

Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 1 of 162

TEST REPORT

Application No.: FYCR2210000432AT

Applicant: Cosonic Intelligent Technologies Co., Ltd.

Address of Applicant: 5th Floor,1st Building, No.6 South Industry Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan, Guangdong, China

Manufacturer: Cosonic Intelligent Technologies Co., Ltd.

Address of Manufacturer: Room 506 building 1, No.6, South Industrial Road, Songshan Lake High-tech Industrial Development Zone, Dongguan, Guangdong, China

Factory: Cosonic Intelligent Technologies Co., Ltd.

Address of Factory: Room 506 building 1, No.6, South Industrial Road, Songshan Lake High-tech Industrial Development Zone, Dongguan, Guangdong, China

Equipment Under Test (EUT):

EUT Name: ONN. TRUE WRLS GEN3

Model No.: 100069415, AAWHT100069415, AALUGO100069415, AABLSV100069415, AAORRA100069415, AALAV100069415, AABLK100069415, AAASH100069415 ♣

♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark: onn.

FCC ID: 2ALVK-ONN100069415

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

Date of Receipt: 2022-10-31

Date of Test: 2022-11-03 to 2022-11-09

Date of Issue: 2022-11-16

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Winkey Wang
EMC Technical Manager



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Report No.: FYCR221000043202

Page: 2 of 162

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022-11-16		Original

Authorized for issue by:				
		Tree Zhan		
		Tree Zhan/Project Engineer		
		Winkey Wang		
		Winkey Wang/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
Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence		N/A	47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(1)	Pass
20dB Bandwidth		ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.247(a)(1)	Pass
Carrier Frequencies Separation		ANSI C63.10 (2013) Section 7.8.2	47 CFR Part 15, Subpart C 15.247a(1)	Pass
Hopping Channel Number		ANSI C63.10 (2013) Section 7.8.3	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Dwell Time		ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 7.8.6	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 7.8.8	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.: 100069415, AAWHT100069415, AALUGO100069415, AABLSV100069415, AAORRA100069415, AALAV100069415, AABLK100069415, AAASH100069415

Only the model 100069415 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., colour of enclosure.



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

Report No.: FYCR221000043202

Page: 4 of 162

3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	6
4.1 DETAILS OF E.U.T.	6
4.2 DESCRIPTION OF SUPPORT UNITS	6
4.3 MEASUREMENT UNCERTAINTY	7
4.4 TEST LOCATION	8
4.5 TEST FACILITY	8
4.6 DEVIATION FROM STANDARDS	8
4.7 ABNORMALITIES FROM STANDARD CONDITIONS	8
5 EQUIPMENT LIST	9
6 RADIO SPECTRUM TECHNICAL REQUIREMENT	12
6.1 ANTENNA REQUIREMENT	12
6.1.1 Test Requirement:	12
6.2 OTHER REQUIREMENTS FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM HOPPING SEQUENCE	13
6.2.1 Test Requirement:	13
6.2.2 Conclusion	13
7 RADIO SPECTRUM MATTER TEST RESULTS	14
7.1 CONDUCTED PEAK OUTPUT POWER	14
7.1.1 E.U.T. Operation	14
7.1.2 Test Mode Description	14
7.1.3 Test Setup Diagram	15
7.1.4 Measurement Procedure and Data	15
7.2 20dB BANDWIDTH	16
7.2.1 E.U.T. Operation	16
7.2.2 Test Mode Description	16
7.2.3 Test Setup Diagram	16
7.2.4 Measurement Procedure and Data	16
7.3 CARRIER FREQUENCIES SEPARATION	17
7.3.1 E.U.T. Operation	17
7.3.2 Test Mode Description	17
7.3.3 Test Setup Diagram	18
7.3.4 Measurement Procedure and Data	18
7.4 HOPPING CHANNEL NUMBER	19
7.4.1 E.U.T. Operation	19
7.4.2 Test Mode Description	19
7.4.3 Test Setup Diagram	20
7.4.4 Measurement Procedure and Data	20



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

Report No.: FYCR221000043202

Page: 5 of 162

7.5	DWELL TIME	21
7.5.1	E.U.T. Operation	21
7.5.2	Test Mode Description	21
7.5.3	Test Setup Diagram	22
7.5.4	Measurement Procedure and Data.....	22
7.6	CONDUCTED BAND EDGES MEASUREMENT	23
7.6.1	E.U.T. Operation	23
7.6.2	Test Mode Description	23
7.6.3	Test Setup Diagram	24
7.6.4	Measurement Procedure and Data.....	24
7.7	CONDUCTED SPURIOUS EMISSIONS.....	25
7.7.1	E.U.T. Operation	25
7.7.2	Test Mode Description	25
7.7.3	Test Setup Diagram	26
7.7.4	Measurement Procedure and Data.....	26
7.8	RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	27
7.8.1	E.U.T. Operation	27
7.8.2	Test Mode Description	27
7.8.3	Test Setup Diagram	28
7.8.4	Measurement Procedure and Data.....	29
7.9	RADIATED SPURIOUS EMISSIONS BELOW 1GHz	38
7.9.1	E.U.T. Operation	38
7.9.2	Test Mode Description	38
7.9.3	Test Setup Diagram	39
7.9.4	Measurement Procedure and Data.....	39
7.10	RADIATED SPURIOUS EMISSIONS ABOVE 1GHz	44
7.10.1	E.U.T. Operation.....	44
7.10.2	Test Mode Description	44
7.10.3	Test Setup Diagram	44
7.10.4	Measurement Procedure and Data.....	45
8	TEST SETUP PHOTO.....	58
9	EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	58
10	APPENDIX.....	59



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

Report No.: FYCR221000043202

Page: 6 of 162

4 General Information

4.1 Details of E.U.T.

Power supply:	Left earbuds: Li-Ion Polymer Battery 3.7V 35mAh (Charge by travel case) Right earbuds: Li-Ion Polymer Battery 3.7V 35mAh (Charge by travel case) travel case with backup battery: Li-Ion Polymer Battery 3.7V 450mAh (Charged by USB port)
Cable(s):	Type C cable:22cm unshielded
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.3 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	FPC Antenna
Antenna Gain:	Left earbud:-1.36dBi Right earbud:-1.36dBi

Remark: The information in this section is provided by the applicant or manufacturer, CCS 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.			



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

Report No.: FYCR221000043202

Page: 7 of 162

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Peak Output Power	$\pm 0.8\text{dB}$
20dB Bandwidth	$\pm 0.3\%$
Carrier Frequencies Separation	$\pm 0.3\%$
Hopping Channel Number	$\pm 0.3\%$
Dwell Time	$\pm 0.3\%$
Conducted Band Edges Measurement	$\pm 2.7\text{dB}$
Conducted Spurious Emissions	$\pm 2.7\text{dB}$
Radiated Emissions which fall in the restricted bands	$\pm 4.4\text{dB}$ (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	$\pm 3.1\text{dB}$ (Below 1GHz)
Radiated Spurious Emissions Above 1GHz	$\pm 4.4\text{dB}$ (Above 1GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (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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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 8 of 162

4.4 Test Location

All tests were performed at:

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Fuyong lab. Xinlong TechnoPark, Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 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. 6606.01)

Compliance Certification Services (Kunshan) Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 6606.01.

• FCC –Designation Number: CN1322

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 9 of 162

5 Equipment List

Conducted Peak Output Power					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

20dB Bandwidth					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Carrier Frequencies Separation					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Hopping Channel Number					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A



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Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 10 of 162

Dwell Time					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2021/7/11	2024/7/10
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-23	2022/4/24	2023/4/23
Pre-amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2022/7/12	2023/7/11
Pre-amplifier	Rohde & Schwarz	CH14-H052	SEM005-17	2022/7/12	2023/7/11
Coaxial Cable	CCS	N/A	SEM035-02	2022/5/16	2023/5/15
Coaxial Cable	CCS	N/A	SEM035-03	2022/5/16	2023/5/15
Pre-amplifier	TST PASS	LNA04080G30	SEM005-27	2022/4/15	2023/4/14
Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2022/4/15	2023/4/14
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A



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

Report No.: FYCR221000043202

Page: 11 of 162

Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
MXE EMI receiver	Agilent	N9038A	SEM004-05	2022/7/12	2023/7/11
Pre-amplifier	HP	8447D	SEM005-02	2022/7/12	2023/7/11
Coaxial Cable	CCS	N/A	SEM035-01	2022/5/16	2023/5/15
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-23	2022/4/24	2023/4/23
Coaxial Cable	CCS	N/A	SEM035-03	2022/5/16	2023/5/15
Pre-amplifier	TST PASS	LNA04080G30	SEM005-27	2022/4/15	2023/4/14
Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2022/4/15	2023/4/14
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-22	2022-07-12	2023-07-11
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-23	2022-07-12	2023-07-11
Barometer	DUMAI	DYM3	SEM002-24	2022-07-12	2023-07-11



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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)

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 as below.

Left earbud:-1.36dBi Right earbud:-1.36dBi

Antenna location: Refer to Internal photos.



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

Report No.: FYCR221000043202

Page: 13 of 162

6.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

6.2.2 Conclusion

Standard Requirement:

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- > Number of shift register stages: 9
- > Length of pseudo-random sequence: $2^9 - 1 = 511$ bits
- > Longest sequence of zeros: 8 (non-inverted signal)

Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

Each frequency used equally on the average by each transmitter.

According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.

According to Technical specification, the system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels.

The system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.



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7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(1)

Test Method: ANSI C63.10 (2013) Section 7.8.5

Limit: $\leq 20.97\text{dBm}$

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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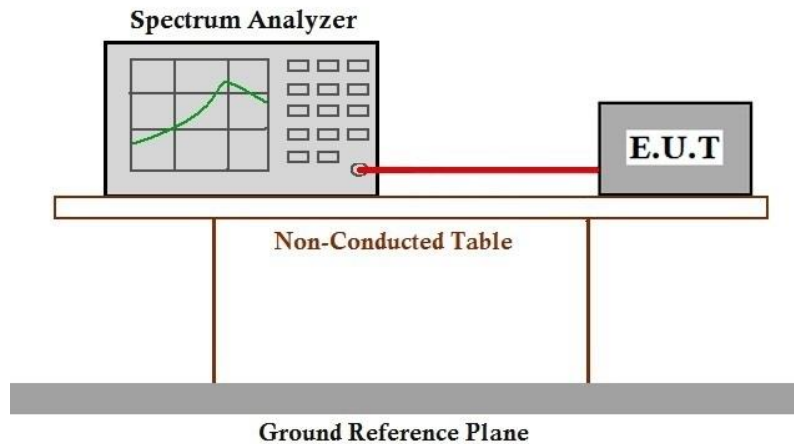
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 15 of 162

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

Report No.: FYCR221000043202

Page: 16 of 162

7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247(a)(1)

Test Method: ANSI C63.10 (2013) Section 7.8.7

7.2.1 E.U.T. Operation

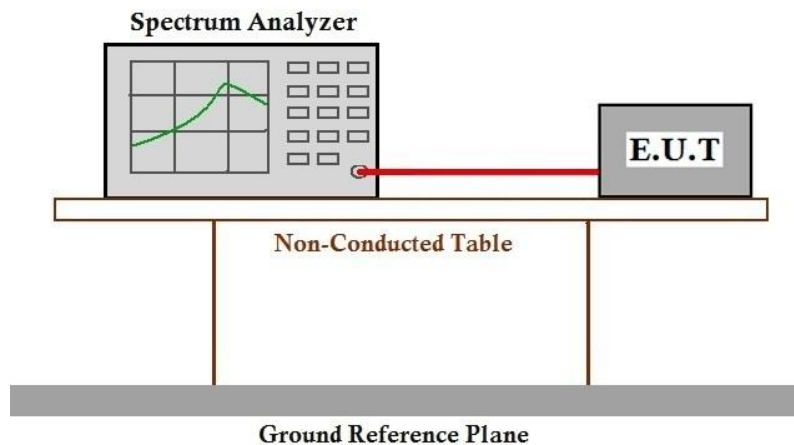
Operating Environment:

Temperature: 24.4 °C Humidity: 57.0 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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

Report No.: FYCR221000043202

Page: 17 of 162

7.3 Carrier Frequencies Separation

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)

Test Method: ANSI C63.10 (2013) Section 7.8.2

Limit:

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

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	03	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

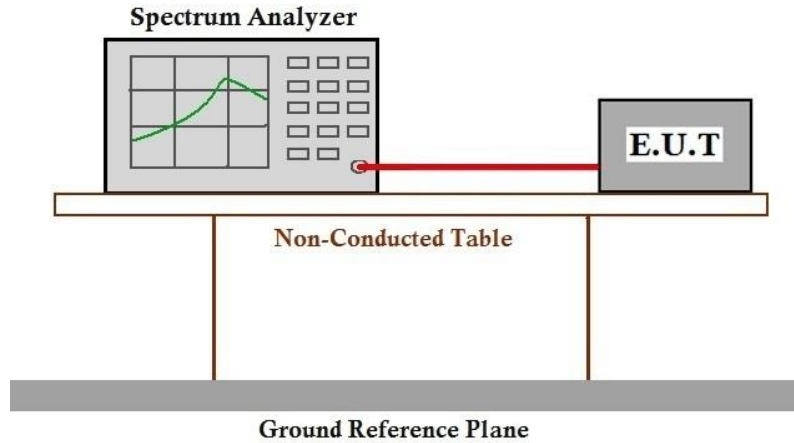


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7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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

Report No.: FYCR221000043202

Page: 19 of 162

7.4 Hopping Channel Number

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)

Test Method: ANSI C63.10 (2013) Section 7.8.3

Limit:

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	03	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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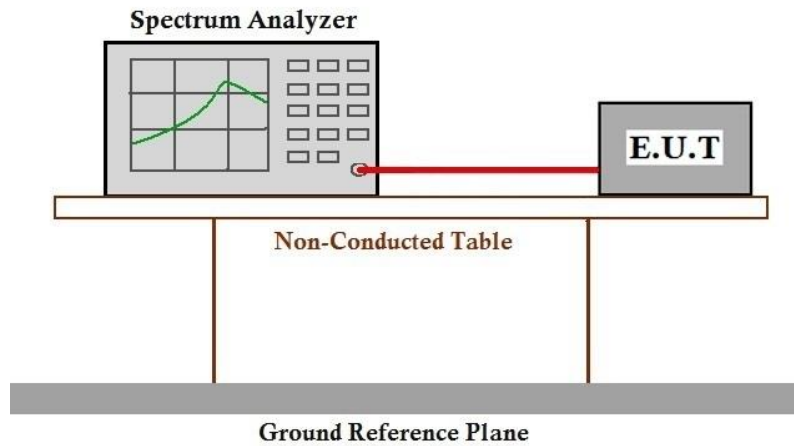
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 20 of 162

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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

Report No.: FYCR221000043202

Page: 21 of 162

7.5 Dwell Time

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)

Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	03	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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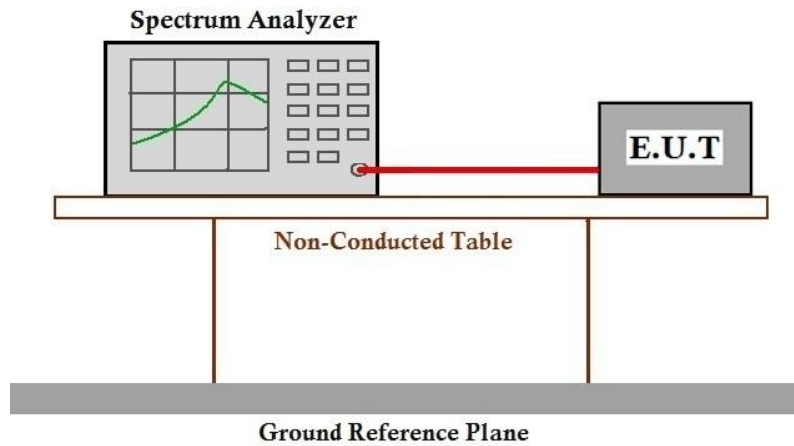
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 22 of 162

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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

Report No.: FYCR221000043202

Page: 23 of 162

7.6 Conducted Band Edges Measurement

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

Test Method: ANSI C63.10 (2013) Section 7.8.6

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)).

