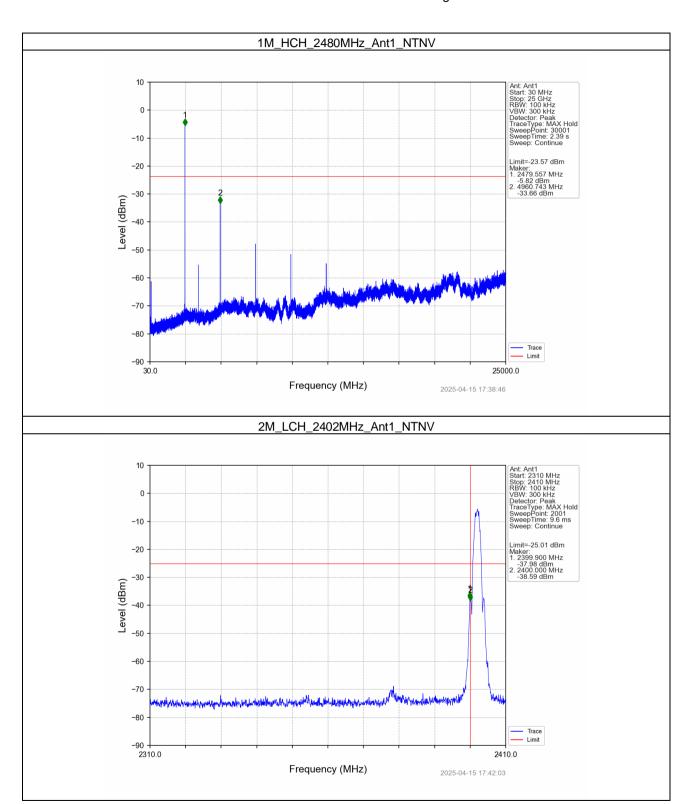




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 65 of 67

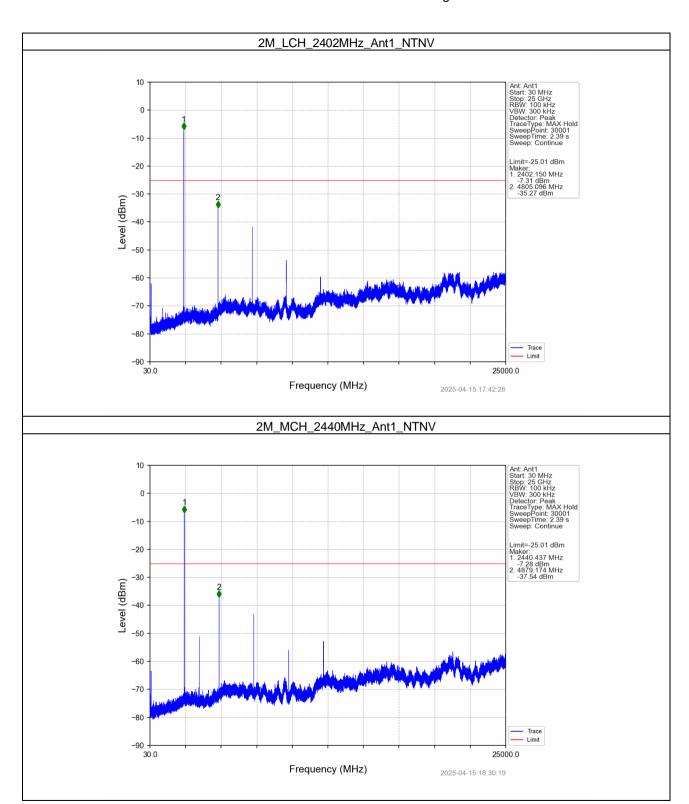




SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 66 of 67





SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250400085601

Page: 67 of 67

