

SZEMC-TRF-01 Rev. A/0 Aug01,2022

Report No.: SZCR230300062601

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TEST REPORT

Application No.: SZCR2303000626AT **Applicant:** BM innovations GmbH

Address of Applicant: Mainburger Str. 3 Hoergertshausen 85413 Germany

Manufacturer: BM innovations GmbH

Address of Manufacturer: Mainburger Strasse 3, 85413 Hoergertshausen, Germany

Equipment Under Test (EUT):

EUT Name: BLE RF Module

Model No.: BM-SP10, BM-SP11

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

actual tested and which were electrically identical.

FCC ID: WRO-BM-MM10

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

Date of Receipt: 2023-03-10

Date of Test: 2023-03-13 to 2023-03-21

Date of Issue: 2023-03-23

Test Result: Pass*

Keny Xu EMC Laboratory Manager



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



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	Revision Record							
Version	Chapter	Date	Modifier	Remark				
01		2023-03-23		Original				

Authorized for issue by:			
	(eo.li		
	Leo Li/Project Engineer	_	
	Exic Fu		
	Eric Fu/Reviewer	-	



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2 **Test Summary**

Radio Spectrum Technical Requirement						
Item Standard Method Requirement Result						
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass		

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass		
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass		
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass		
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		

Declaration of EUT Family Grouping:

Model No.: BM-SP10, BM-SP11

Only the model BM-SP11 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on model No., dimension and the battery type. BM-SP10 use the CR2032 button cell; BM-SP11 use the CR2450 button cell. The difference between the two types of batteries is that they have different sizes and the voltage output is the same.



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General Information

Details of E.U.T.

Power supply:	3V DC(3V x 1 "CR2032" Button Cell)
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.2 LE
Data Rate:	1M/bps & 2M/bps
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-1.62dBi

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.			
		-				
The EUT has been tested as an independent unit.						

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Peak Output Power	± 0.75dB
Minimum 6dB Bandwidth	± 3%
Power Spectrum Density	± 2.84dB
Conducted Band Edges Measurement	± 0.75dB
Conducted Spurious Emissions	± 0.75dB
Radiated Emissions which fall in the restricted bands	± 4.5dB (Below 1GHz);± 4.8dB (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	± 4.5dB
Radiated Spurious Emissions Above 1GHz	± 4.8dB
<u> </u>	

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr/ETSI} (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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Equipment List 5

Conducted Peak Output Power						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2022-10-20	2023-10-19	
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2022-03-23	2023-03-22	
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-01	2022-07-08	2023-07-07	
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2022-04-07	2023-04-06	

Minimum 6dB Bandwidth						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2022-10-20	2023-10-19	
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2022-03-23	2023-03-22	
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-01	2022-07-08	2023-07-07	
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2022-04-07	2023-04-06	

Power Spectrum Density						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2022-10-20	2023-10-19	
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2022-03-23	2023-03-22	
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-01	2022-07-08	2023-07-07	
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2022-04-07	2023-04-06	

Conducted Band Edges Measurement						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2022-10-20	2023-10-19	
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2022-03-23	2023-03-22	
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-01	2022-07-08 2023-07-		
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2022-04-07	2023-04-06	



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Conducted Spurious Emissions						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
DC Power Supply	C Power Supply Chroma		SEM011-11	2022-10-20	2023-10-19	
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2022-03-23	2023-03-22	
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A	
Coaxial Cable SGS		N/A	SEM031-01	2022-07-08	2023-07-07	
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2022-04-07	2023-04-06	

Radiated Emissions which fall in the restricted bands						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2022-04-02	2025-04-01	
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2022-03-23	2023-03-22	
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2022-07-24	2024-07-23	
Microwave system amplifier	Agilent	83017A	SEM005-25	2022-09-21	2023-09-20	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM026-01	2022-07-08	2023-07-07	
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2022-08-10	2024-08-09	
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2022-03-22	2023-03-21	



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Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2022-08-13	2023-08-12
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2022-10-20	2023-10-19
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2021-09-17	2023-09-16
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2022-03-22	2023-03-21
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2022-07-08	2023-07-07

Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2022-04-02	2025-04-01
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2022-03-23	2023-03-22
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2022-07-24	2024-07-23
Microwave system amplifier	Agilent	83017A	SEM005-25	2022-09-21	2023-09-20
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2022-07-08	2023-07-07

General used equipment						
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date	
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2022-09-04	2023-09-03	
Humidity/ Temperature Indicator	Anymetre	TH101B	SEM002-09	2022-09-04	2023-09-03	
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2022-03-28	2023-03-27	



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Radio Spectrum Technical Requirement 6

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 -1.62 dBi.

Antenna location: Refer to internal photo.



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Radio Spectrum Matter Test Results 7

7.1 Conducted Peak Output Power

47 CFR Part 15, Subpart C 15.247(b)(3) Test Requirement 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





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7.1.1 E.U.T. Operation

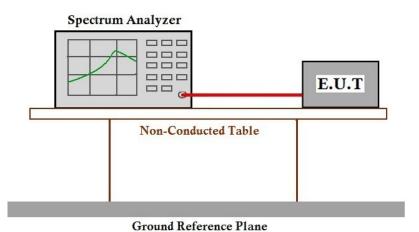
Operating Environment:

Temperature: 23.0 °C Humidity: 43.6 % RH Atmospheric Pressure: 1015 mbar

7.1.2 Test Mode Description

7.11.2 Test mode besomption					
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.			

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

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

Please Refer to Appendix for Details



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7.2 Minimum 6dB Bandwidth

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

Limit: ≥500 kHz

7.2.1 E.U.T. Operation

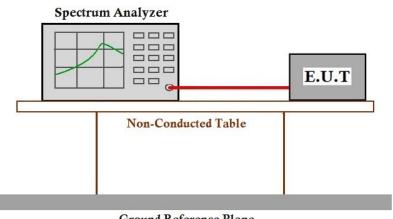
Operating Environment:

Temperature: 23.0 °C Humidity: 43.6 % RH Atmospheric Pressure: 1015 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.		
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.		

7.2.3 Test Setup Diagram



Ground Reference Plane

7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.3 Power Spectrum Density

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

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

7.3.1 E.U.T. Operation

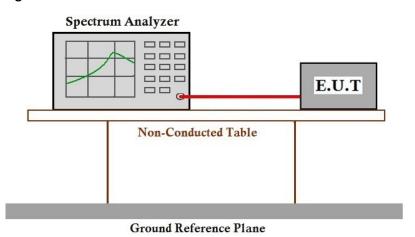
Operating Environment:

Temperature: 23.0 °C Humidity: 43.6 % RH Atmospheric Pressure: 1015 mbar

7.3.2 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.		

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.4 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).

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 43.6 % RH Atmospheric Pressure: 1015 mbar

7.4.2 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.



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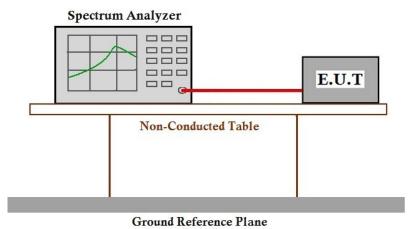


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7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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7.5 Conducted Spurious Emissions

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

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).

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 43.6 % RH Atmospheric Pressure: 1015 mbar

7.5.2 Test Mode Description

	The state was a state of the st				
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.			



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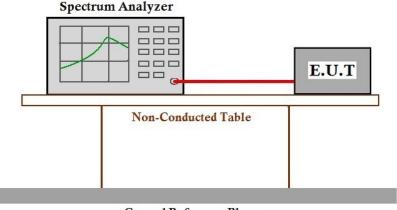


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7.5.3 Test Setup Diagram



Ground Reference Plane

7.5.4 Measurement Procedure and Data

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7.6 Radiated Emissions which fall in the restricted bands

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

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

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
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.



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7.6.1 E.U.T. Operation

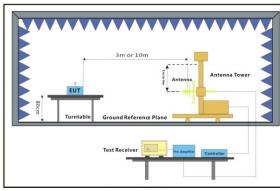
Operating Environment:

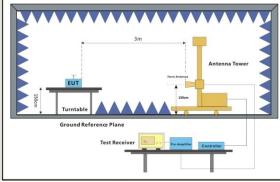
Temperature: 22.7 °C Humidity: 64.8 % RH Atmospheric Pressure: 1015 mbar

7.6.2 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.

7.6.3 Test Setup Diagram





30MHz-1GHz Above 1GHz



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7.6.4 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
- 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.