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	01	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	03	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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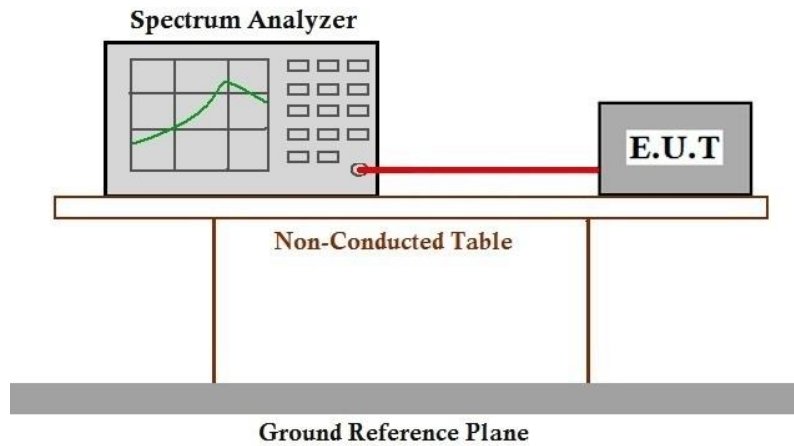
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 24 of 162

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

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Report No.: FYCR221000043202

Page: 25 of 162

7.7 Conducted Spurious Emissions

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

Test Method: ANSI C63.10 (2013) Section 7.8.8

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: 24.4 °C

Humidity: 57.0 % RH

Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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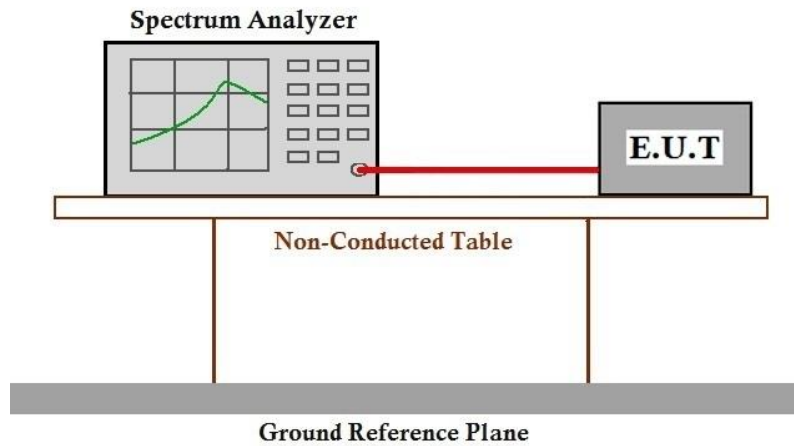
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 26 of 162

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

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

Report No.: FYCR221000043202

Page: 27 of 162

7.8 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)	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.

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

Humidity: 57 % RH

Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

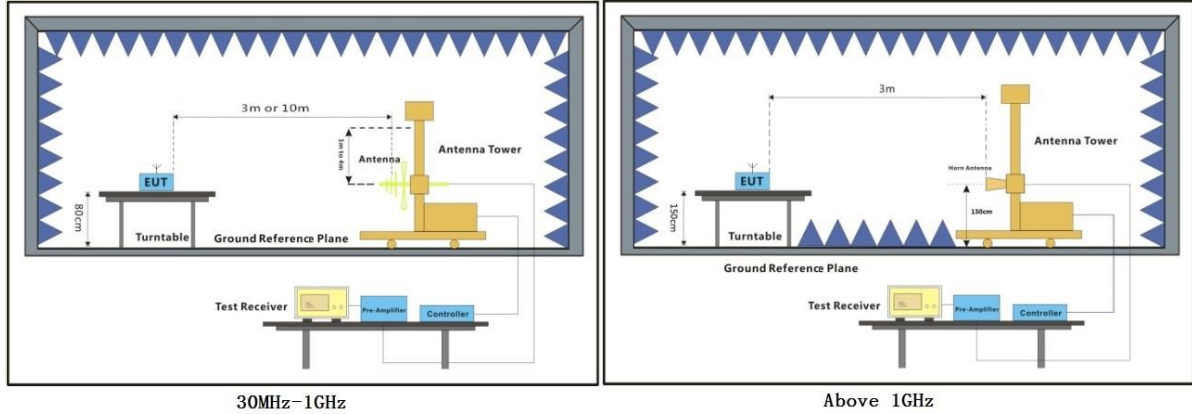
Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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7.8.3 Test Setup Diagram



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

Report No.: FYCR221000043202

Page: 29 of 162

7.8.4 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 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 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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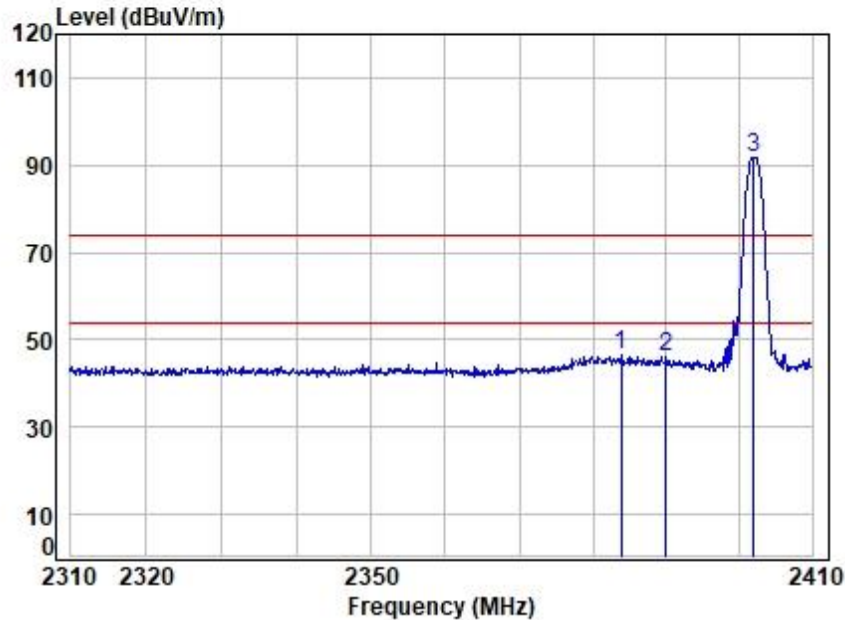
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 30 of 162

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



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2402 Band edge
Note : BT L

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2383.793	5.05	27.14	32.50	47.06	46.75	74.00	-27.25 peak
2	2390.000	5.05	27.16	32.50	46.41	46.12	74.00	-27.88 peak
3	2402.000	5.06	27.18	32.50	92.18	91.92	74.00	17.92 peak



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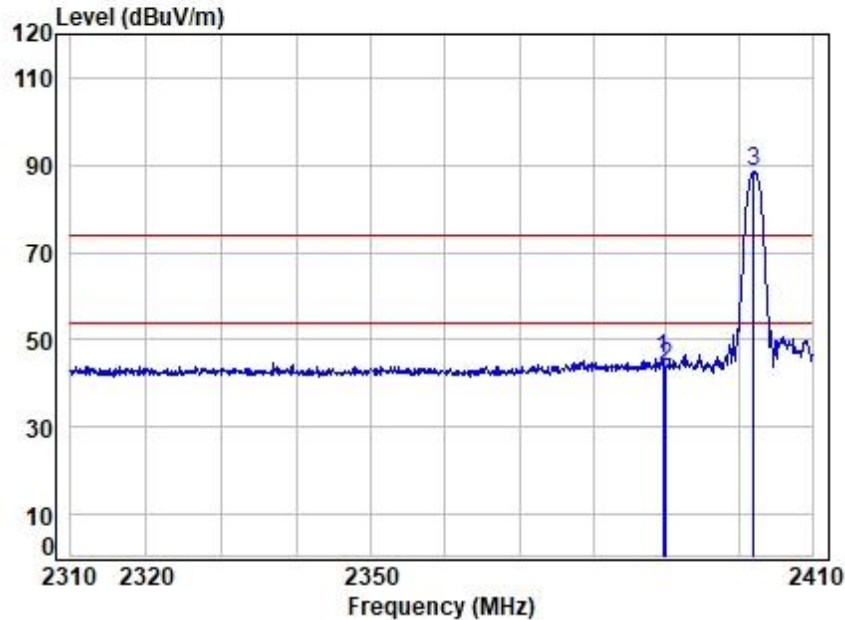
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 31 of 162

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



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2402 Band edge
Note : BT L

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.558	5.05	27.16	32.50	46.12	45.83	74.00	-28.17	peak
2	2390.000	5.05	27.16	32.50	44.19	43.90	74.00	-30.10	peak
3	2402.000	5.06	27.18	32.50	88.56	88.30	74.00	14.30	peak



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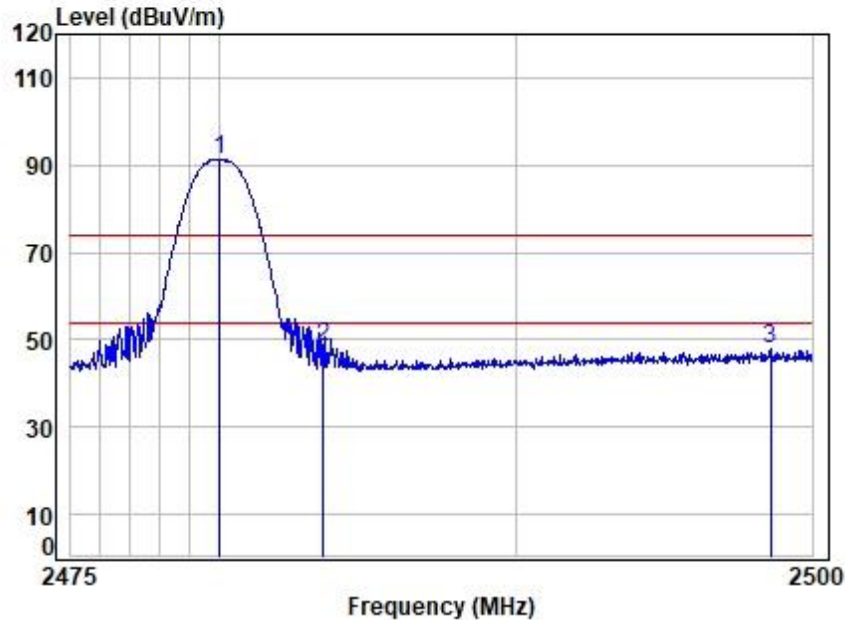
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 32 of 162

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



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2480 Band edge
Note : BT L

		Cable	Ant	Preamp	Read	Limit	Over	
Freq		Loss	Factor	Factor	Level	Line	Limit	Remark
MHz		dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 . 2480.000		5.12	27.36	32.50	91.15	91.13	74.00	17.13 peak
2 2483.500		5.12	27.36	32.50	48.19	48.17	74.00	-25.83 peak
3 2498.593		5.13	27.40	32.50	48.03	48.06	74.00	-25.94 peak



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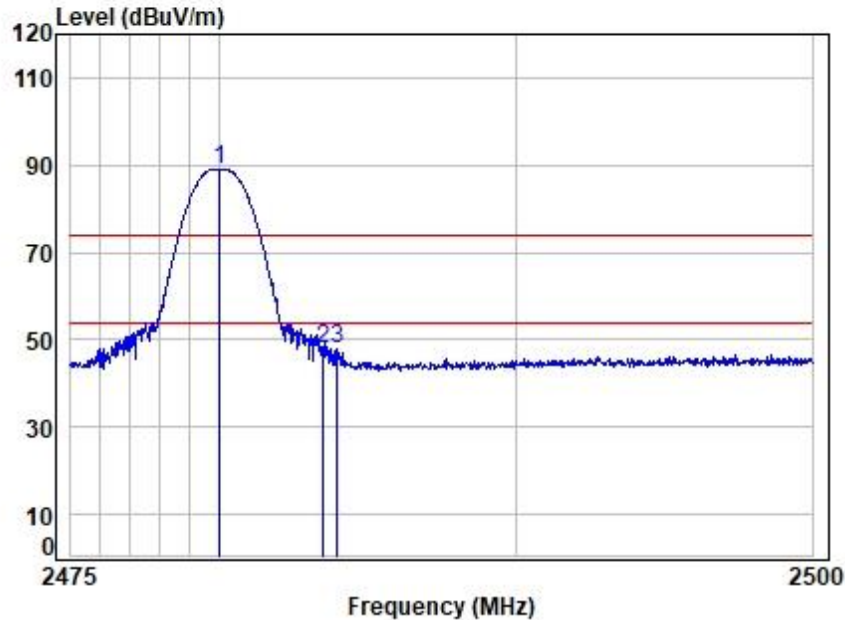
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 33 of 162

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



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2480 Band edge
Note : BT L

		Cable	Ant	Preamp	Read	Limit	Over	
Freq		Loss	Factor	Factor	Level	Line	Limit	Remark
MHz		dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 . 2480.000		5.12	27.36	32.50	88.99	88.97	74.00	14.97 peak
2 2483.500		5.12	27.36	32.50	48.09	48.07	74.00	-25.93 peak
3 2483.971		5.12	27.37	32.50	47.97	47.96	74.00	-26.04 peak



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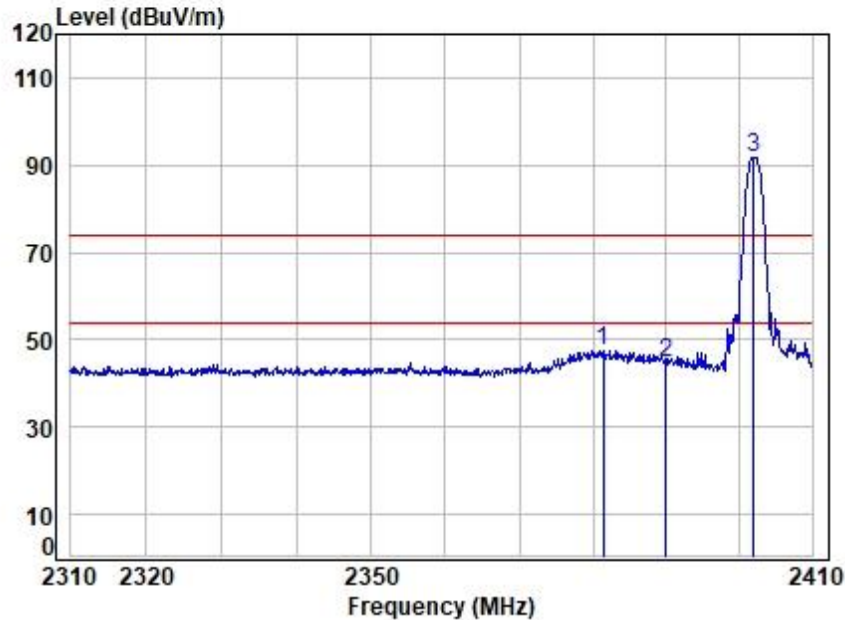
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 34 of 162

Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2402 Band edge
Note : BT R

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2381.370	5.05	27.14	32.50	47.97	47.66	74.00	-26.34 peak
2	2390.000	5.05	27.16	32.50	45.23	44.94	74.00	-29.06 peak
3	2402.000	5.06	27.18	32.50	92.14	91.88	74.00	17.88 peak



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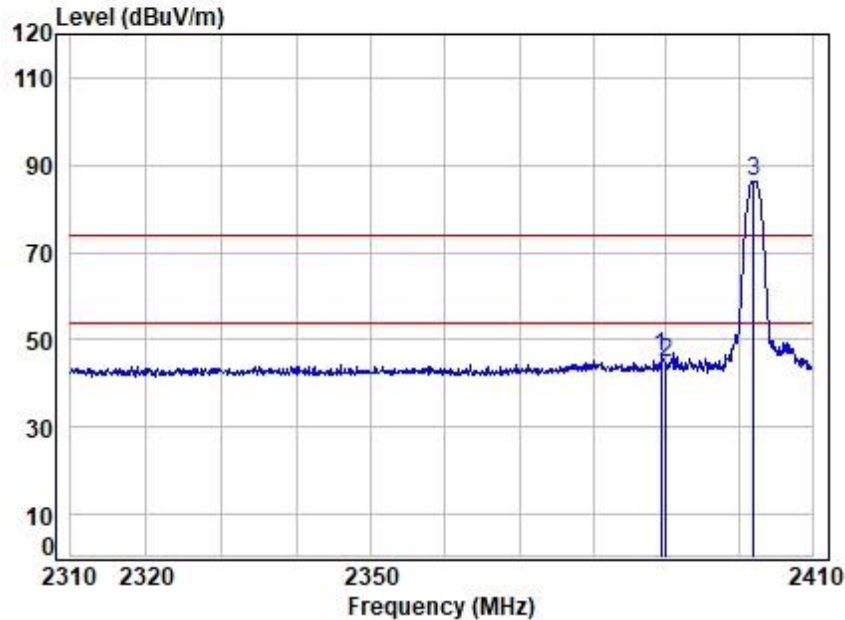
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 35 of 162

Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2402 Band edge
Note : BT R

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.254	5.05	27.16	32.50	46.26	45.97	74.00	-28.03	peak
2	2390.000	5.05	27.16	32.50	44.98	44.69	74.00	-29.31	peak
3	2402.000	5.06	27.18	32.50	86.65	86.39	74.00	12.39	peak



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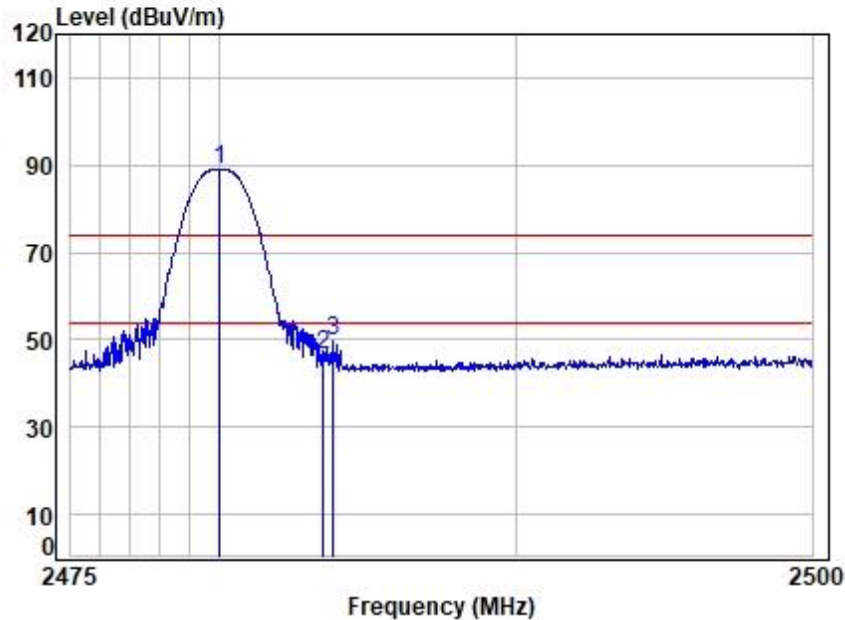
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 36 of 162

Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2480 Band edge
Note : BT R

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2480.000	5.12	27.36	32.50	89.08	89.06	74.00	15.06	peak
2	2483.500	5.12	27.36	32.50	46.52	46.50	74.00	-27.50	peak
3	2483.821	5.12	27.37	32.50	49.94	49.93	74.00	-24.07	peak



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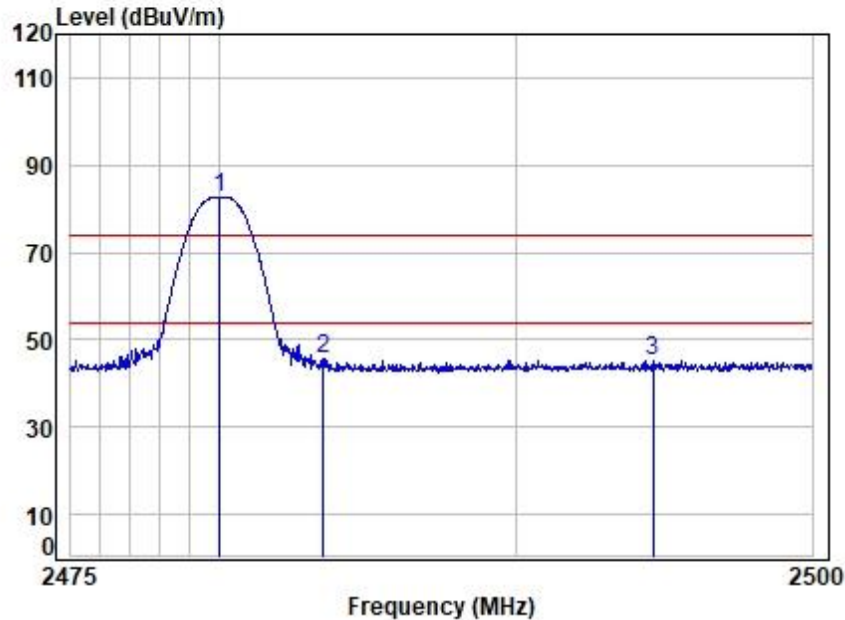
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 37 of 162

Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2480 Band edge
Note : BT R

		Cable	Ant	Preamp	Read	Limit	Over	
Freq		Loss	Factor	Factor	Level	Line	Limit	Remark
MHz		dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 . 2480.000		5.12	27.36	32.50	82.73	82.71	74.00	8.71 peak
2 2483.500		5.12	27.36	32.50	45.77	45.75	74.00	-28.25 peak
3 2494.604		5.13	27.39	32.50	45.22	45.24	74.00	-28.76 peak



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

Report No.: FYCR221000043202

Page: 38 of 162

7.9 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

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 21.3 °C

Humidity: 52.8 % RH

Atmospheric Pressure: 1020 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.



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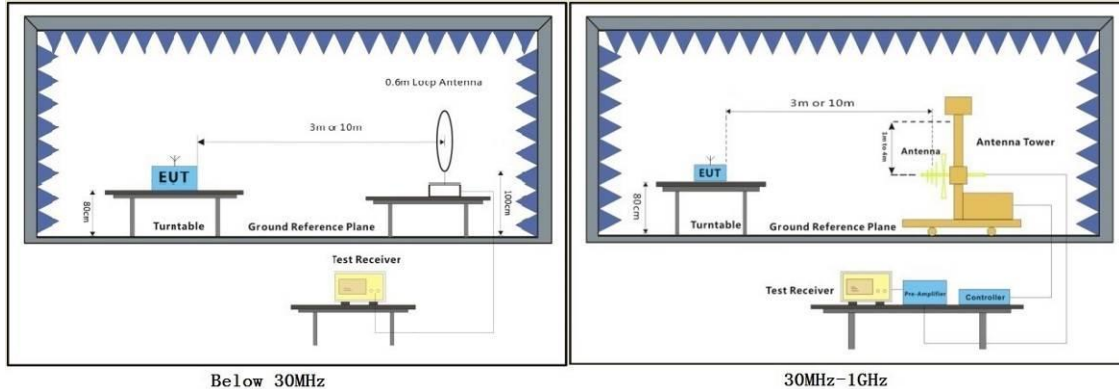
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 39 of 162

7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 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.
- 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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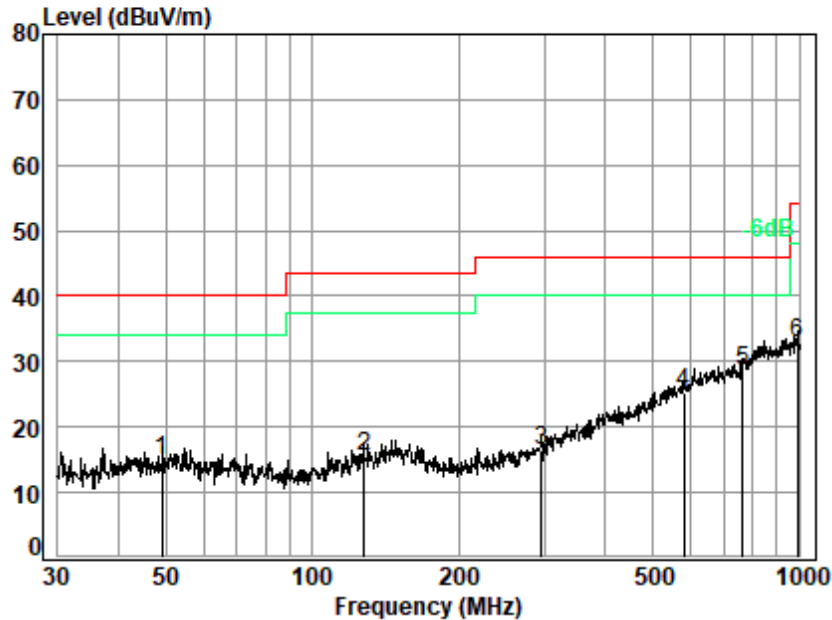
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 40 of 162

Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00432AT
Mode : 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	49.187	0.21	17.34	26.00	23.45	15.00	40.00	-25.00	QP
2	127.665	0.98	16.41	25.56	23.55	15.38	43.50	-28.12	QP
3	296.184	1.00	18.17	25.40	22.77	16.54	46.00	-29.46	QP
4	580.703	2.12	23.97	25.09	24.12	25.12	46.00	-20.88	QP
5	766.057	1.92	26.58	24.32	24.30	28.48	46.00	-17.52	QP
6	993.011	2.79	29.31	24.01	24.74	32.83	54.00	-21.17	QP



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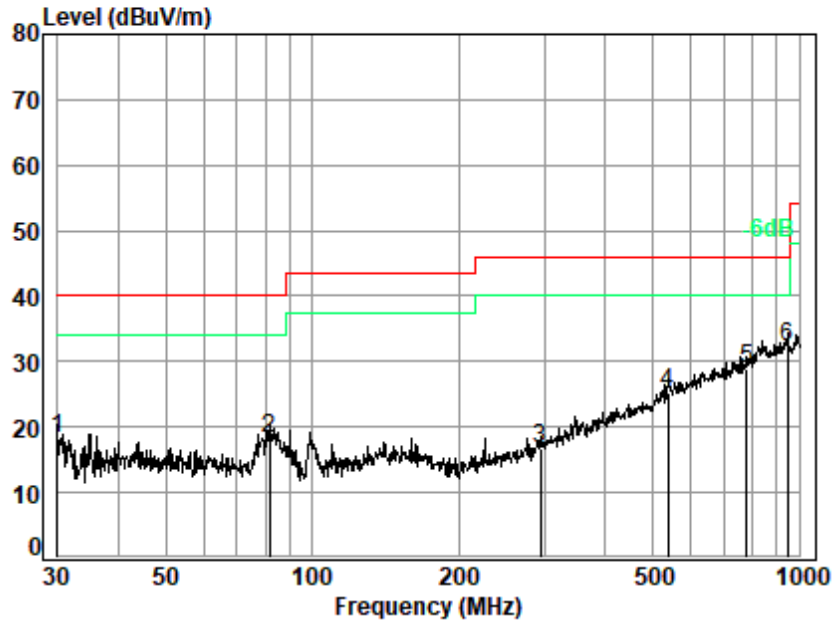
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 41 of 162

Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00432AT
Mode : 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.000	0.20	16.39	26.03	27.70	18.26	40.00	-21.74	QP
2	81.783	0.51	14.26	25.78	29.39	18.38	40.00	-21.62	QP
3	294.114	0.99	18.08	25.40	22.91	16.58	46.00	-29.42	QP
4	537.589	1.75	23.66	25.30	25.29	25.40	46.00	-20.60	QP
5	779.607	1.95	26.79	24.27	24.28	28.75	46.00	-17.25	QP
6	948.761	2.18	29.26	24.05	24.87	32.26	46.00	-13.74	QP



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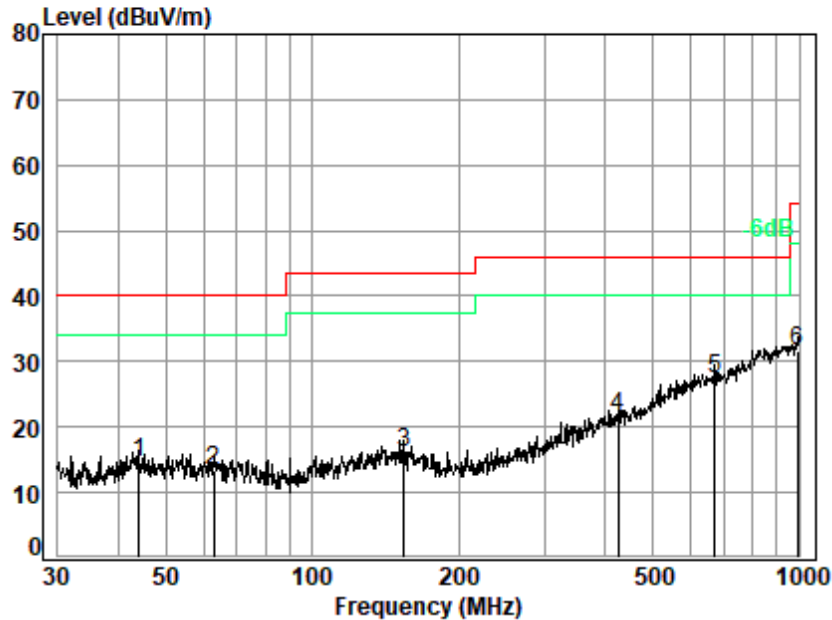
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 42 of 162

Test Mode: 02; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00432AT
Mode : 02

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	43.966	0.22	17.30	26.01	23.06	14.57	40.00	-25.43	QP
2	62.651	0.26	16.69	25.90	22.41	13.46	40.00	-26.54	QP
3	154.279	0.88	17.33	25.52	23.37	16.06	43.50	-27.44	QP
4	425.028	1.58	21.15	25.47	24.39	21.65	46.00	-24.35	QP
5	670.489	1.94	25.48	24.69	24.78	27.51	46.00	-18.49	QP
6	993.011	2.79	29.31	24.01	23.56	31.65	54.00	-22.35	QP



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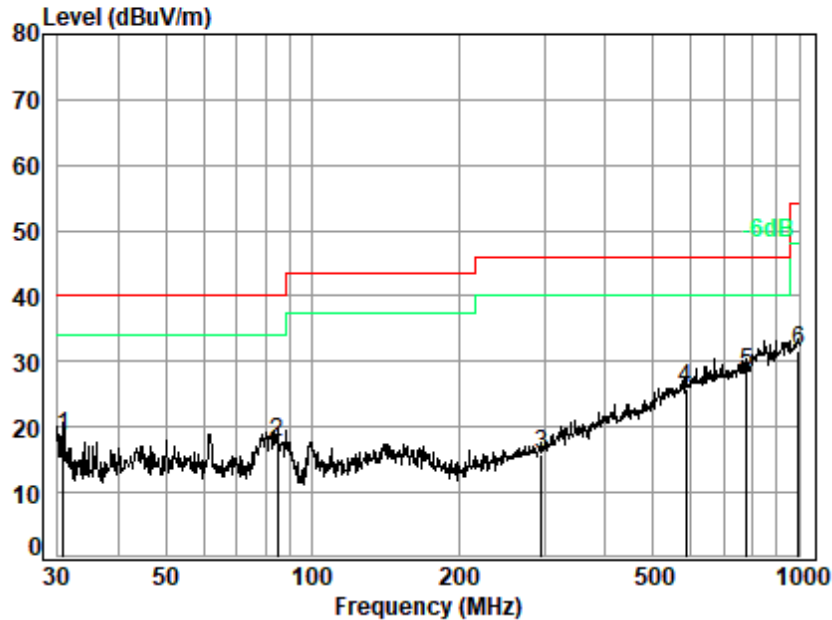
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 43 of 162

Test Mode: 02; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00432AT
Mode : 02

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.745	0.20	15.79	26.03	28.72	18.68	40.00	-21.32	QP
2	84.999	0.59	13.88	25.75	28.93	17.65	40.00	-22.35	QP
3	296.184	1.00	18.17	25.40	21.92	15.69	46.00	-30.31	QP
4	584.790	2.15	24.04	25.07	24.65	25.77	46.00	-20.23	QP
5	779.607	1.95	26.79	24.27	23.80	28.27	46.00	-17.73	QP
6	996.500	2.84	29.30	24.00	23.36	31.50	54.00	-22.50	QP



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

Report No.: FYCR221000043202

Page: 44 of 162

7.10 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

7.10.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C

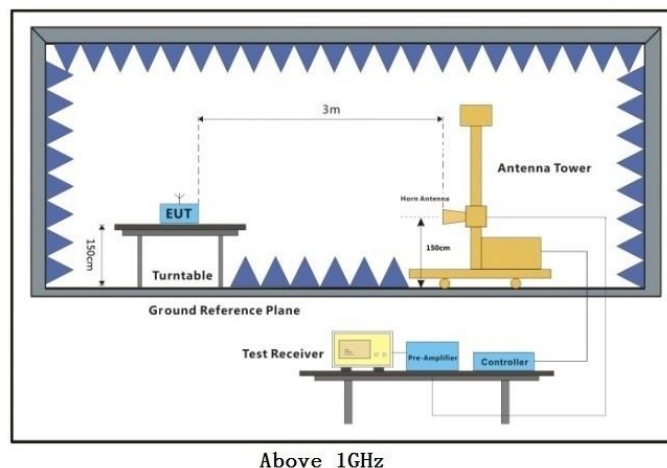
Humidity: 57 % RH

Atmospheric Pressure: 1020 mbar

7.10.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_non-Hop mode(Left earbud) Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	02	TX_non-Hop mode(Right earbud) Keep the EUT in continuously transmitting mode with GFSK modulation, p/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.10.3 Test Setup Diagram