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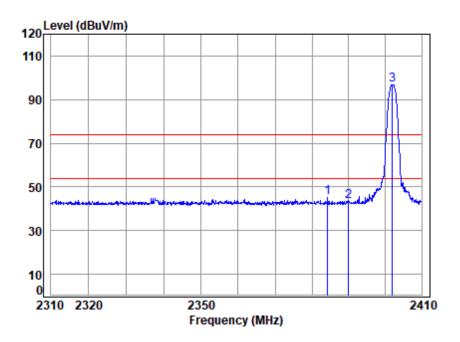


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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



: chamber Site

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2402 Band edge

Note : BLE

> 1 2

		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		_
							•			
	2384.298	4.24	28.74	35.64	47.74	45.08	74.00	-28.92	peak	
	2390.000	4.25	28.76	35.64	45.81	43.18	74.00	-30.82	peak	
,	. 2402.000	4.26	28.81	35.64	99.23	96.66	74.00	22.66	peak	



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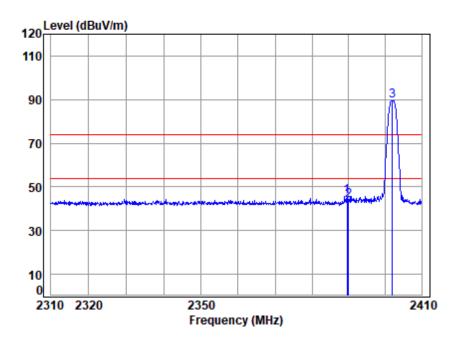


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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber

Condition: 3m VERTICAL

Job No : 00626AT\00627AT Mode : 2402 Band edge

Note : BLE

		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2389.558	4.25	28.76	35.64	48.34	45.71	74.00	-28.29	peak	
2	2390.000	4.25	28.76	35.64	46.35	43.72	74.00	-30.28	peak	
3	. 2402.000	4.26	28.81	35.64	92.15	89.58	74.00	15.58	peak	



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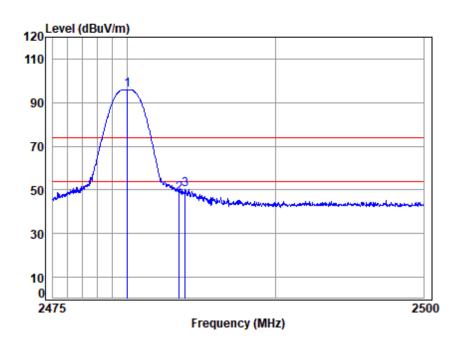


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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2480 Band edge

Note : BLE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1.	2480.000	4.34	29.28	35.61	97.93	95.94	74.00	21.94	peak
2	2483.500	4.34	29.30	35.61	50.37	48.40	74.00	-25.60	peak
3	2483.896	4.34	29.30	35.61	52.16	50.19	74.00	-23.81	peak



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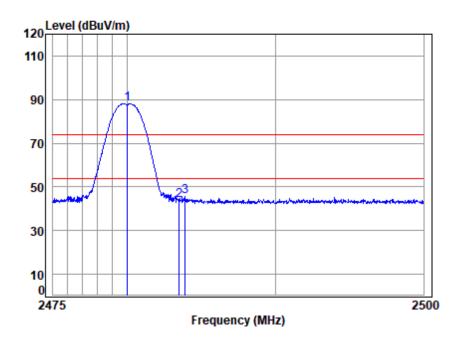


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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m VERTICAL

Job No : 00626AT\00627AT Mode : 2480 Band edge

Note : BLE

> 1 2 3

		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
										_
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
	. 2480.000	4.34	29.28	35.61	89.95	87.96	74.00	13.96	peak	
)	2483.500	4.34	29.30	35.61	45.86	43.89	74.00	-30.11	peak	
;	2483.896	4.34	29.30	35.61	47.63	45.66	74.00	-28.34	peak	



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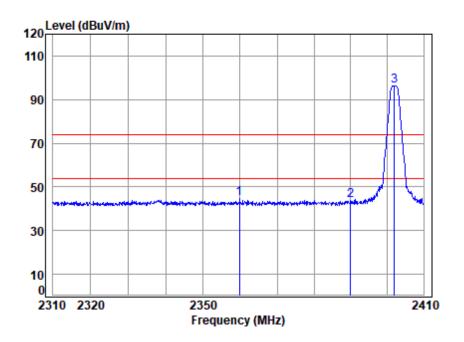


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2402 Band edge

Note : BLE

		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2359.870	4.22	28.64	35.65	47.46	44.67	74.00	-29.33	peak	
2	2390.000	4.25	28.76	35.64	46.26	43.63	74.00	-30.37	peak	
3	. 2402.000	4.26	28.81	35.64	98.98	96.41	74.00	22.41	peak	



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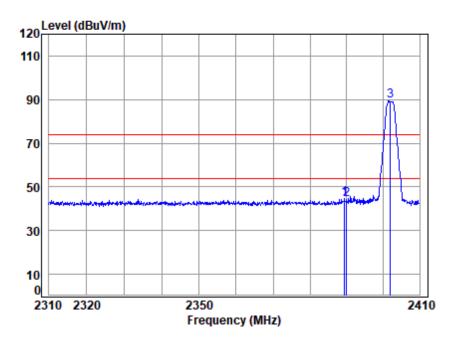


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber

Condition: 3m VERTICAL

Job No : 00626AT\00627AT Mode : 2402 Band edge

Note : BLE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.356	4.25	28.76	35.64	47.53	44.90	74.00	-29.10	peak
2	2390.000	4.25	28.76	35.64	46.70	44.07	74.00	-29.93	peak
3	. 2402.000	4.26	28.81	35.64	91.79	89.22	74.00	15.22	peak



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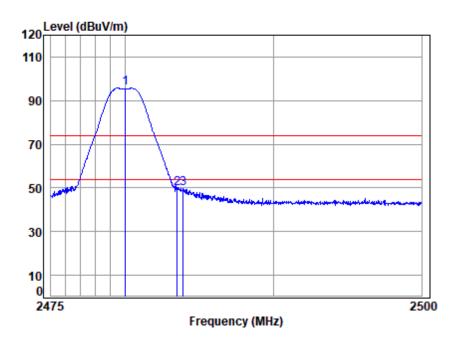


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2480 Band edge

Note : BLE

		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2480.000	4.34	29.28	35.61	97.74	95.75	74.00	21.75	peak
2		2483.500	4.34	29.30	35.61	51.61	49.64	74.00	-24.36	peak
3		2483.896	4.34	29.30	35.61	51.61	49.64	74.00	-24.36	peak



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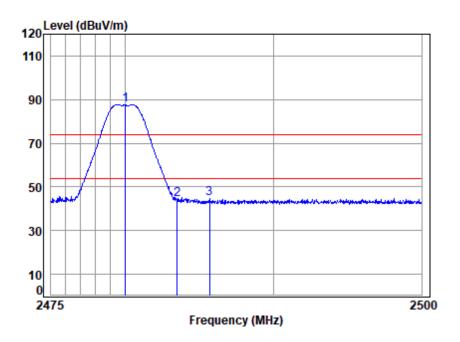


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m VERTICAL

Job No : 00626AT\00627AT Mode : 2480 Band edge

Note : BLE

		Freq			Preamp Factor					Remark
	-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2480.000	4.34	29.28	35.61	89.75	87.76	74.00	13.76	peak
2		2483.500	4.34	29.30	35.61	46.29	44.32	74.00	-29.68	peak
3		2485.669	4.35	29.31	35.61	46.69	44.74	74.00	-29.26	peak



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7.7 Radiated Spurious Emissions Below 1GHz

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

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

7.7.1 E.U.T. Operation

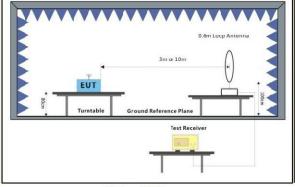
Operating Environment:

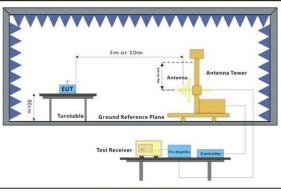
Temperature: 23.5 °C Humidity: 47.6 % RH Atmospheric Pressure: 1015 mbar

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





30MHz-1GHz



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7.7.4 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.
- 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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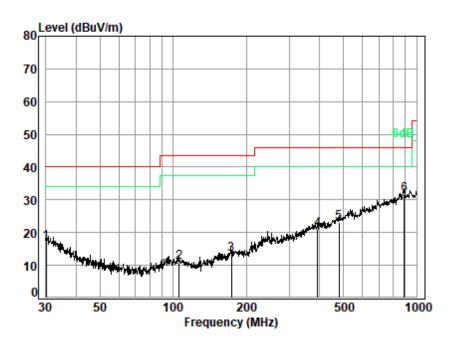


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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



: chamber Site

Condition: 3m HORIZONTAL

Job No. : 00626AT

Test Mode: 00

	Freq	Ant Factor		Preamp Factor					Remark
_	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.11	21.40	0.63	27.23	22.09	16.89	40.00	-23.11	QP
2	105.64	12.89	1.17	26.98	23.92	11.00	43.50	-32.50	QP
3	173.21	14.42	1.54	26.71	24.28	13.53	43.50	-29.97	QP
4	392.10	21.51	2.45	26.48	23.63	21.11	46.00	-24.89	QP
5	480.53	23.19	2.75	26.74	24.00	23.20	46.00	-22.80	QP
6 a	890 73	28 95	4 99	25 94	24 48	31 49	46 99	-14 51	OP



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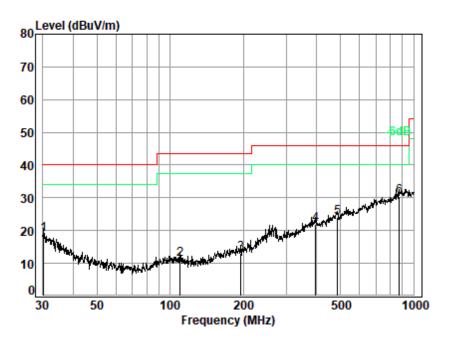


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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber Condition: 3m VERTICAL : 00626AT

Test Mode: 00

Job No.