Above 1GHz



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

Report No.: FYCR221000043202

Page: 45 of 162

7.10.4 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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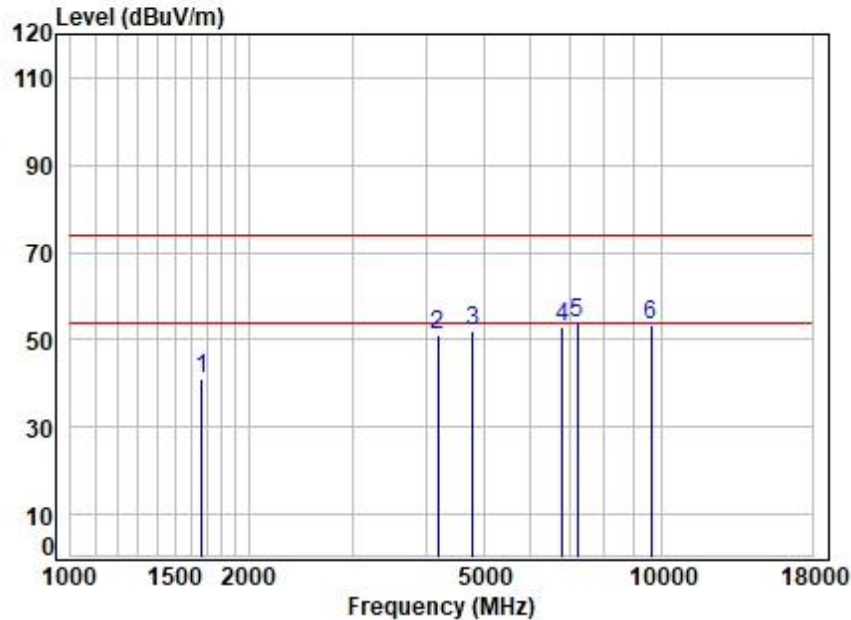
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 46 of 162

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



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2402 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1667.951	4.13	24.94	52.94	64.83	40.96	74.00	-33.04	peak
2	4181.768	7.48	29.76	52.86	66.94	51.32	74.00	-22.68	peak
3	4804.000	7.98	30.94	53.05	66.16	52.03	74.00	-21.97	peak
4	6795.879	7.99	35.32	53.37	62.86	52.80	74.00	-21.20	peak
5	7206.000	8.29	36.05	53.52	63.02	53.84	74.00	-20.16	peak
6	9608.000	11.41	37.53	53.58	57.80	53.16	74.00	-20.84	peak



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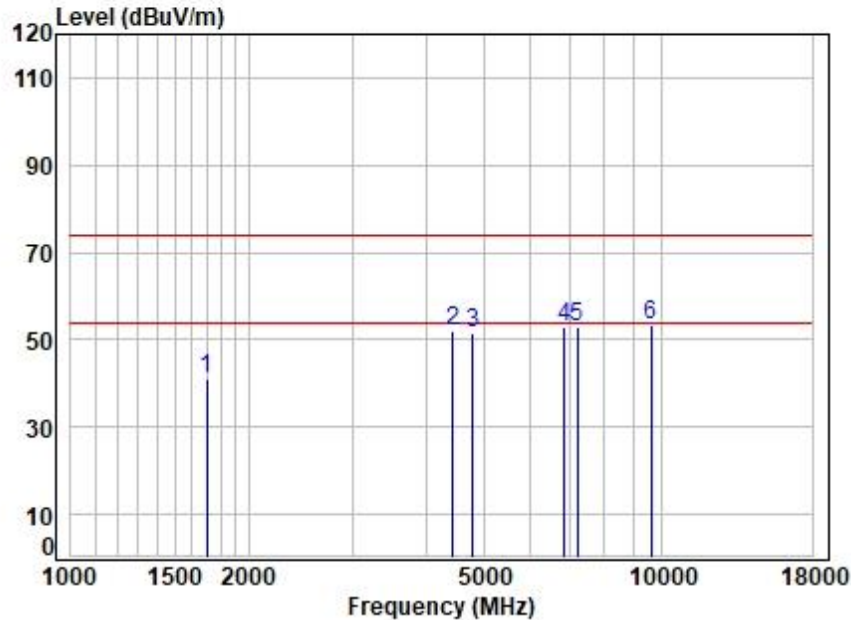
Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 47 of 162

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



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2402 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1702.042	4.20	25.01	52.96	64.62	40.87	74.00	-33.13	peak
2	4430.628	7.47	30.11	52.94	67.38	52.02	74.00	-21.98	peak
3	4804.000	7.98	30.94	53.05	65.67	51.54	74.00	-22.46	peak
4	6855.063	8.05	35.46	53.40	62.75	52.86	74.00	-21.14	peak
5	7206.000	8.29	36.05	53.52	62.29	53.11	74.00	-20.89	peak
6	9608.000	11.41	37.53	53.58	58.00	53.36	74.00	-20.64	peak



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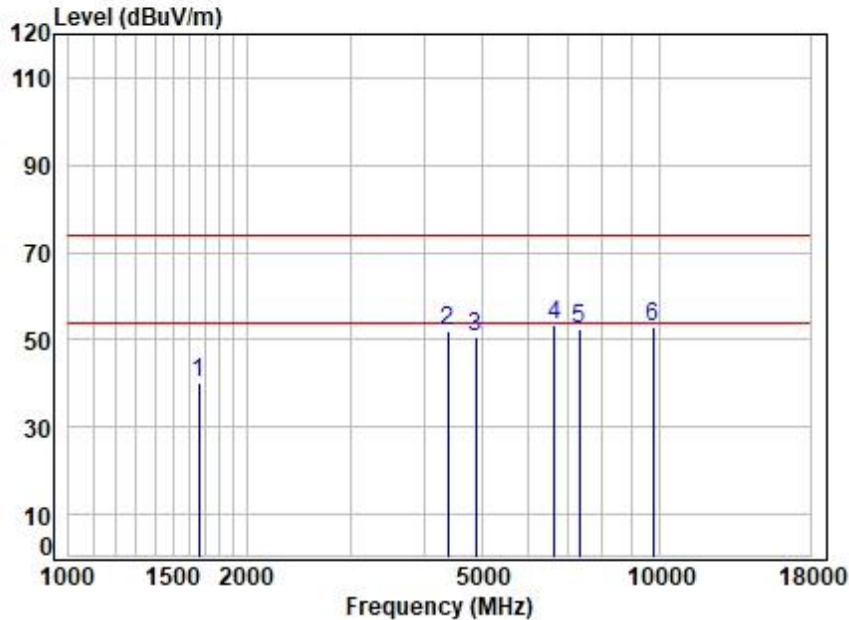
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 48 of 162

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



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2441 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1663.137	4.12	24.93	52.94	64.00	40.11	74.00	-33.89	peak
2	4379.699	7.47	30.04	52.92	67.35	51.94	74.00	-22.06	peak
3	4882.000	8.11	31.13	53.07	64.47	50.64	74.00	-23.36	peak
4	6640.542	7.84	34.95	53.26	63.81	53.34	74.00	-20.66	peak
5	7323.000	8.35	36.19	53.53	61.53	52.54	74.00	-21.46	peak
6	9764.000	11.29	37.88	53.43	57.32	53.06	74.00	-20.94	peak



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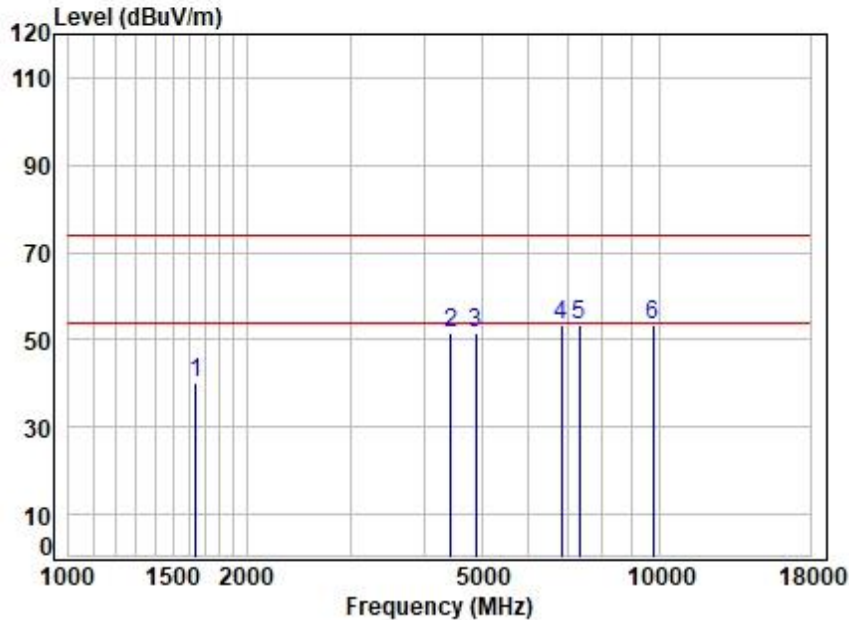
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 49 of 162

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



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2441 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1639.274	4.07	24.88	52.93	63.95	39.97	74.00	-34.03	peak
2	4430.628	7.47	30.11	52.94	66.89	51.53	74.00	-22.47	peak
3	4882.000	8.11	31.13	53.07	65.20	51.37	74.00	-22.63	peak
4	6835.278	8.03	35.41	53.39	63.14	53.19	74.00	-20.81	peak
5	7323.000	8.35	36.19	53.53	62.53	53.54	74.00	-20.46	peak
6	9764.000	11.29	37.88	53.43	57.64	53.38	74.00	-20.62	peak



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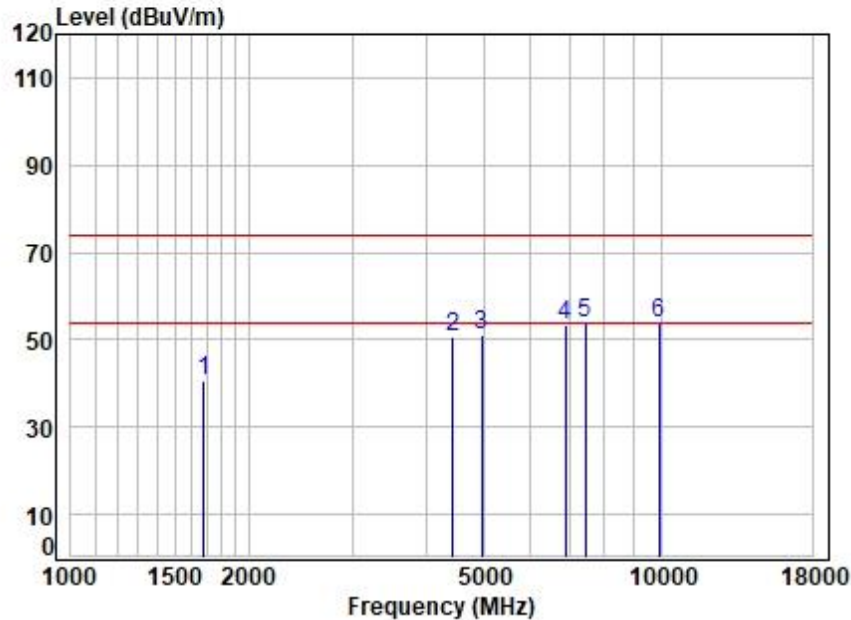
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 50 of 162

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



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2480 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1677.621	4.15	24.96	52.95	64.51	40.67	74.00	-33.33	peak
2	4443.453	7.47	30.12	52.94	66.05	50.70	74.00	-23.30	peak
3	4960.000	8.24	31.31	53.09	64.83	51.29	74.00	-22.71	peak
4	6874.906	8.07	35.51	53.42	63.04	53.20	74.00	-20.80	peak
5	7440.000	8.40	36.33	53.55	62.75	53.93	74.00	-20.07	peak
6	9920.000	11.18	38.22	53.28	57.65	53.77	74.00	-20.23	peak



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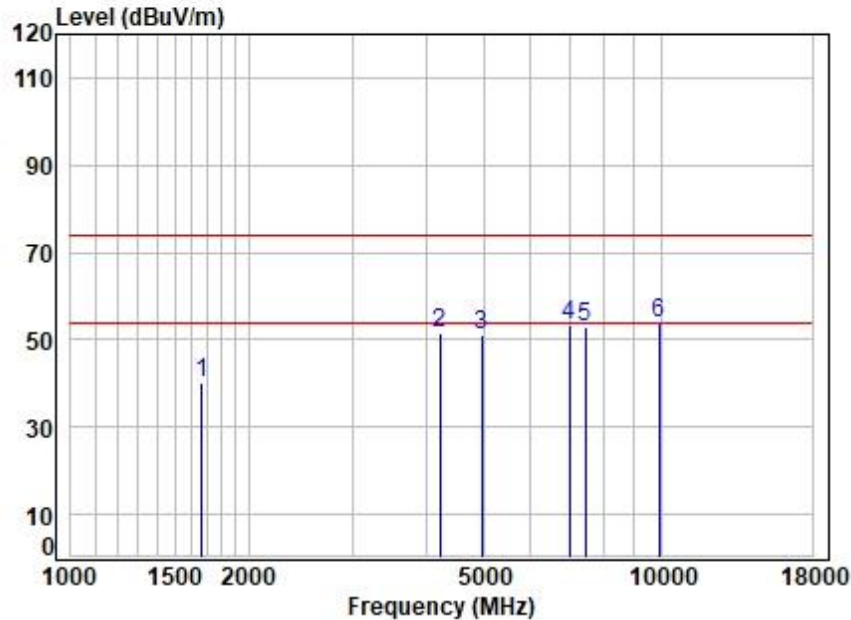
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 51 of 162

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



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2480 TX RSE
: BT L

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1667.951	4.13	24.94	52.94	63.86	39.99	74.00	-34.01	peak
2	4218.186	7.48	29.82	52.87	67.25	51.68	74.00	-22.32	peak
3	4960.000	8.24	31.31	53.09	64.73	51.19	74.00	-22.81	peak
4	6995.172	8.19	35.79	53.50	63.07	53.55	74.00	-20.45	peak
5	7440.000	8.40	36.33	53.55	61.91	53.09	74.00	-20.91	peak
6	9920.000	11.18	38.22	53.28	57.62	53.74	74.00	-20.26	peak



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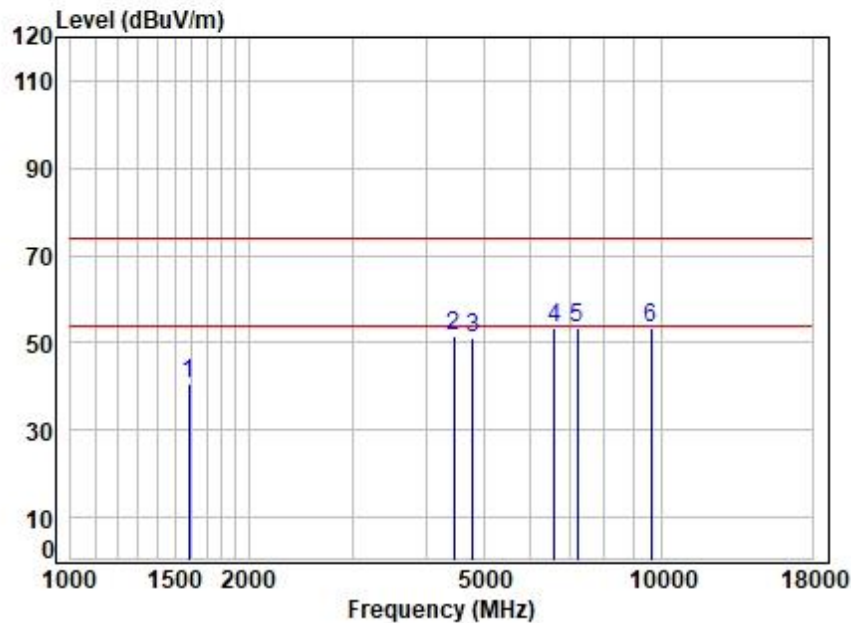
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 52 of 162

Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2402 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1587.975	3.96	24.77	52.90	64.87	40.70	74.00	-33.30	peak
2	4456.315	7.47	30.14	52.95	67.04	51.70	74.00	-22.30	peak
3	4804.000	7.98	30.94	53.05	65.13	51.00	74.00	-23.00	peak
4	6583.209	7.78	34.81	53.22	63.83	53.20	74.00	-20.80	peak
5	7206.000	8.29	36.05	53.52	62.52	53.34	74.00	-20.66	peak
6	9608.000	11.41	37.53	53.58	58.06	53.42	74.00	-20.58	peak



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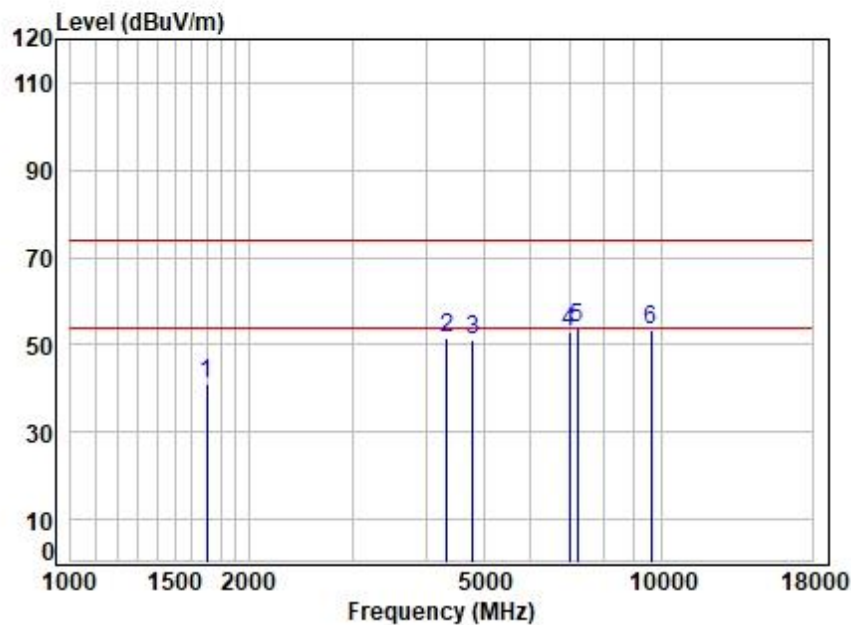
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 53 of 162

Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2402 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1702.042	4.20	25.01	52.96	64.90	41.15	74.00	-32.85	peak
2	4341.886	7.48	29.99	52.91	67.05	51.61	74.00	-22.39	peak
3	4804.000	7.98	30.94	53.05	65.45	51.32	74.00	-22.68	peak
4	6995.172	8.19	35.79	53.50	62.36	52.84	74.00	-21.16	peak
5	7206.000	8.29	36.05	53.52	62.96	53.78	74.00	-20.22	peak
6	9608.000	11.41	37.53	53.58	58.16	53.52	74.00	-20.48	peak



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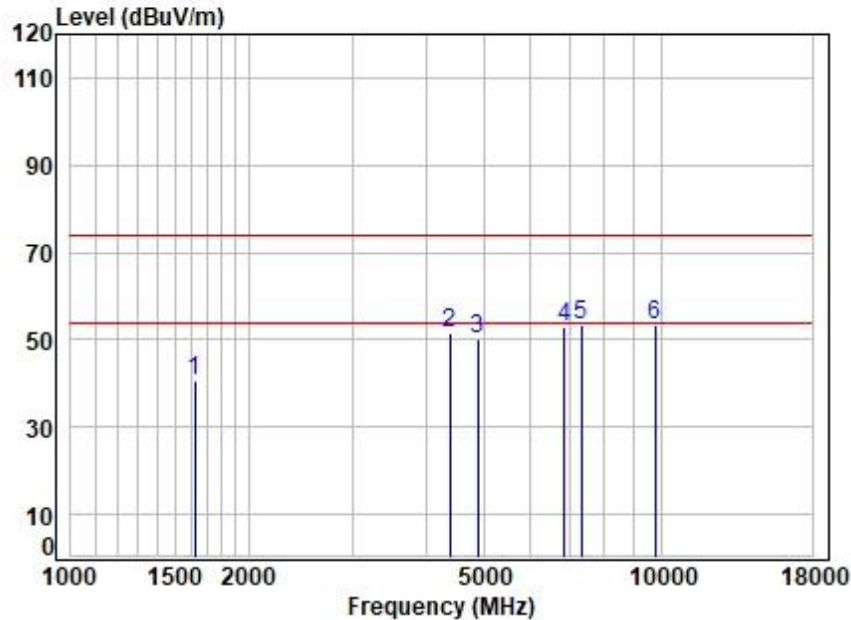
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 54 of 162

Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2441 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1620.431	4.03	24.84	52.92	64.82	40.77	74.00	-33.23	peak
2	4379.699	7.47	30.04	52.92	67.03	51.62	74.00	-22.38	peak
3	4882.000	8.11	31.13	53.07	64.02	50.19	74.00	-23.81	peak
4	6855.063	8.05	35.46	53.40	62.97	53.08	74.00	-20.92	peak
5	7323.000	8.35	36.19	53.53	62.31	53.32	74.00	-20.68	peak
6	9764.000	11.29	37.88	53.43	57.72	53.46	74.00	-20.54	peak



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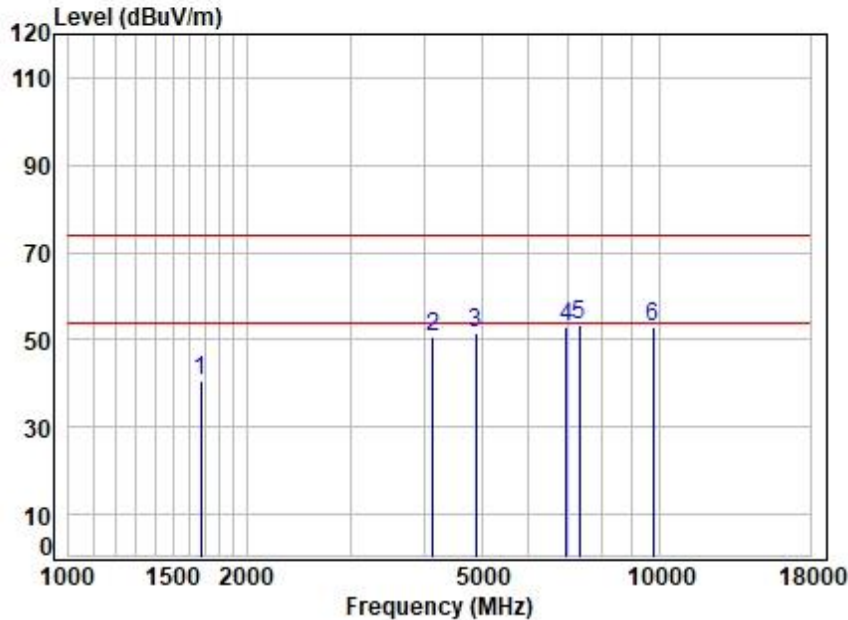
Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 55 of 162

Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2441 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1672.779	4.14	24.95	52.95	64.50	40.64	74.00	-33.36	peak
2	4133.699	7.48	29.70	52.84	66.53	50.87	74.00	-23.13	peak
3	4882.000	8.11	31.13	53.07	65.32	51.49	74.00	-22.51	peak
4	6954.852	8.15	35.70	53.47	62.34	52.72	74.00	-21.28	peak
5	7323.000	8.35	36.19	53.53	62.60	53.61	74.00	-20.39	peak
6	9764.000	11.29	37.88	53.43	57.28	53.02	74.00	-20.98	peak



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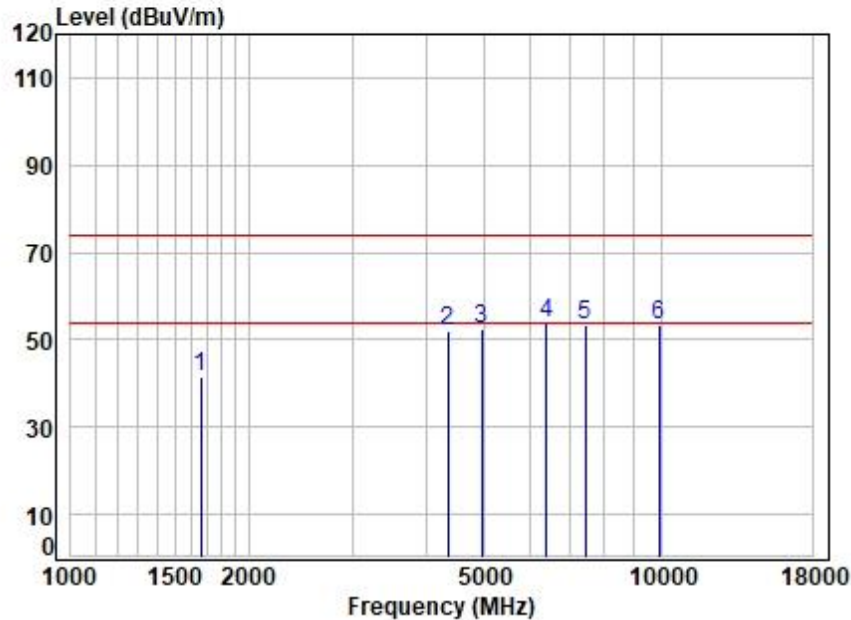
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 56 of 162

Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00431AT/00432AT
Mode : 2480 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1663.137	4.12	24.93	52.94	65.27	41.38	74.00	-32.62	peak
2	4354.454	7.48	30.00	52.91	67.47	52.04	74.00	-21.96	peak
3	4960.000	8.24	31.31	53.09	66.02	52.48	74.00	-21.52	peak
4	6395.654	7.69	34.16	53.09	64.90	53.66	74.00	-20.34	peak
5	7440.000	8.40	36.33	53.55	62.04	53.22	74.00	-20.78	peak
6	9920.000	11.18	38.22	53.28	57.20	53.32	74.00	-20.68	peak



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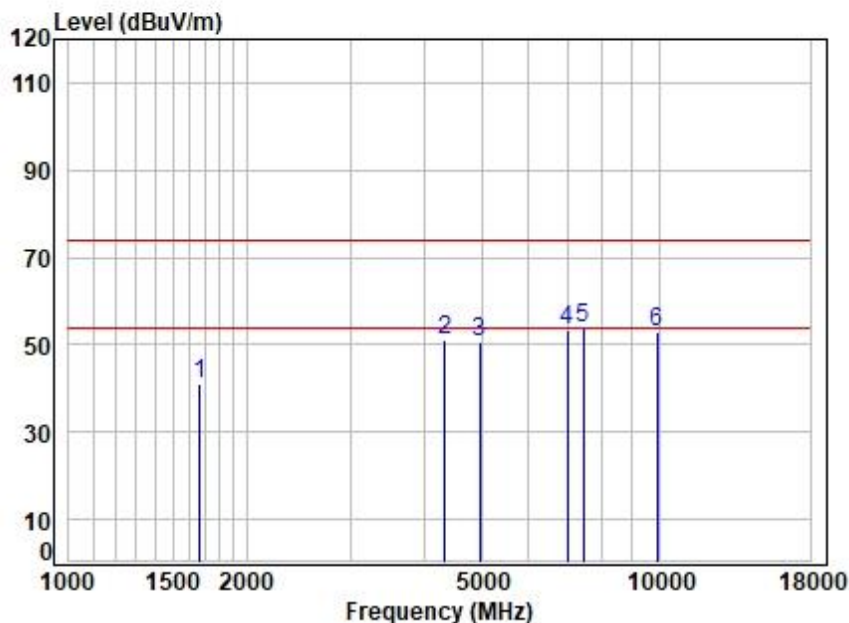
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 57 of 162

Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00431AT/00432AT
Mode : 2480 TX RSE
: BT R

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1667.951	4.13	24.94	52.94	64.80	40.93	74.00	-33.07	peak
2	4341.886	7.48	29.99	52.91	66.50	51.06	74.00	-22.94	peak
3	4960.000	8.24	31.31	53.09	64.31	50.77	74.00	-23.23	peak
4	6974.982	8.17	35.74	53.48	62.97	53.40	74.00	-20.60	peak
5	7440.000	8.40	36.33	53.55	62.67	53.85	74.00	-20.15	peak
6	9920.000	11.18	38.22	53.28	57.01	53.13	74.00	-20.87	peak



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for FYCR2210000432AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for FYCR2210000432AT



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10 Appendix

For right earbuds:

1. Duty Cycle

1.1 Ant1

1.1.1 Test Result

Ant1								
Mode	Tx Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.895	3.751	77.18	1.12	0.03
		2441	DH5	2.895	3.751	77.18	1.12	0.03
		2480	DH5	2.894	3.751	77.15	1.13	0.03
Pi/4DQPSK	SISO	2402	2DH5	2.899	3.750	77.31	1.12	0.07
		2441	2DH5	2.900	3.750	77.33	1.12	0.04
		2480	2DH5	2.900	3.750	77.33	1.12	0.04
8DPSK	SISO	2402	3DH5	0.904	3.750	24.11	6.18	0.06
		2441	3DH5	0.903	3.750	24.08	6.18	0.06
		2480	3DH5	0.903	3.750	24.08	6.18	0.03



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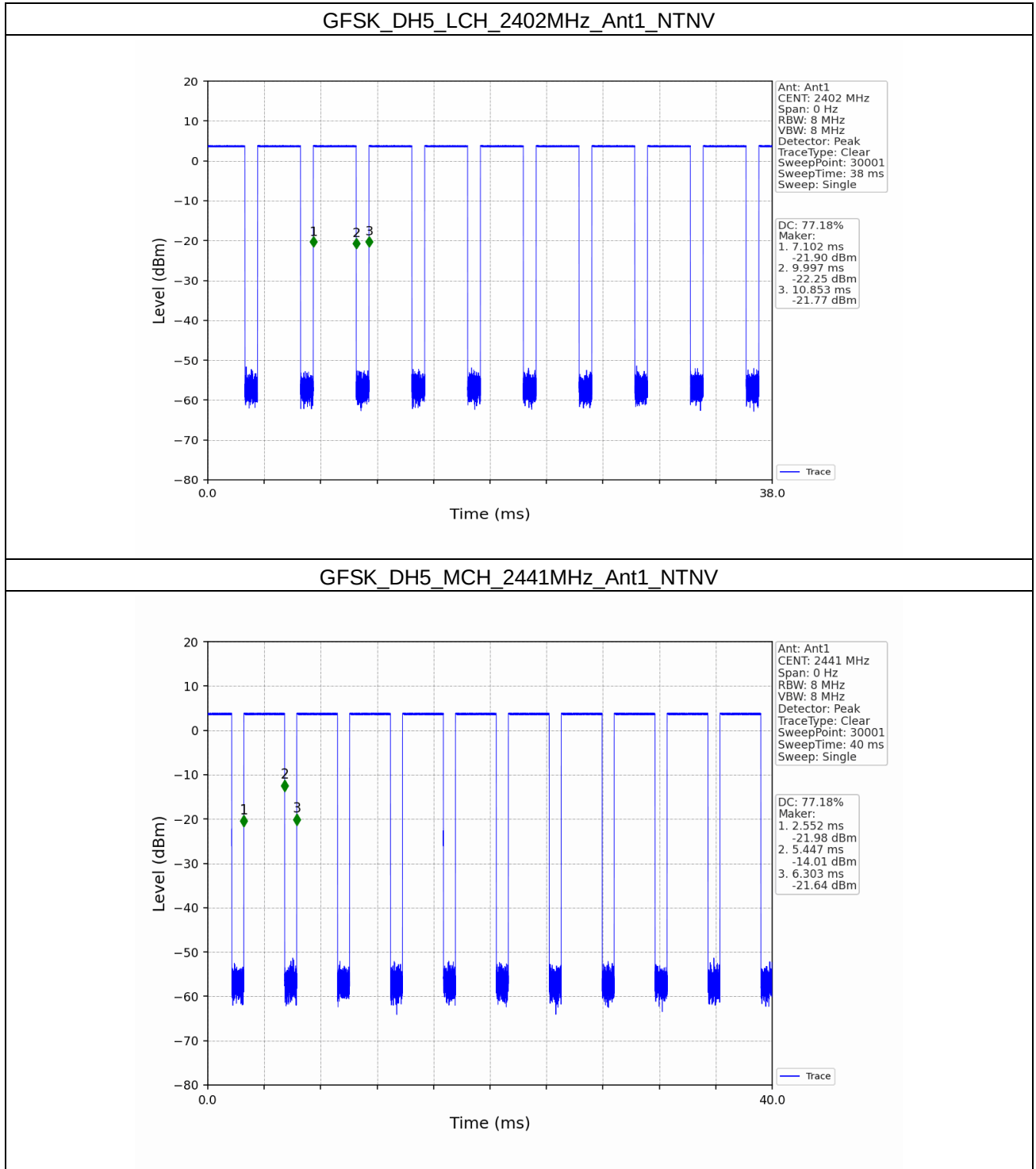
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Page: 60 of 162