	Freq		Cable Preamp Loss Factor						
_	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.21	21.33	0.63	27.23	24.02	18.75	40.00	-21.25	QP
2	109.80	12.55	1.19	26.96	24.60	11.38	43.50	-32.12	QP
3	195.14	14.48	1.66	26.62	23.60	13.12	43.50	-30.38	QP
4	396.24	21.65	2.47	26.49	24.41	22.04	46.00	-23.96	QP
5	487.32	22.99	2.77	26.76	24.99	23.99	46.00	-22.01	QP
6 a	875 25	28 20	3 94	26 00	24 36	30 50	46 99	-15 50	OP



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7.8 Radiated Spurious Emissions Above 1GHz

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

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

Limit:

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

7.8.1 E.U.T. Operation

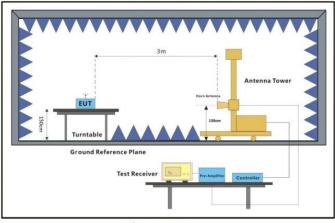
Operating Environment:

Temperature: 22.7 °C Humidity: 64.6 % RH Atmospheric Pressure: 1015 mbar

7.8.2 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.

7.8.3 Test Setup Diagram



Above 1GHz



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7.8.4 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.



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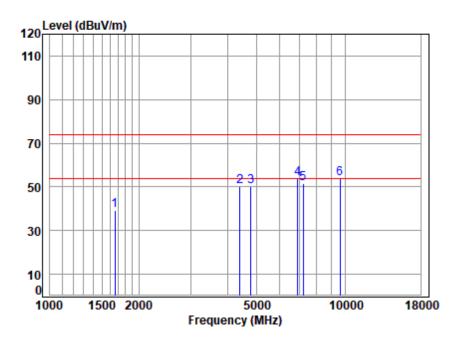


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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2402 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1663.137	3.45	26.73	36.48	45.56	39.26	74.00	-34.74	peak
2	4405.090	6.68	33.50	34.61	44.83	50.40	74.00	-23.60	peak
3	4804.000	7.04	33.82	34.86	44.01	50.01	74.00	-23.99	peak
4	6914.763	8.31	35.63	35.84	45.52	53.62	74.00	-20.38	peak
5	7206.000	8.52	35.80	35.95	43.33	51.70	74.00	-22.30	peak
6	9608 000	10 39	37 10	35 55	/11 71	53 65	7/ 00	-20 35	neak



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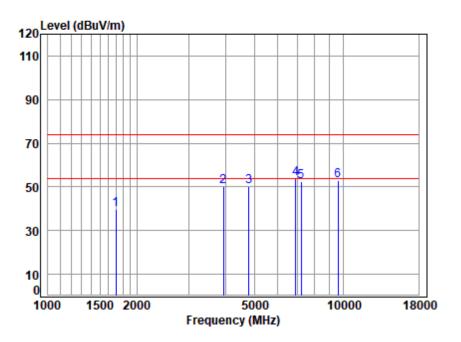


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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber

Condition: 3m VERTICAL
Job No : 00626AT\00627AT

Mode : 2402 TX RSE

: BLE

		_								
		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	1702.042	3.49	26.80	36.40	45.67	39.56	74.00	-34.44	peak	
2	3935.493	6.20	32.60	34.39	45.85	50.26	74.00	-23.74	peak	
3	4804.000	7.04	33.82	34.86	44.18	50.18	74.00	-23.82	peak	
4	6894.806	8.30	35.60	35.82	45.68	53.76	74.00	-20.24	peak	
5	7206.000	8.52	35.80	35.95	44.08	52.45	74.00	-21.55	peak	
6	9608 000	10 39	37 10	35 55	/11 12	53 06	7/ 00	-20 94	neak	



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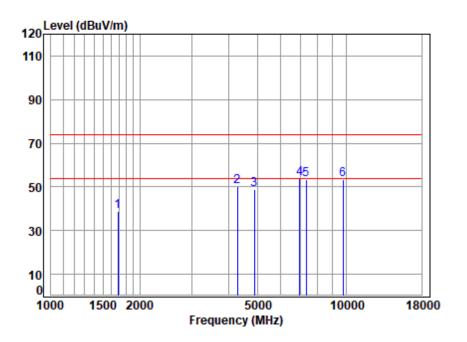


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Test Mode: 00; Polarity: Horizontal; Modulation: GFSK; Channel: middle



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2440 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	3.47	26.77	36.43	45.12	38.93	74.00	-35.07	peak
2	4279.589	6.56	33.60	34.53	44.74	50.37	74.00	-23.63	peak
3	4880.000	7.11	34.06	34.91	42.71	48.97	74.00	-25.03	peak
4	6954.852	8.31	35.71	35.87	45.79	53.94	74.00	-20.06	peak
5	7320.000	8.62	35.90	35.97	44.93	53.48	74.00	-20.52	peak
6	9760 000	10 /5	37 20	35 56	/11 20	53 29	7/ 00	-20 71	neak



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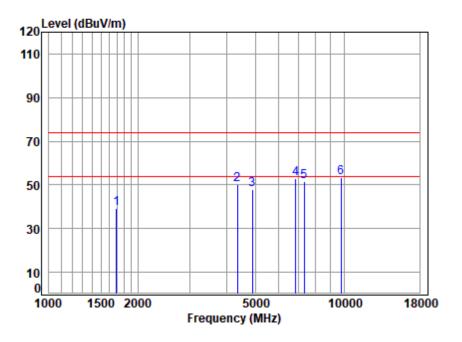


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Report No.: SZCR230300062601

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



Site : chamber Condition: 3m VERTICAL

Job No : 00626AT\00627AT

Mode : 2440 TX RSE

: BLE

		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	1692.231	3.48	26.78	36.42	45.51	39.35	74.00	-34.65	peak	
2	4354.454	6.63	33.59	34.58	44.75	50.39	74.00	-23.61	peak	
3	4880.000	7.11	34.06	34.91	41.83	48.09	74.00	-25.91	peak	
4	6855.063	8.30	35.60	35.79	45.01	53.12	74.00	-20.88	peak	
5	7320.000	8.62	35.90	35.97	43.03	51.58	74.00	-22.42	peak	
6	9760 000	10 45	37 20	35 56	41 40	53 49	74 99	-20 51	neak	



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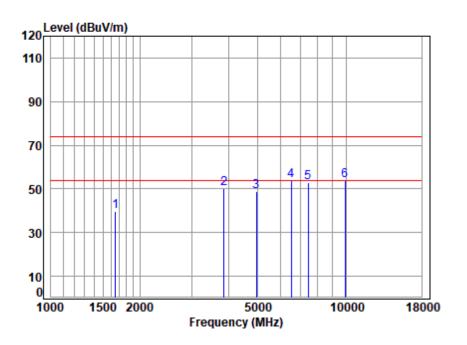


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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2480 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1653.550	3.43	26.71	36.51	46.06	39.69	74.00	-34.31	peak
2	3856.668	6.09	32.69	34.47	45.65	49.96	74.00	-24.04	peak
3	4960.000	7.18	34.22	34.96	42.32	48.76	74.00	-25.24	peak
4	6507.536	8.24	35.52	35.50	45.45	53.71	74.00	-20.29	peak
5	7440.000	8.73	35.90	35.99	44.20	52.84	74.00	-21.16	peak
6	9920 000	10 52	37 30	35 57	41 62	53 87	7/ 00	_20 13	neak



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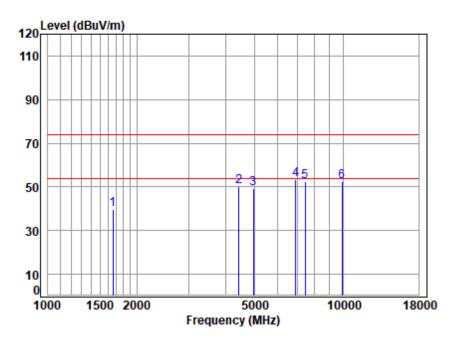


SZEMC-TRF-01 Rev. A/0 Aug01,2022

Report No.: SZCR230300062601

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



Site : chamber

Condition: 3m VERTICAL Job No : 00626AT\00627AT

Mode : 2480 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1663.137	3.45	26.73	36.48	45.87	39.57	74.00	-34.43	peak
2	4443.453	6.72	33.50	34.64	44.83	50.41	74.00	-23.59	peak
3	4960.000	7.18	34.22	34.96	42.92	49.36	74.00	-24.64	peak
4	6894.806	8.30	35.60	35.82	45.29	53.37	74.00	-20.63	peak
5	7440.000	8.73	35.90	35.99	43.73	52.37	74.00	-21.63	peak
6	9920 000	10 52	37 30	35 57	10 01	52 26	7/ 00	_21 7/	noak



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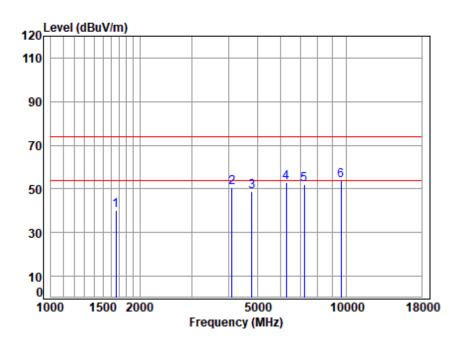