1.1.2 Test Graph



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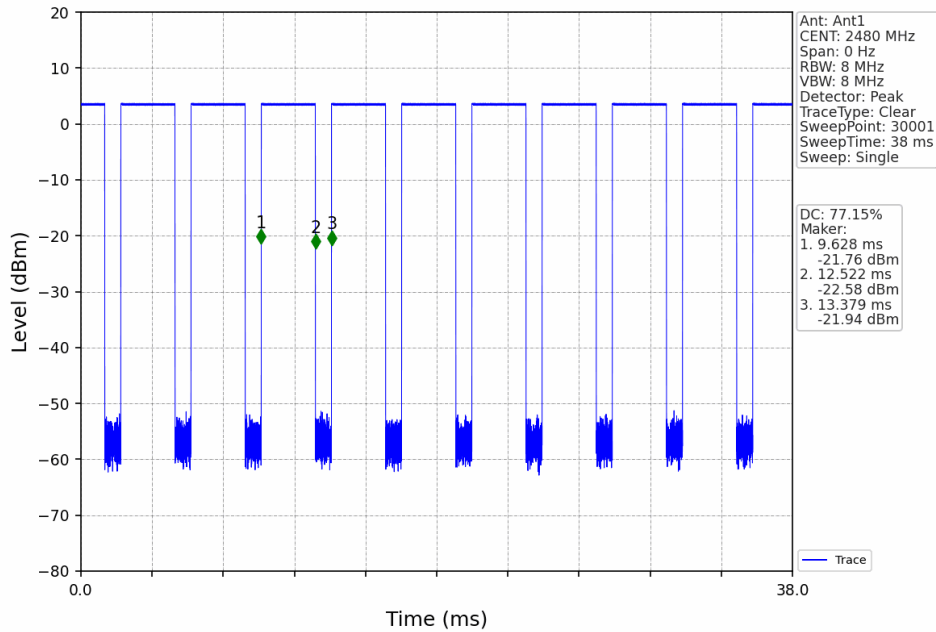
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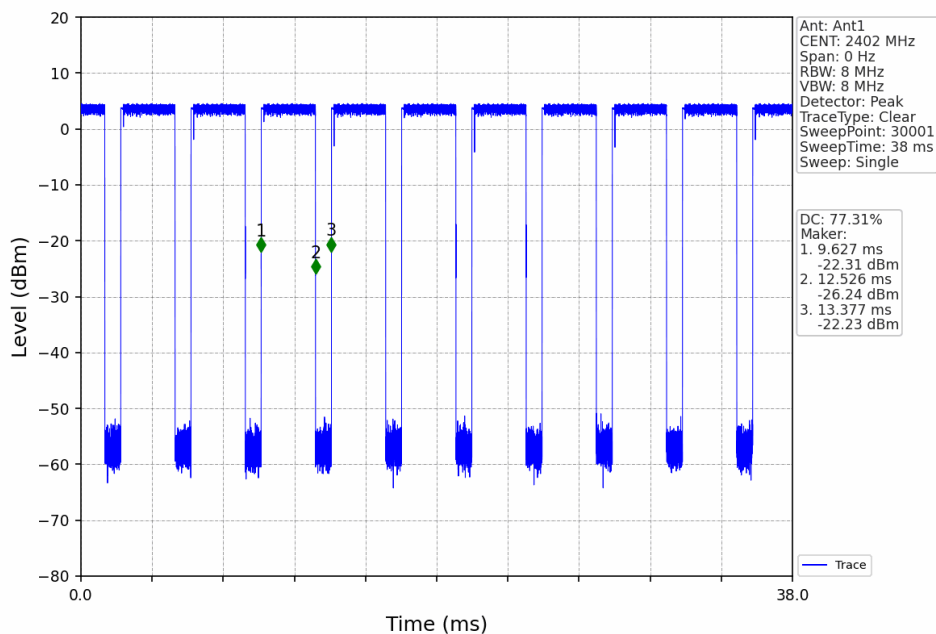
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Page: 61 of 162

GFSK_DH5_HCH_2480MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



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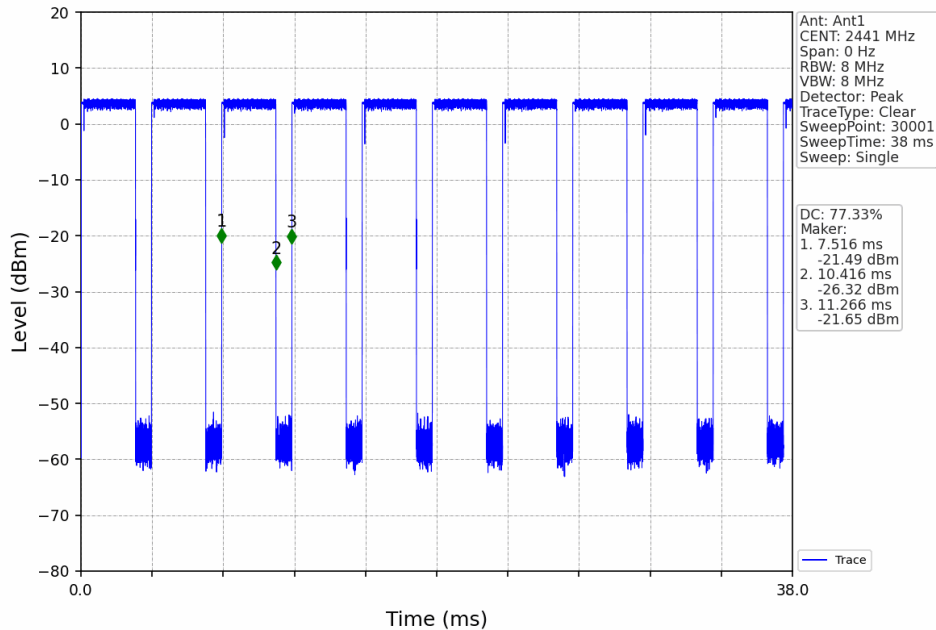
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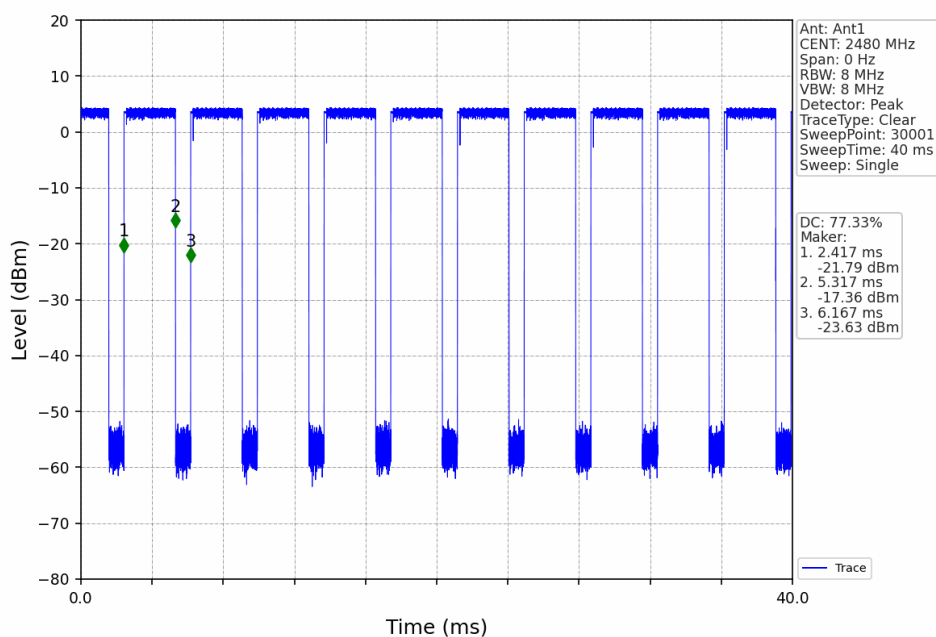
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Page: 62 of 162

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



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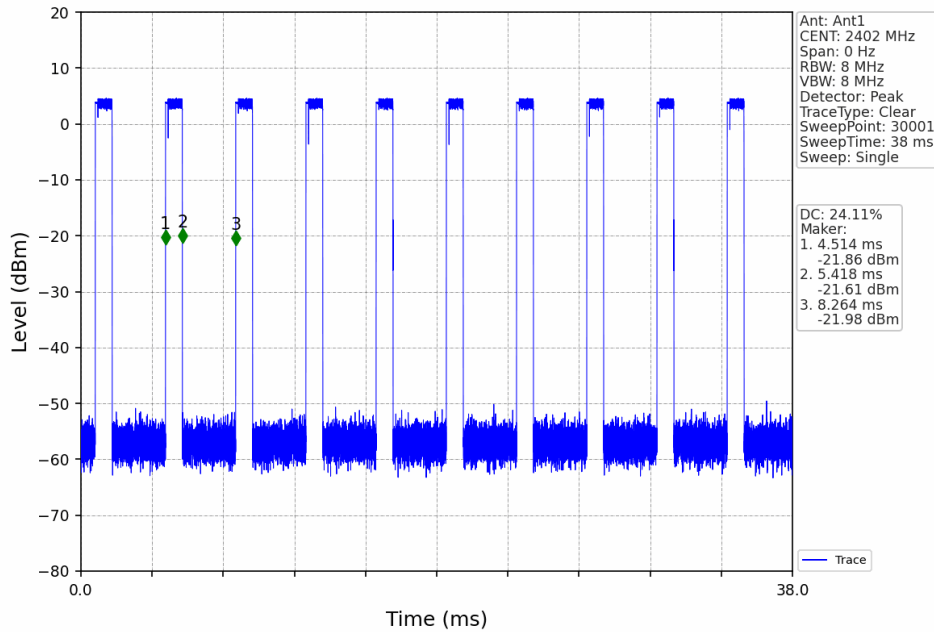
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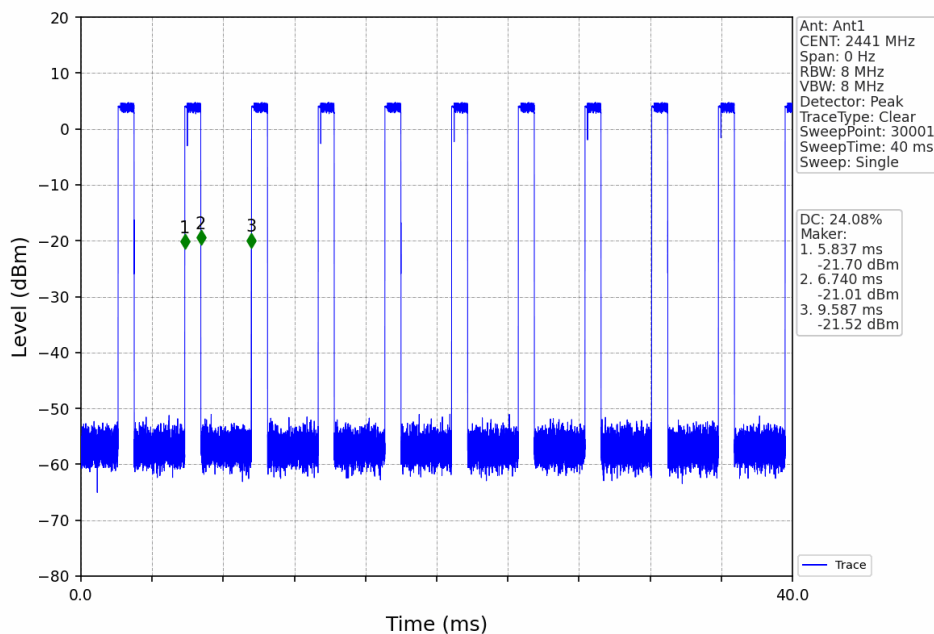
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Page: 63 of 162

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



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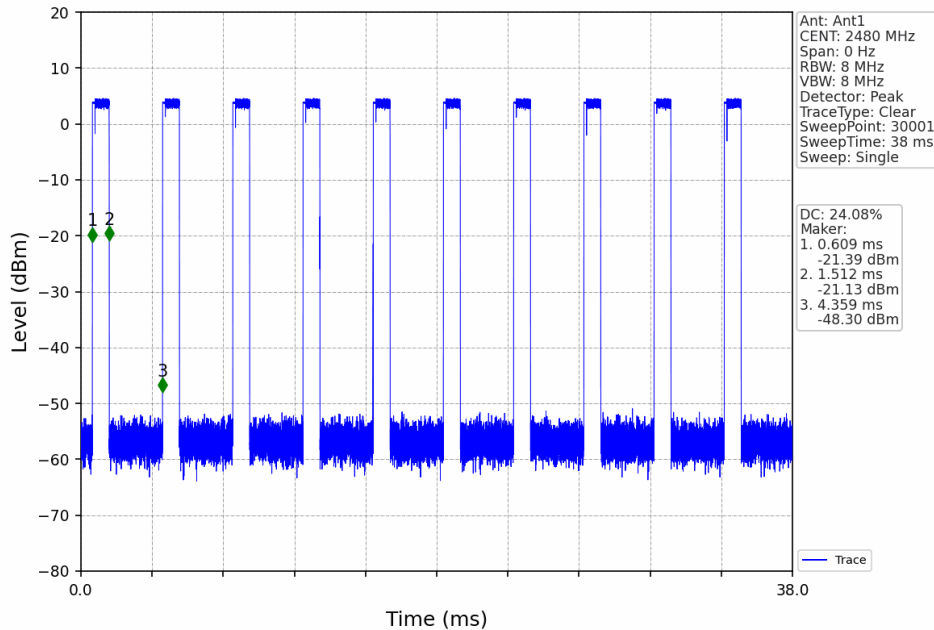
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Page: 64 of 162

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



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

Report No.: FYCR221000043202

Page: 65 of 162

2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.918	Pass
		2441	DH5	1	0.949	Pass
		2480	DH5	1	0.963	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.205	Pass
		2441	2DH5	1	1.231	Pass
		2480	2DH5	1	1.236	Pass
8DPSK	SISO	2402	3DH5	1	1.188	Pass
		2441	3DH5	1	1.214	Pass
		2480	3DH5	1	1.230	Pass



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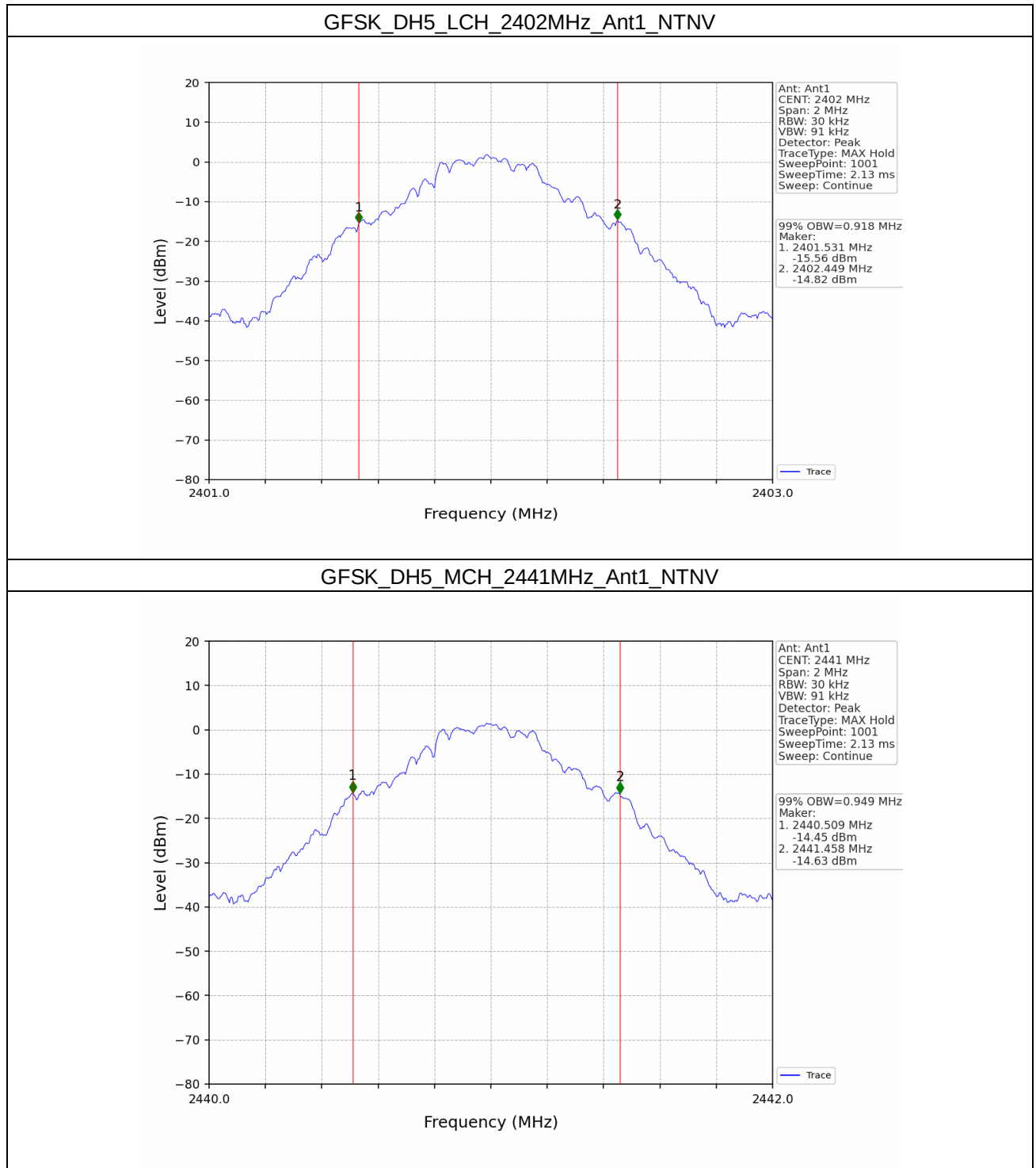
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Report No.: FYCR221000043202