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Test Mode: 01; Polarity: Horizontal; Modulation: GFSK; Channel: Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2402 TX RSE

: BLE

		_							
	Frea			Preamp Factor					Remark
	MHz			dB					
							•		
1 2	1658.337 4109.872								•
3	4804.000								•
4	6267.553	8.21	35.20	35.29	45.00	53.12	74.00	-20.88	peak
5	7206.000	8.52	35.80	35.95	43.57	51.94	74.00	-22.06	peak
6	9608 000	10 39	37 10	35 55	/11 20	53 83	7/ 00	_20 17	noak



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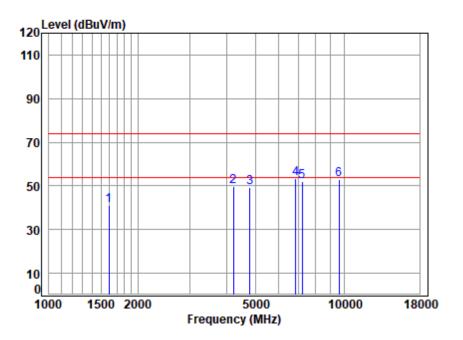


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Report No.: SZCR230300062601

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



Site : chamber

Condition: 3m VERTICAL
Job No : 00626AT\00627AT

Mode : 2402 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1597.181	3.37	26.47	36.64	47.90	41.10	74.00	-32.90	peak
2	4218.186	6.50	33.47	34.48	44.42	49.91	74.00	-24.09	peak
3	4804.000	7.04	33.82	34.86	43.50	49.50	74.00	-24.50	peak
4	6855.063	8.30	35.60	35.79	45.10	53.21	74.00	-20.79	peak
5	7206.000	8.52	35.80	35.95	43.82	52.19	74.00	-21.81	peak
6	9608 000	10 39	37 10	35 55	/11 19	53 13	7/ 00	-20 87	neak



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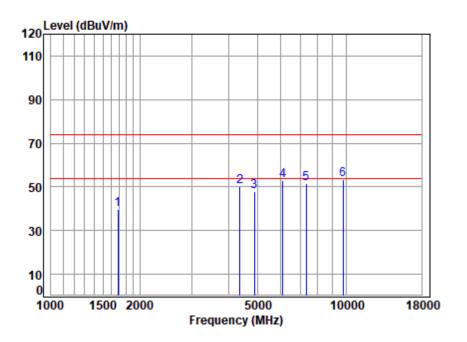


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Report No.: SZCR230300062601

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



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2440 TX RSE

: BLE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	3.47	26.77	36.43	45.77	39.58	74.00	-34.42	peak
2	4367.058	6.65	33.57	34.59	44.60	50.23	74.00	-23.77	peak
3	4880.000	7.11	34.06	34.91	41.64	47.90	74.00	-26.10	peak
4	6088.991	8.18	35.08	35.12	44.81	52.95	74.00	-21.05	peak
5	7320.000	8.62	35.90	35.97	43.18	51.73	74.00	-22.27	peak
6	9760 000	10 /5	37 20	35 56	/11 21	53 30	7/ 00	20 70	noak



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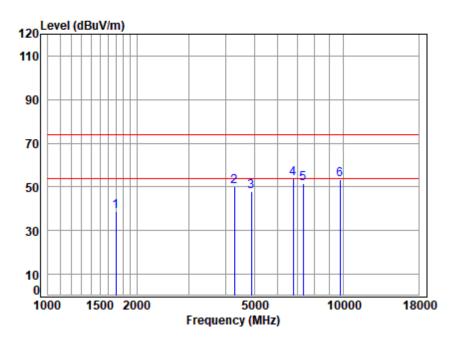


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Report No.: SZCR230300062601

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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle



Site : chamber

Condition: 3m VERTICAL Job No : 00626AT\00627AT

Mode : 2440 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1697.129	3.49	26.79	36.41	45.02	38.89	74.00	-35.11	peak
2	4279.589	6.56	33.60	34.53	44.38	50.01	74.00	-23.99	peak
3	4880.000	7.11	34.06	34.91	41.53	47.79	74.00	-26.21	peak
4	6776.265	8.29	35.50	35.73	45.73	53.79	74.00	-20.21	peak
5	7320.000	8.62	35.90	35.97	43.04	51.59	74.00	-22.41	peak
6	9760 000	10 /5	37 20	35 56	/11 37	53 //6	7/ 00	-20 54	neak



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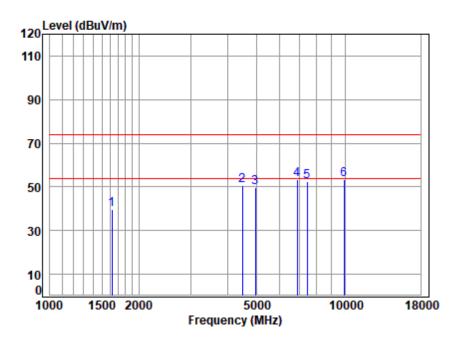


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Report No.: SZCR230300062601

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



Site : chamber

Condition: 3m HORIZONTAL Job No : 00626AT\00627AT Mode : 2480 TX RSE

: BLE

		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1620.431	3.39	26.58	36.58	46.09	39.48	74.00	-34.52	peak
2	4482.150	6.75	33.50	34.66	45.04	50.63	74.00	-23.37	peak
3	4960.000	7.18	34.22	34.96	43.12	49.56	74.00	-24.44	peak
4	6874.906	8.30	35.60	35.81	45.36	53.45	74.00	-20.55	peak
5	7440.000	8.73	35.90	35.99	43.83	52.47	74.00	-21.53	peak
6	9920 000	10 52	37 30	35 57	/11 15	53 //0	7/ 00	-20 60	neak



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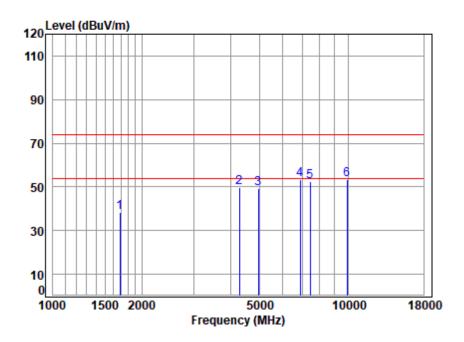


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Report No.: SZCR230300062601

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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber

Condition: 3m VERTICAL

Job No : 00626AT\00627AT

Mode : 2480 TX RSE

: BLE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	3.47	26.77	36.43	44.43	38.24	74.00	-35.76	peak
2	4291.977	6.57	33.60	34.54	44.27	49.90	74.00	-24.10	peak
3	4960.000	7.18	34.22	34.96	42.80	49.24	74.00	-24.76	peak
4	6874.906	8.30	35.60	35.81	45.26	53.35	74.00	-20.65	peak
5	7440.000	8.73	35.90	35.99	43.75	52.39	74.00	-21.61	peak
6	9920 000	10 52	37 30	35 57	/11 31	53 56	7/ 00	20 44	noak



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8 **Test Setup Photo**

Refer to Appendix - Test Setup Photo for SZCR2303000626AT

EUT Constructional Details (EUT Photos) 9

Refer to External and Internal Photos for SZCR2303000626AT



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10 Appendix

- 1. Duty Cycle
- 1.1 Ant1

1.1.1 Test Result

	Ant1								
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)		
	SISO	2402	0.392	1.251	31.33	5.04	0.12		
1M		2440	0.393	1.252	31.39	5.03	0.12		
		2480	0.392	1.251	31.33	5.04	0.12		
		2402	0.208	0.627	33.17	4.79	0.22		
2M	SISO	2440	0.208	0.625	33.28	4.78	0.04		
		2480	0.209	0.627	33.33	4.77	0.14		



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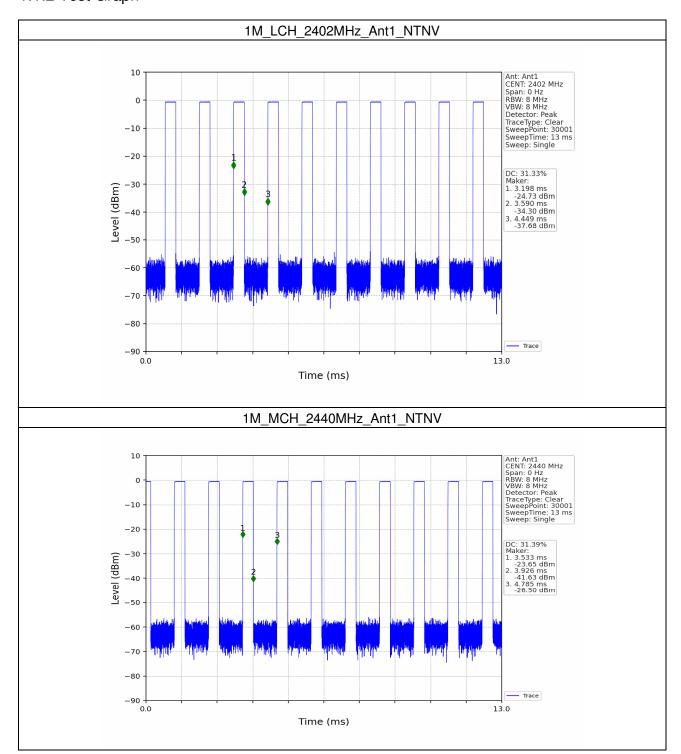


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1.1.2 Test Graph





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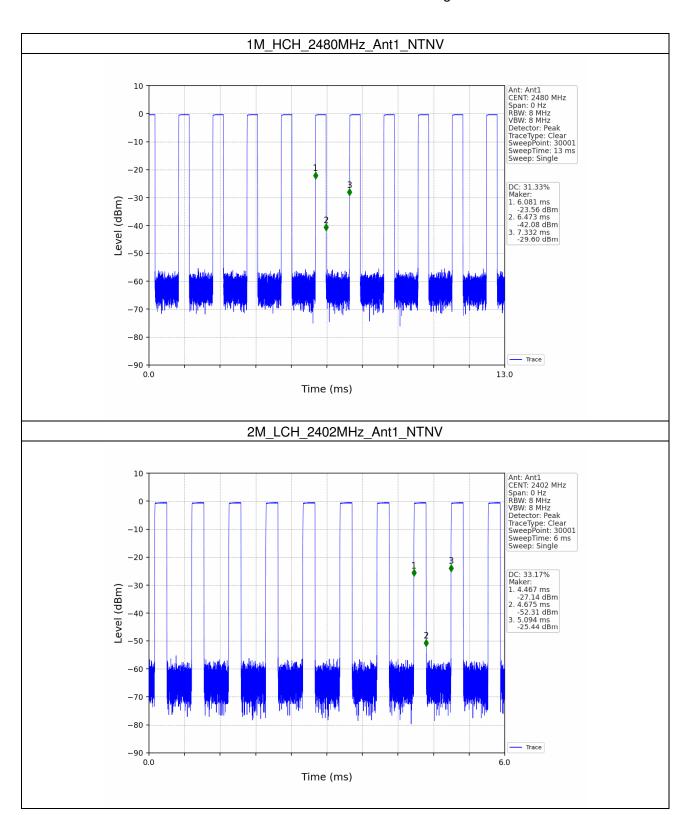
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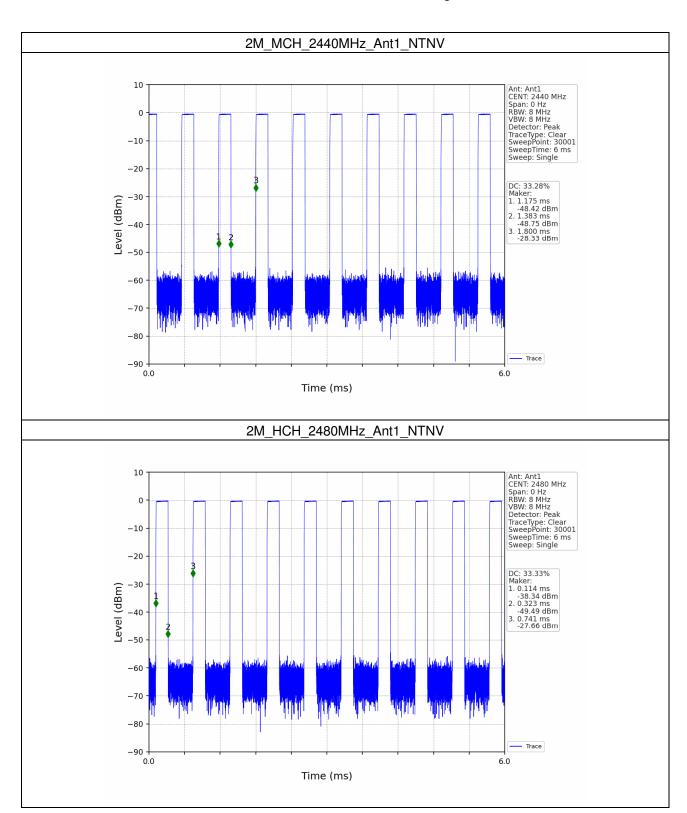
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2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mada	TX	Frequency (MHz)	ANIT	99% Occupied Bandwidth (MHz)	Vordict
Mode	Type		ANT	Result	Verdict
		2402	1	1.029	Pass
1M	SISO	2440	1	1.026	Pass
		2480	1	1.023	Pass
	SISO 2440 2480	1	2.067	Pass	
2M		2440	1	2.065	Pass
		2480	1	2.065	Pass



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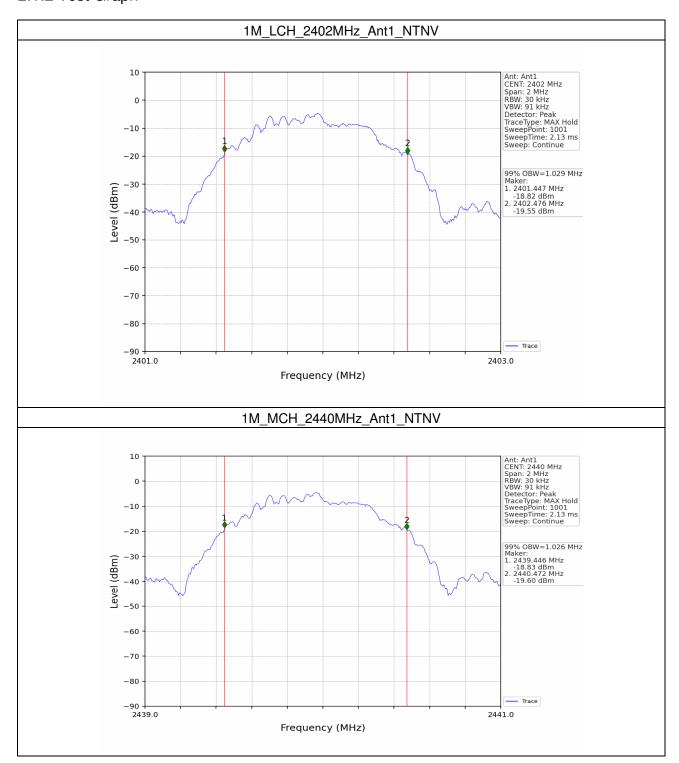


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2.1.2 Test Graph





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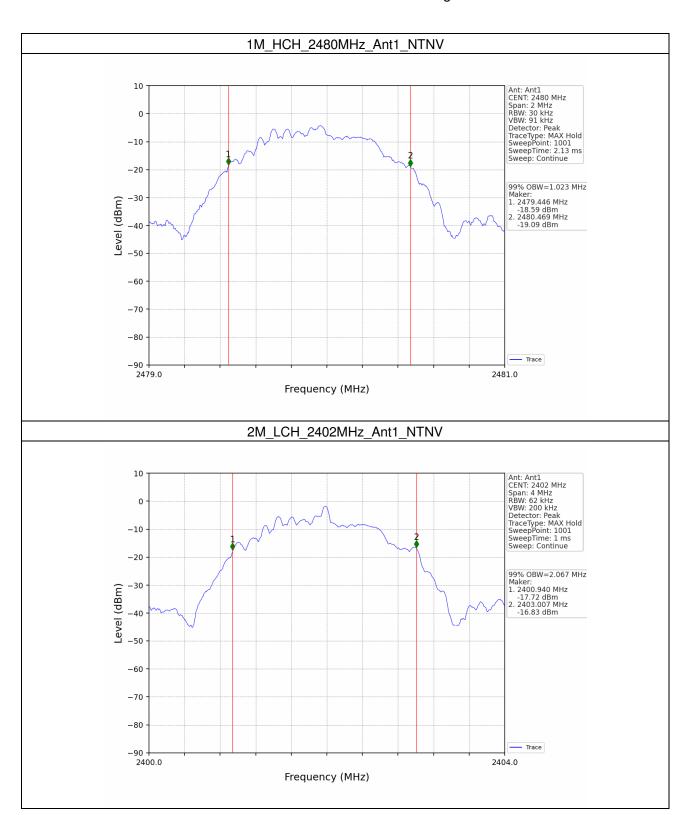
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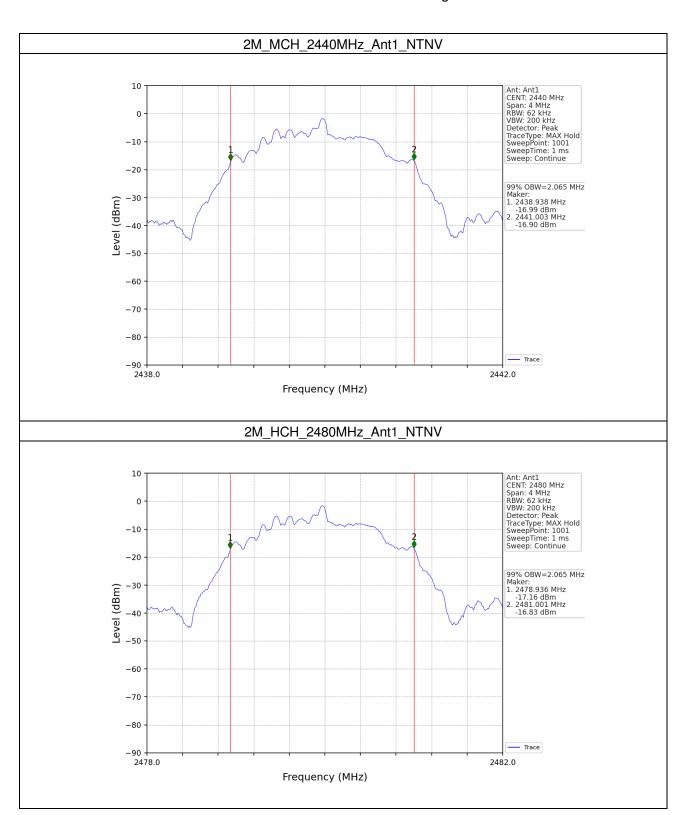
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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandv	Mandiat	
				Result	Limit	Verdict
	SISO	2402	1	0.667	>=0.5	Pass
1M		2440	1	0.668	>=0.5	Pass
		2480	1	0.672	>=0.5	Pass
	SISO	2402	1	1.146	>=0.5	Pass
2M		2440	1	1.145	>=0.5	Pass
		2480	1	1.144	>=0.5	Pass