Page: 66 of 162

2.1.2 Test Graph



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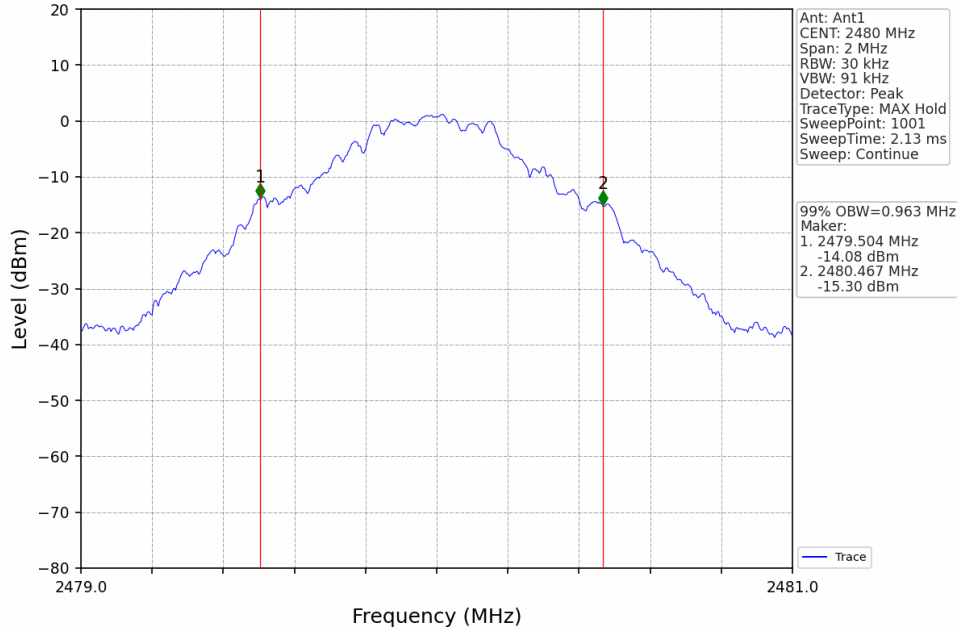
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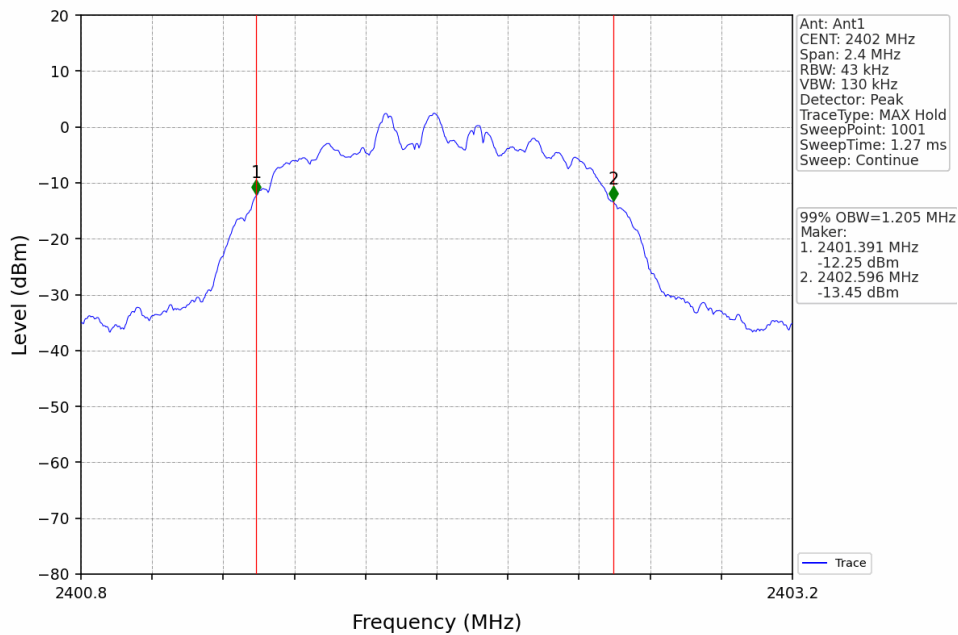
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Page: 67 of 162

GFSK_DH5_HCH_2480MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



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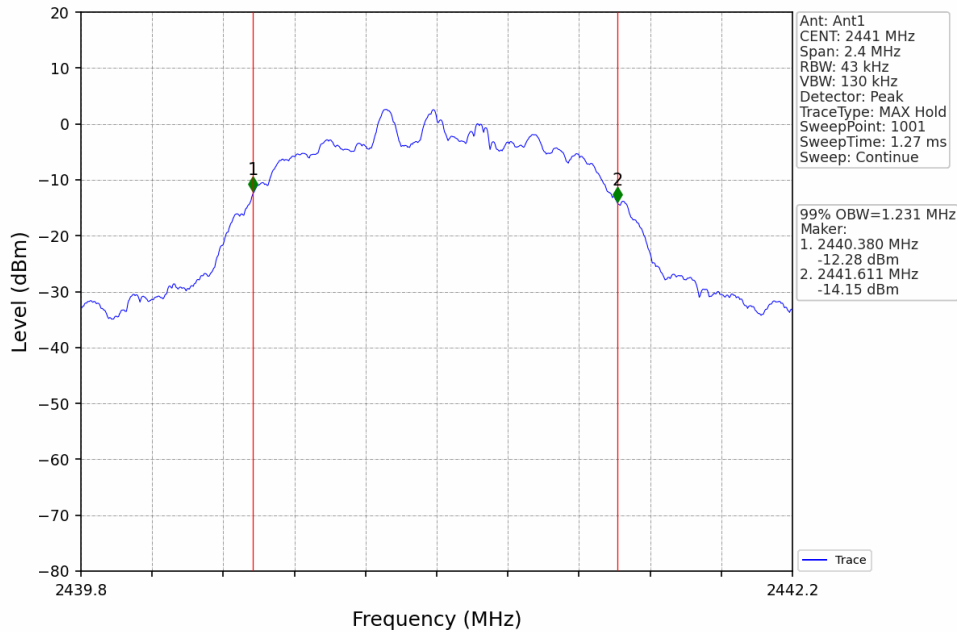
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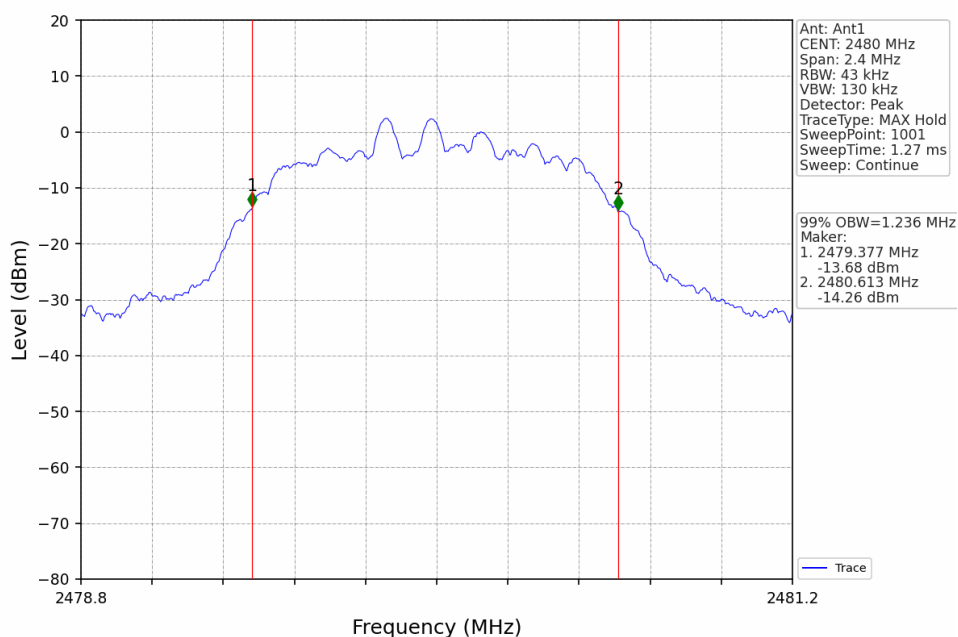
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Page: 68 of 162

Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



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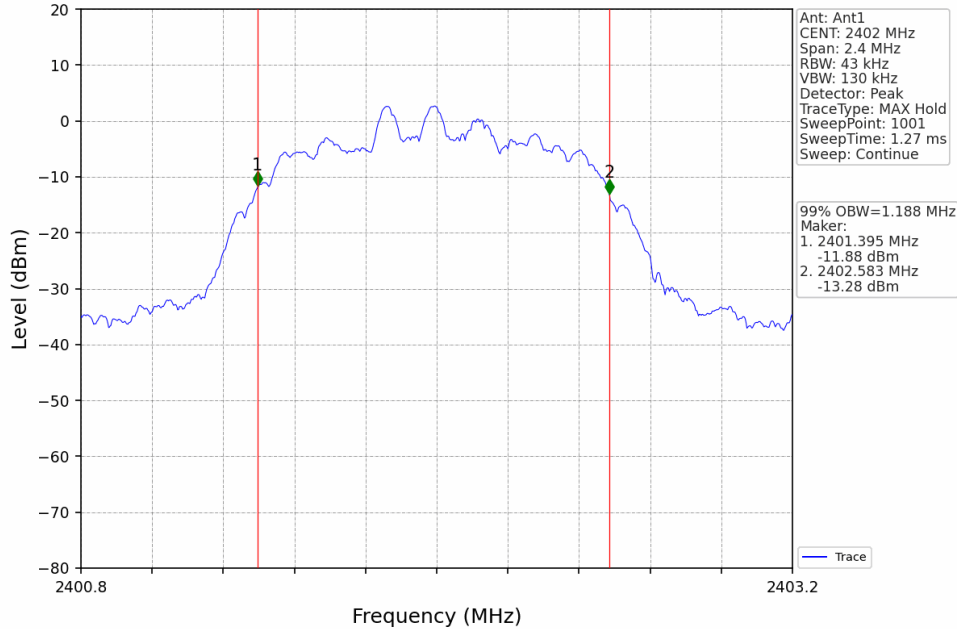
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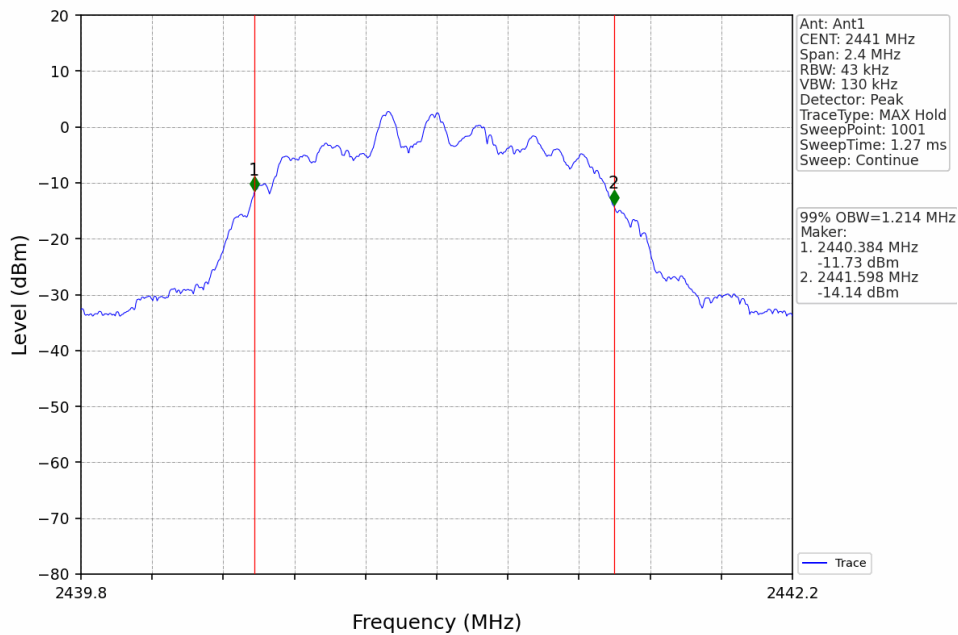
Report No.: FYCR221000043202

Page: 69 of 162

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



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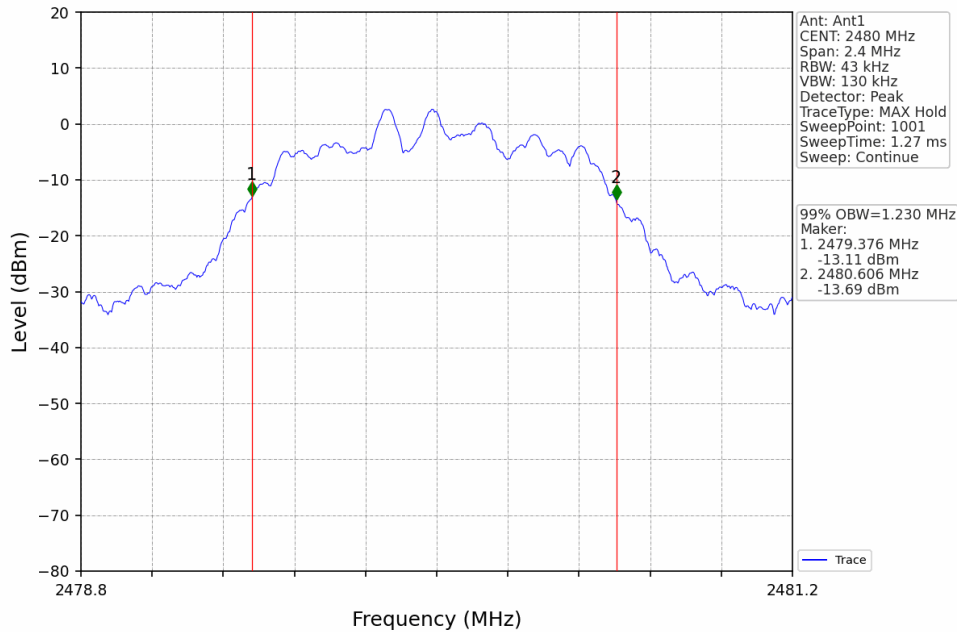
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Page: 70 of 162

8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



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

Report No.: FYCR221000043202

Page: 71 of 162

2.2 20dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	1.030	Pass
		2441	DH5	1	1.041	Pass
		2480	DH5	1	1.066	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.337	Pass
		2441	2DH5	1	1.367	Pass
		2480	2DH5	1	1.371	Pass
8DPSK	SISO	2402	3DH5	1	1.334	Pass
		2441	3DH5	1	1.349	Pass
		2480	3DH5	1	1.376	Pass