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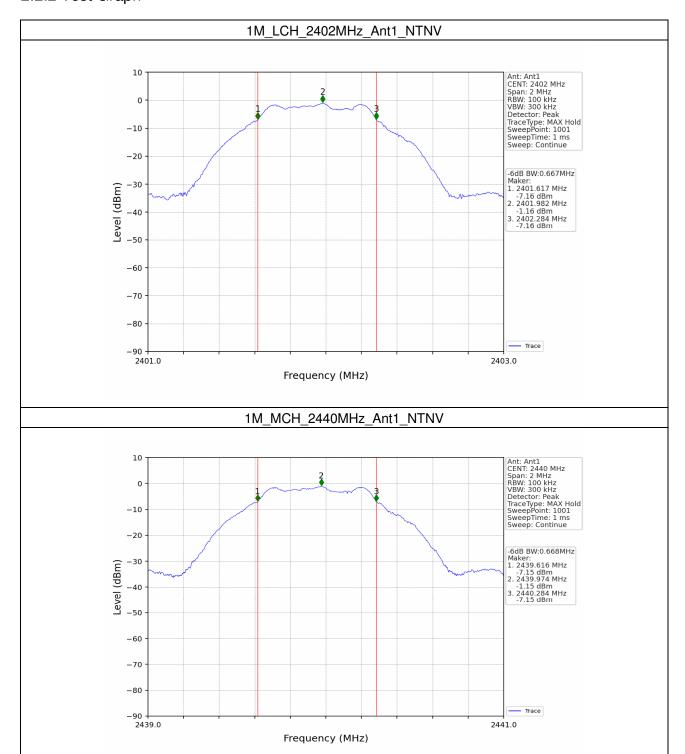


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2.2.2 Test Graph





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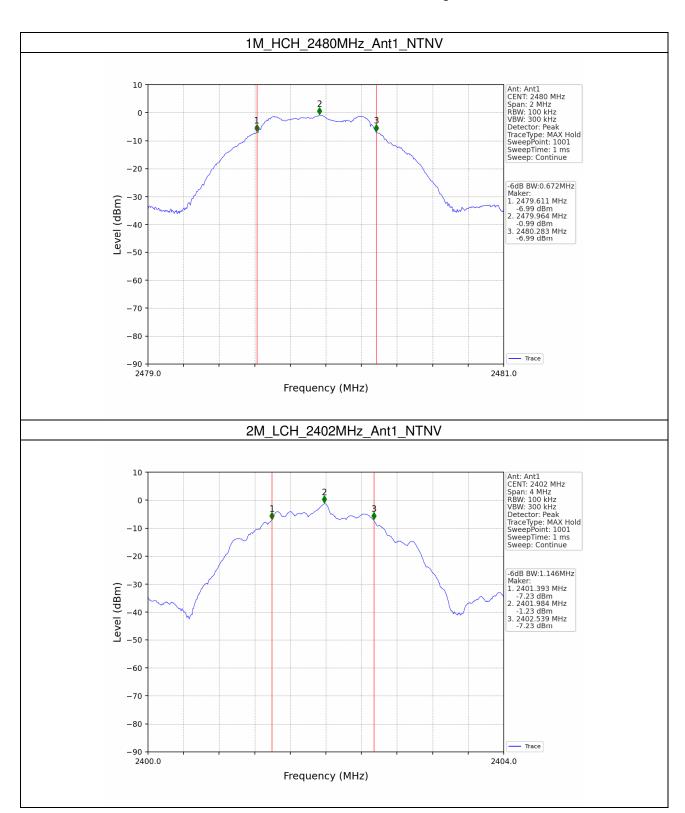
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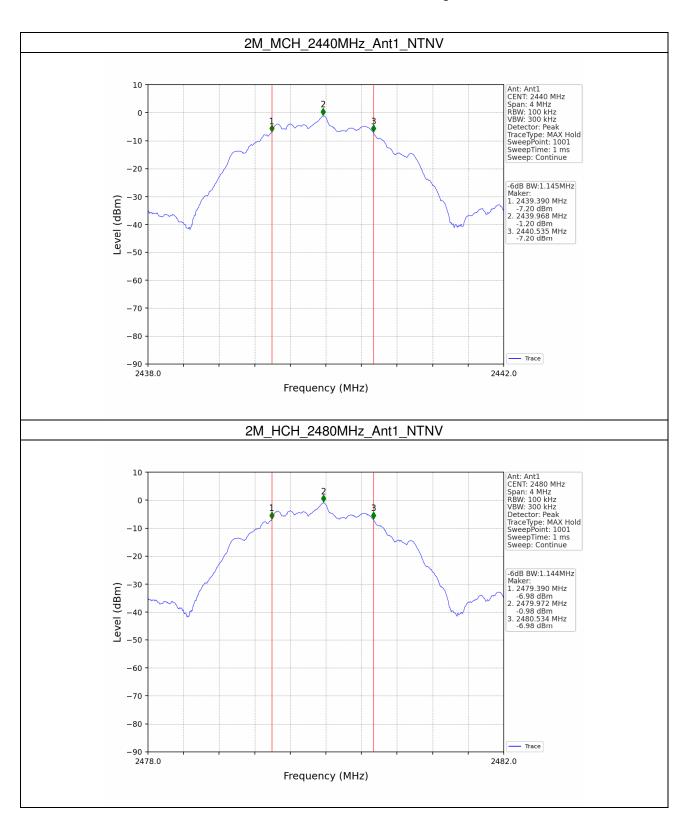
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3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX	Frequency (MHz)	Maximum Peak Conduc	Voudiet	
	Туре		ANT1	Limit	Verdict
		2402	-0.62	<=30	Pass
1M	SISO	2440	-0.55	<=30	Pass
		2480	-0.36	<=30	Pass
		2402	-0.60	<=30	Pass
2M	SISO	2440	-0.54	<=30	Pass
		2480	-0.36	<=30	Pass

4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PS	Verdict	
iviode			ANT1	Limit	verdict
		2402	-16.11	<=8	Pass
1M	SISO	2440	-16.15	<=8	Pass
		2480	-15.87	<=8	Pass
	SISO	2402	-18.95	<=8	Pass
2M		2440	-19.04	<=8	Pass
		2480	-18.66	<=8	Pass



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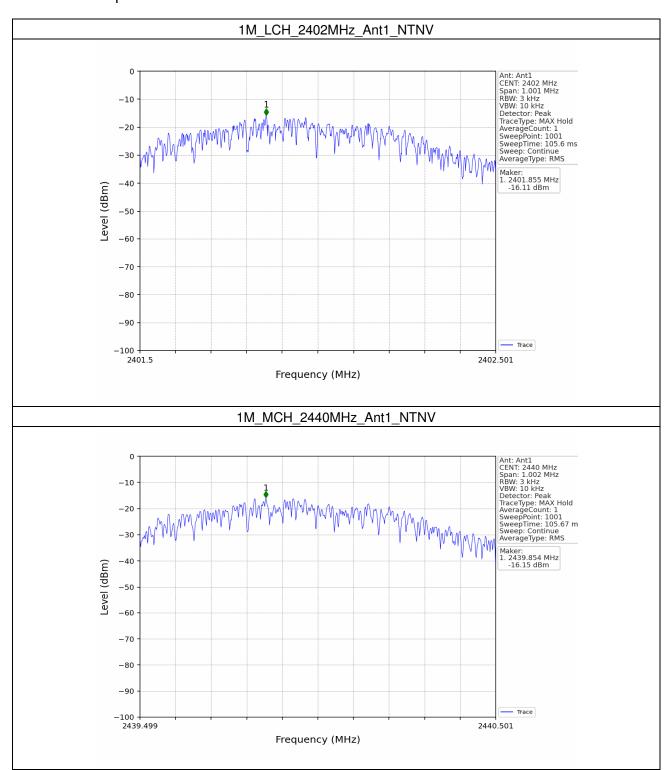


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4.1.2 Test Graph





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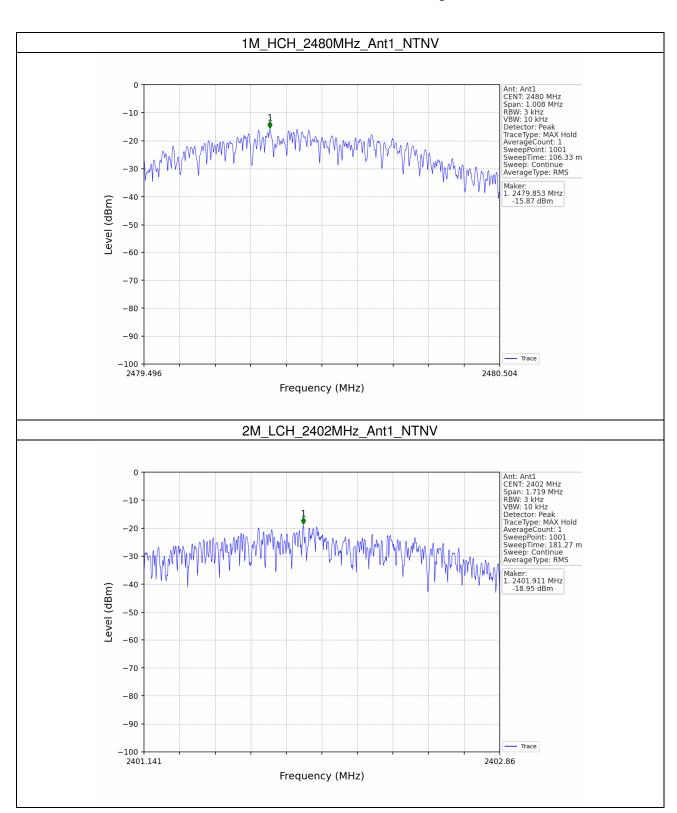
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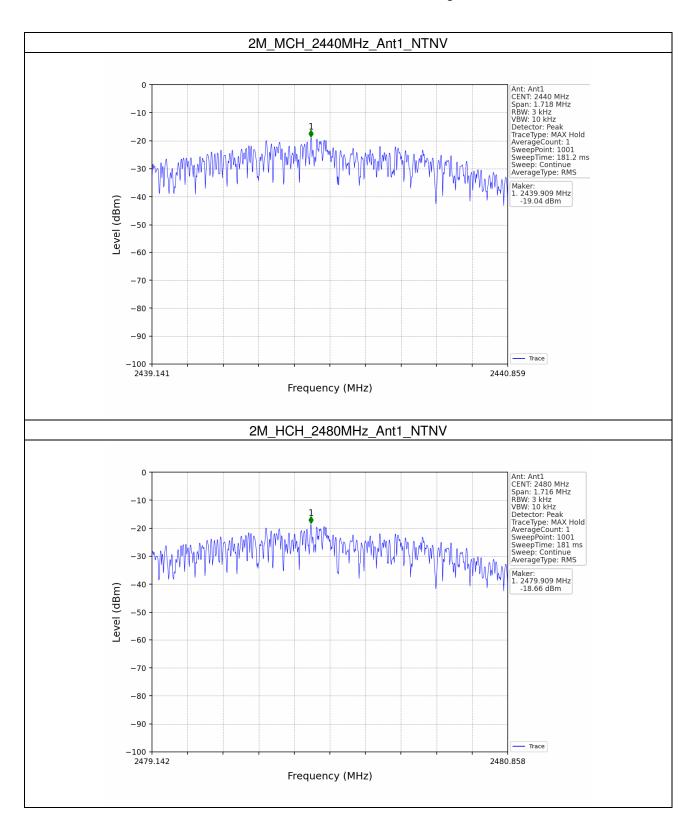
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5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Ref

5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
		2402	1	-1.16
1M	SISO	2440	1	-1.10
		2480	1	-0.94
	SISO	2402	1	-1.21
2M		2440	1	-1.21
		2480	1	-0.97



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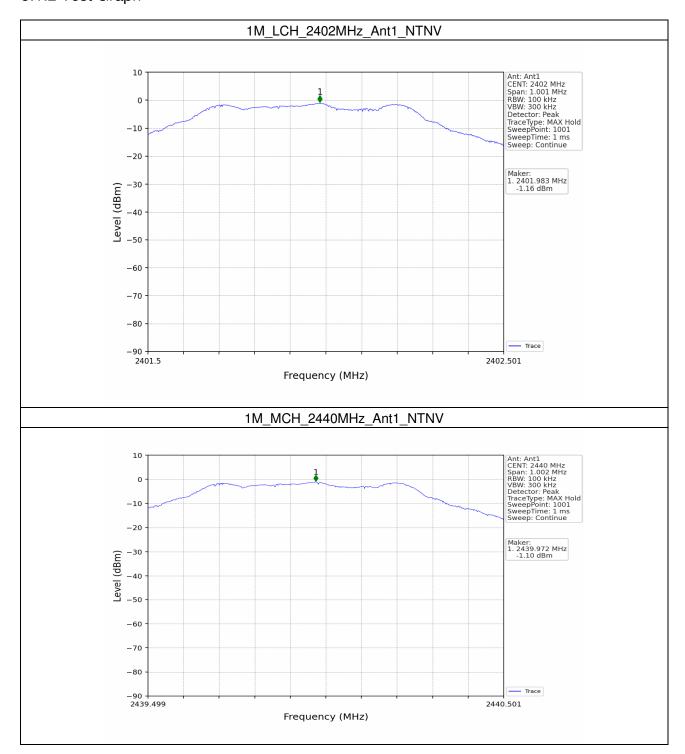


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5.1.2 Test Graph





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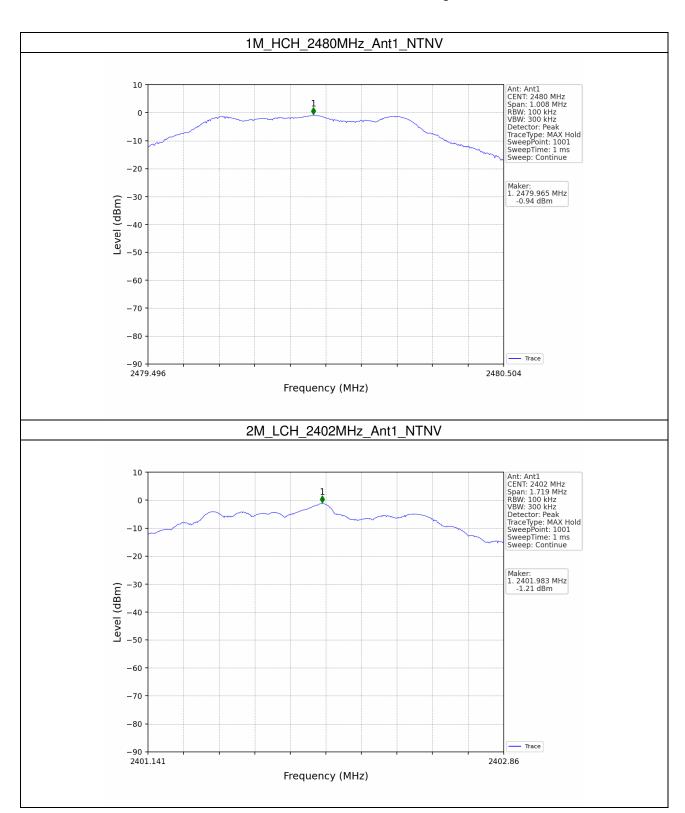
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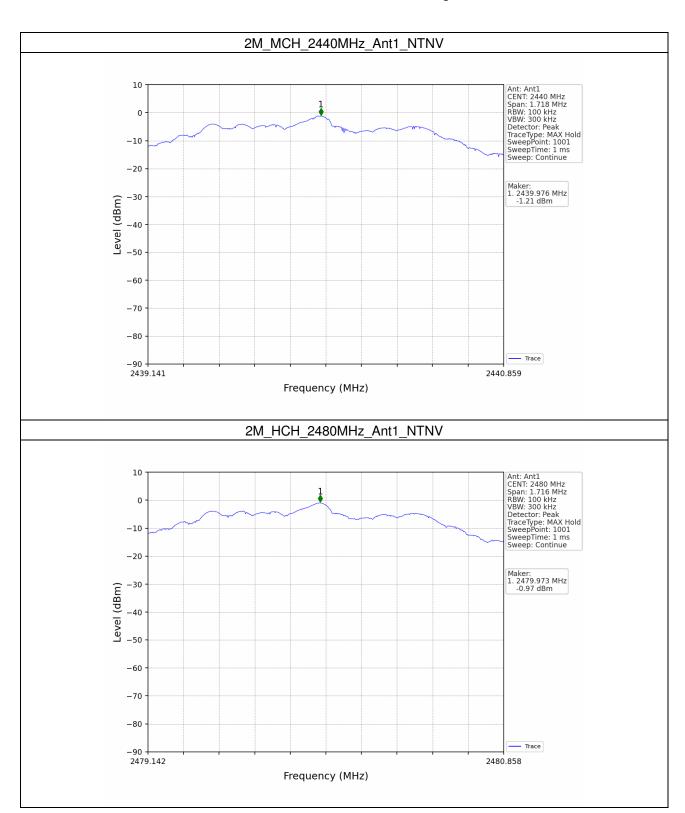
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5.2 CSE

5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
		2402	1	-0.94	-20.94	Pass
1M	SISO	2440	1	-0.94	-20.94	Pass
		2480	1	-0.94	-20.94	Pass
	SISO	2402	1	-0.97	-20.97	Pass
2M		2440	1	-0.97	-20.97	Pass
		2480	1	-0.97	-20.97	Pass



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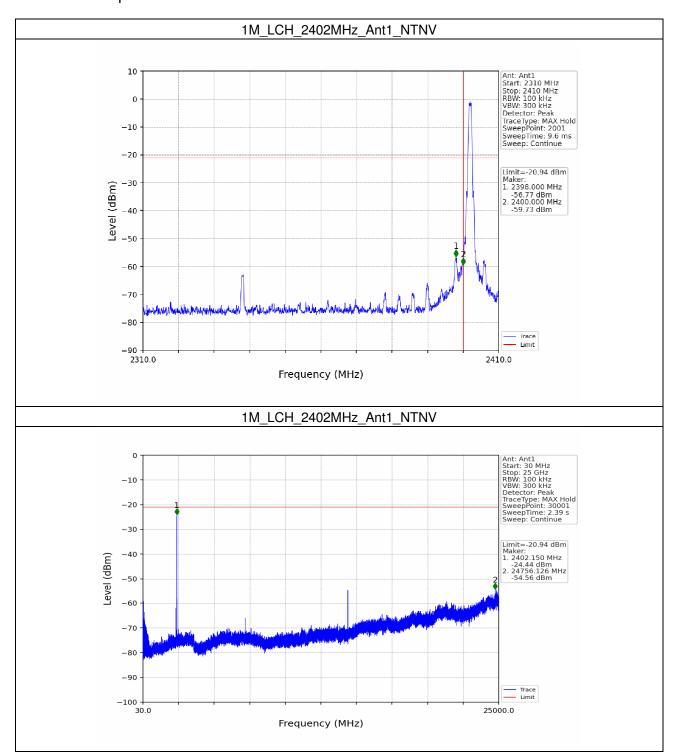


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5.2.2 Test Graph





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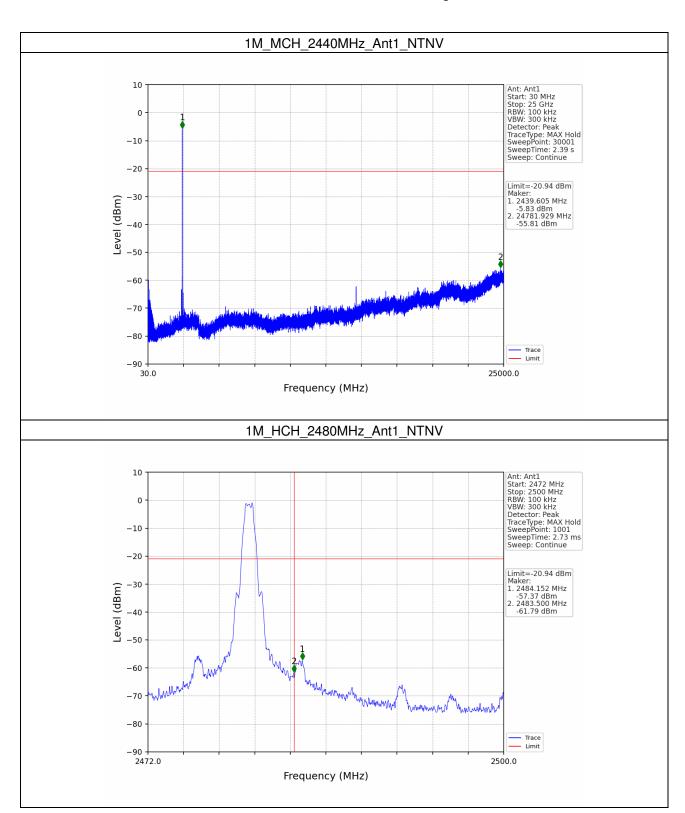
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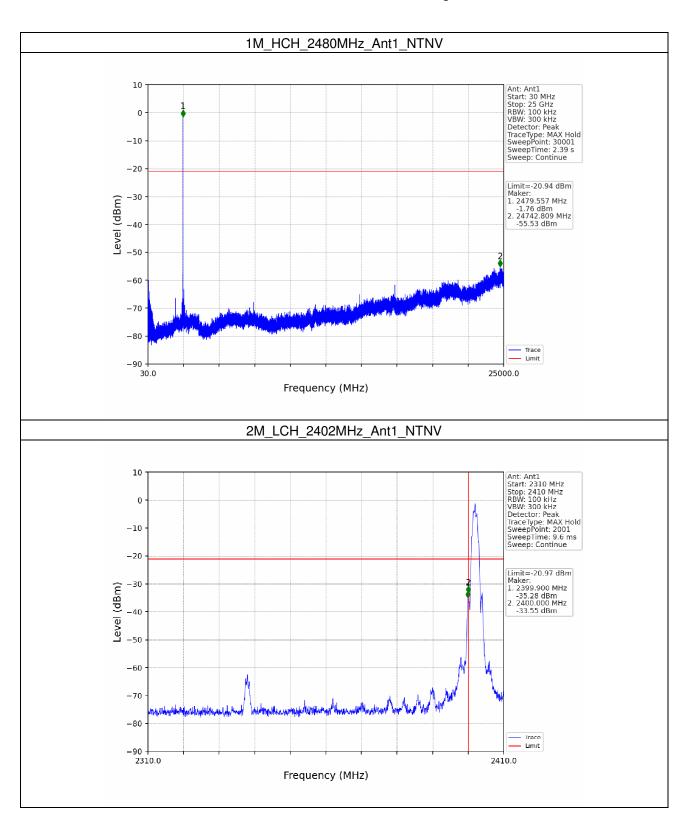
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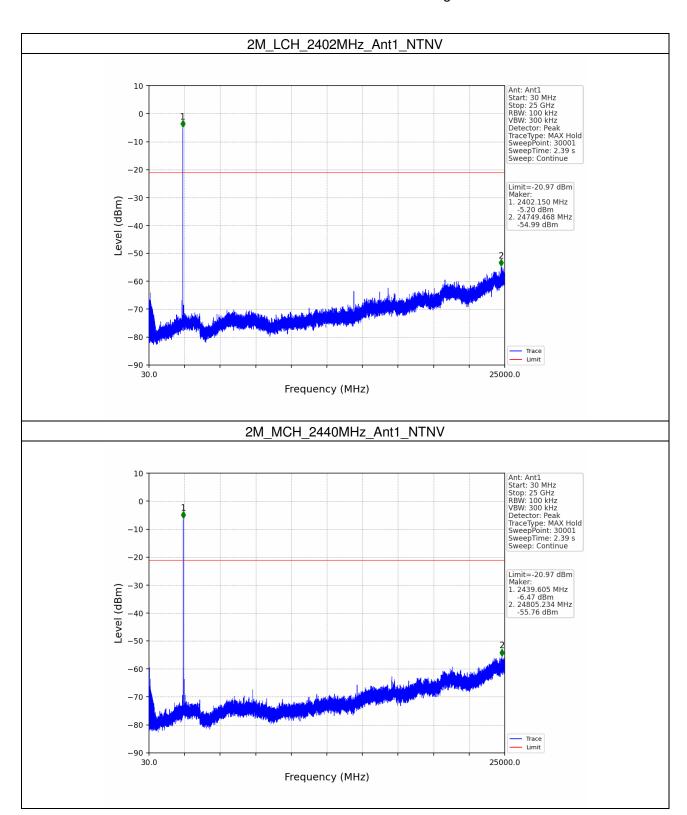
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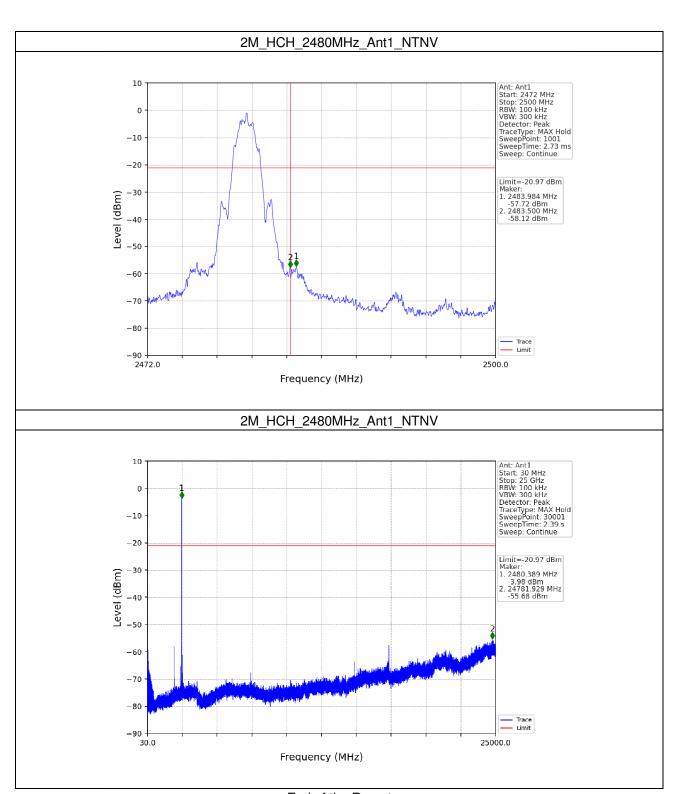
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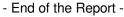


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