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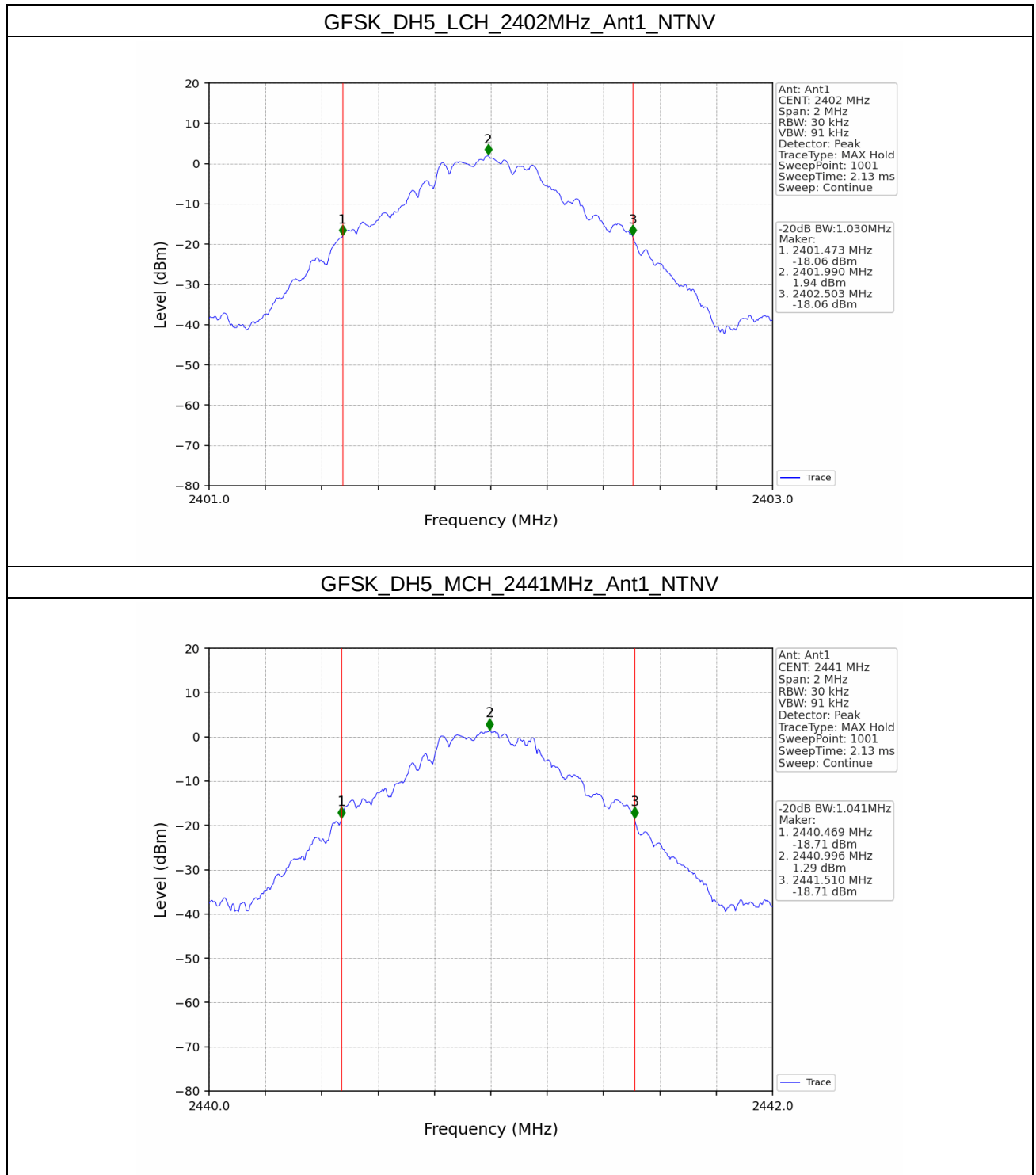
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2.2.2 Test Graph



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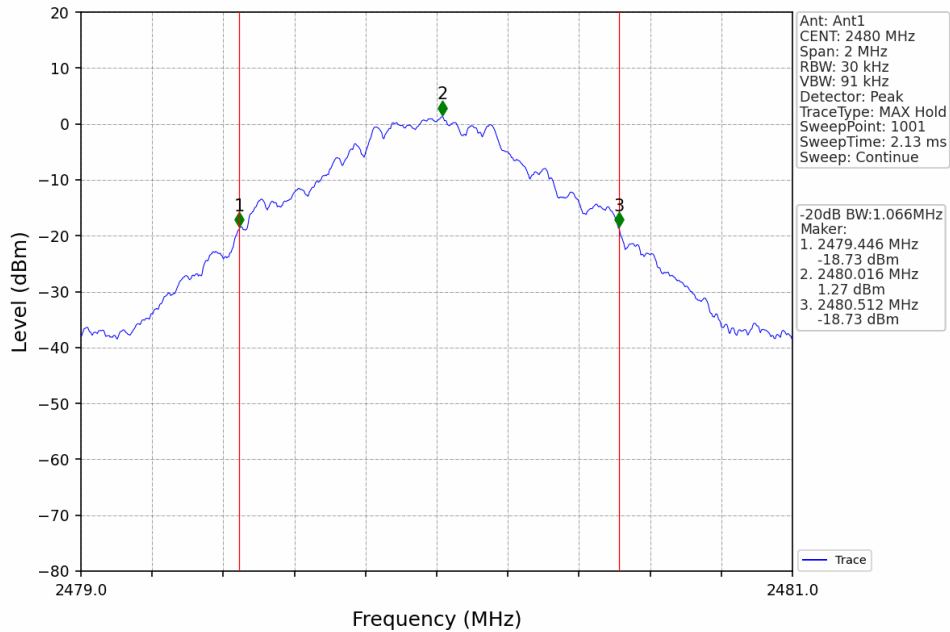
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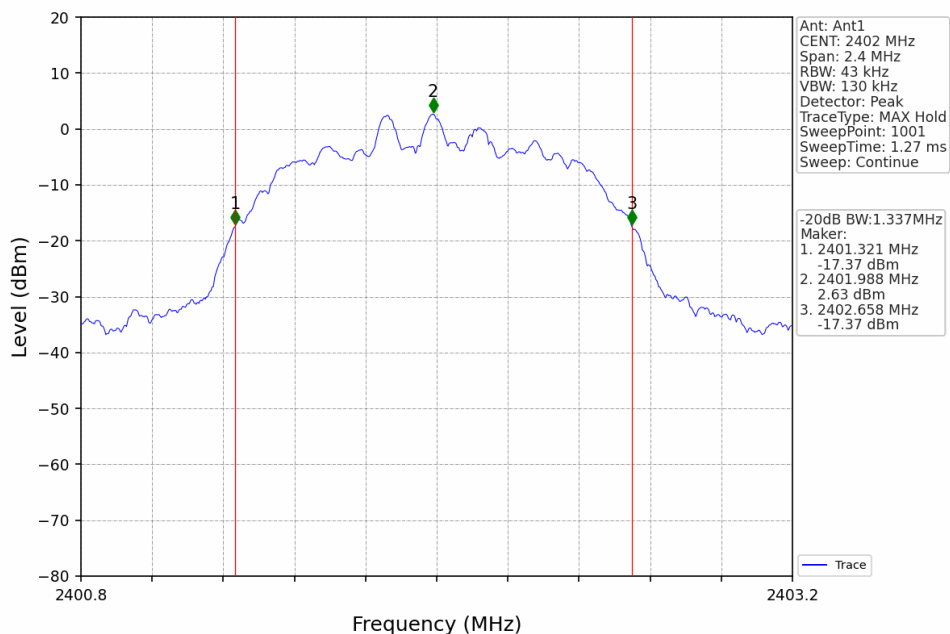
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GFSK_DH5_HCH_2480MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV



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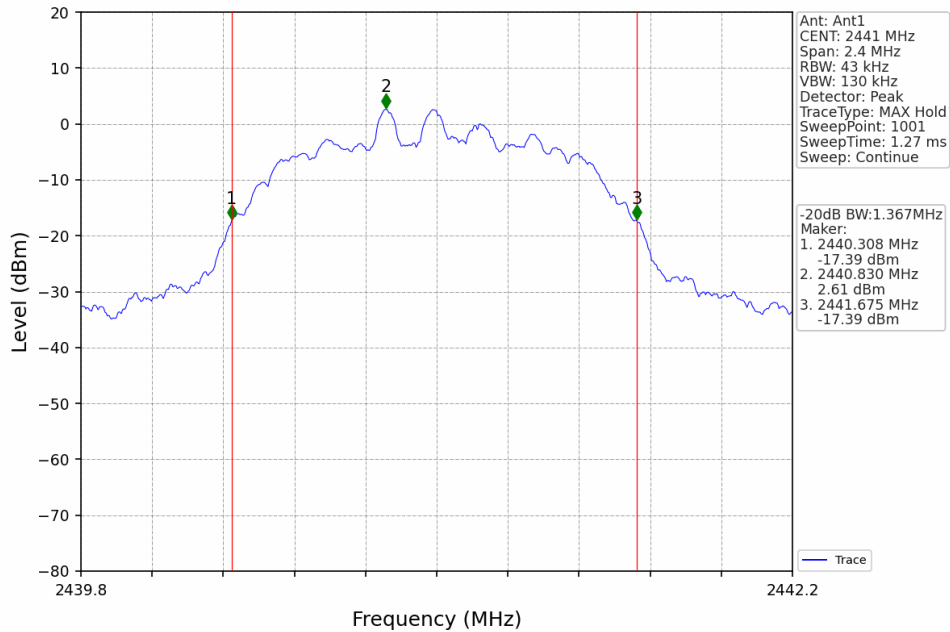
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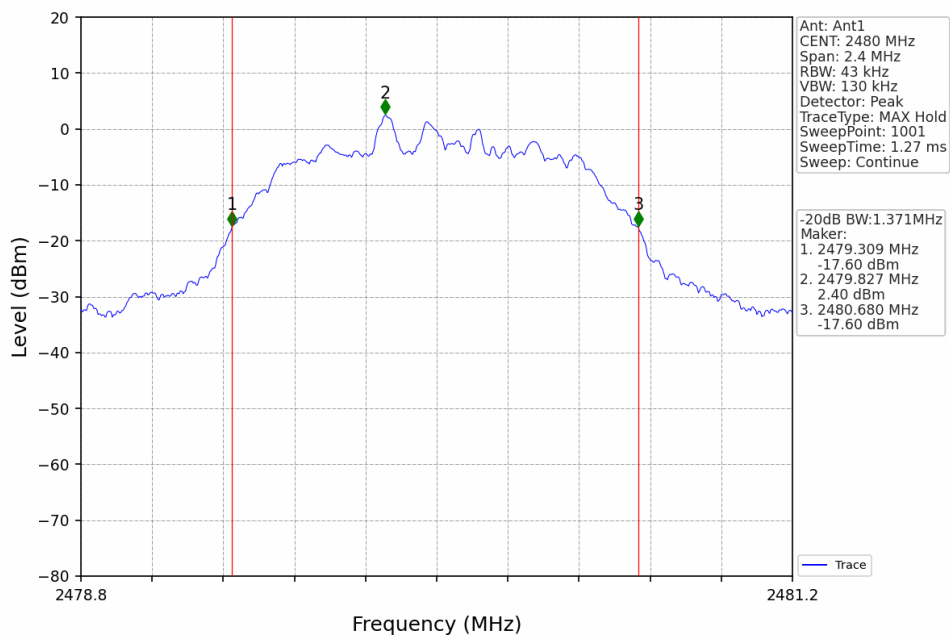
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Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



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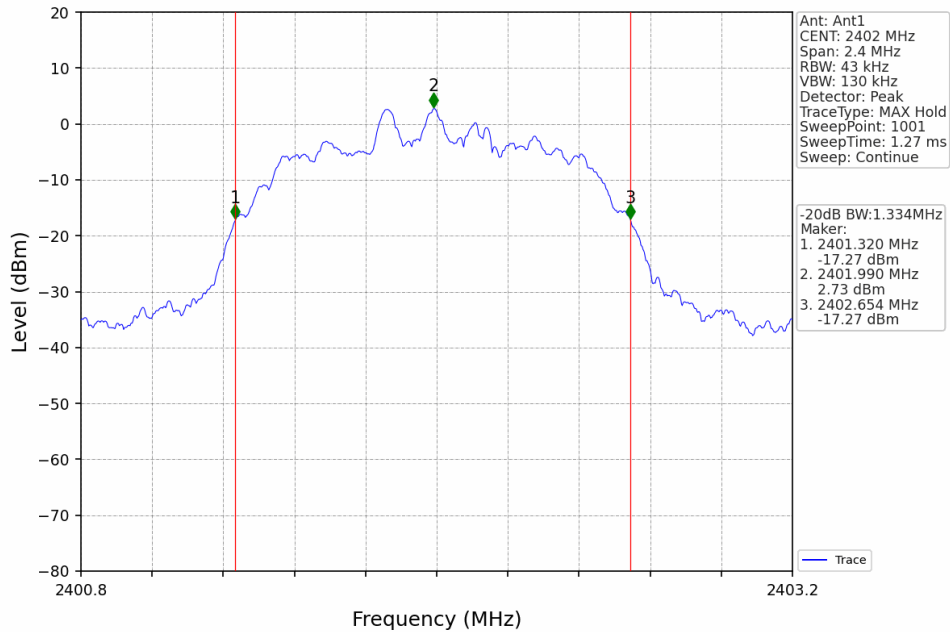
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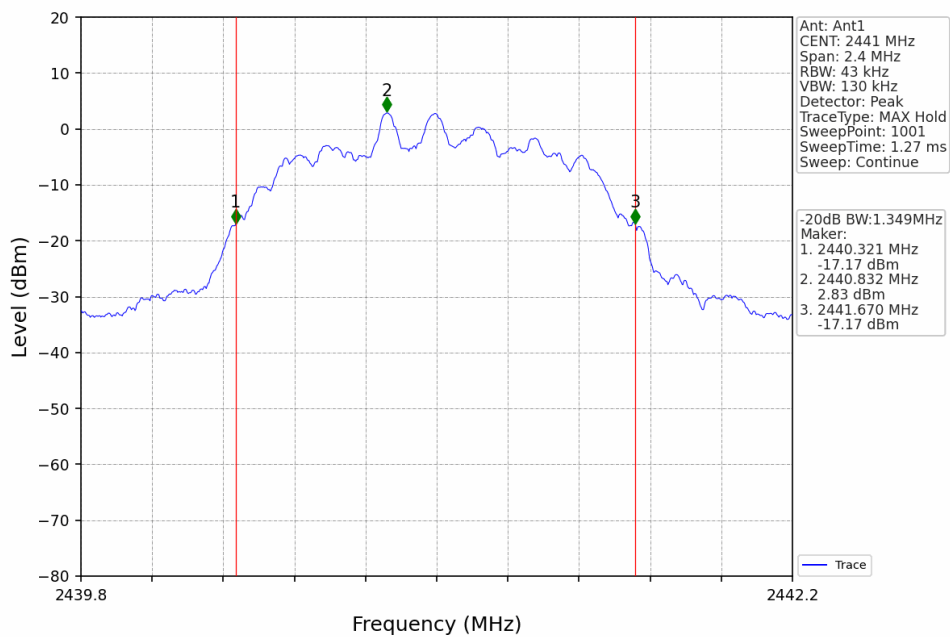
Report No.: FYCR221000043202

Page: 75 of 162

8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



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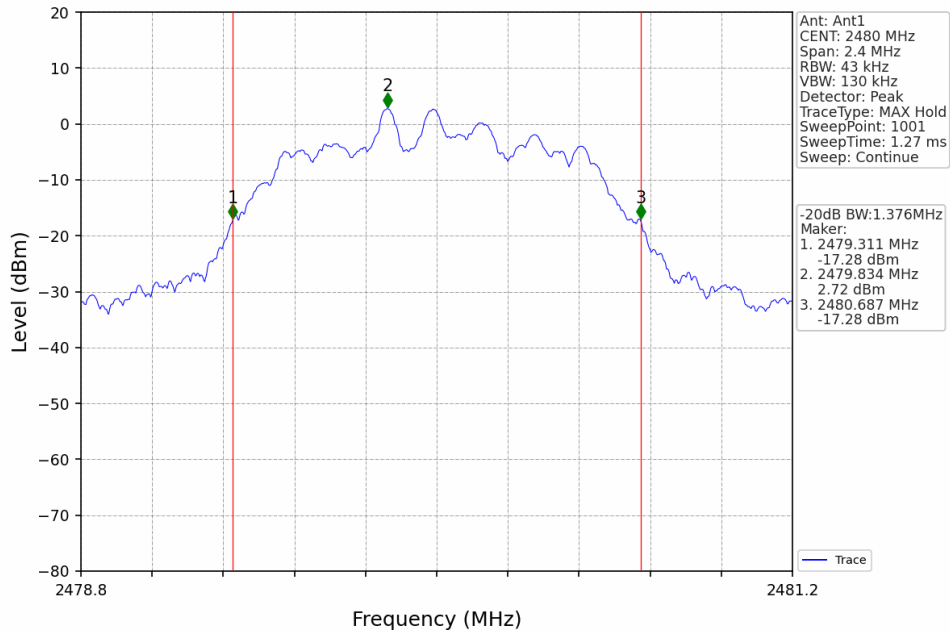
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Report No.: FYCR221000043202

Page: 76 of 162

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Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 77 of 162

3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	3.77	<=20.97	Pass
		2441	DH5	3.81	<=20.97	Pass
		2480	DH5	3.63	<=20.97	Pass
Pi/4DQPSK	SISO	2402	2DH5	4.34	<=20.97	Pass
		2441	2DH5	4.36	<=20.97	Pass
		2480	2DH5	4.18	<=20.97	Pass
8DPSK	SISO	2402	3DH5	4.49	<=20.97	Pass
		2441	3DH5	4.60	<=20.97	Pass
		2480	3DH5	4.44	<=20.97	Pass

4. Carrier Frequency Separation

4.1 Ant1

4.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.016	1.066	>=0.711	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	0.989	1.371	>=0.914	Pass
8DPSK	SISO	HOPP	3DH5	1.008	1.376	>=0.917	Pass



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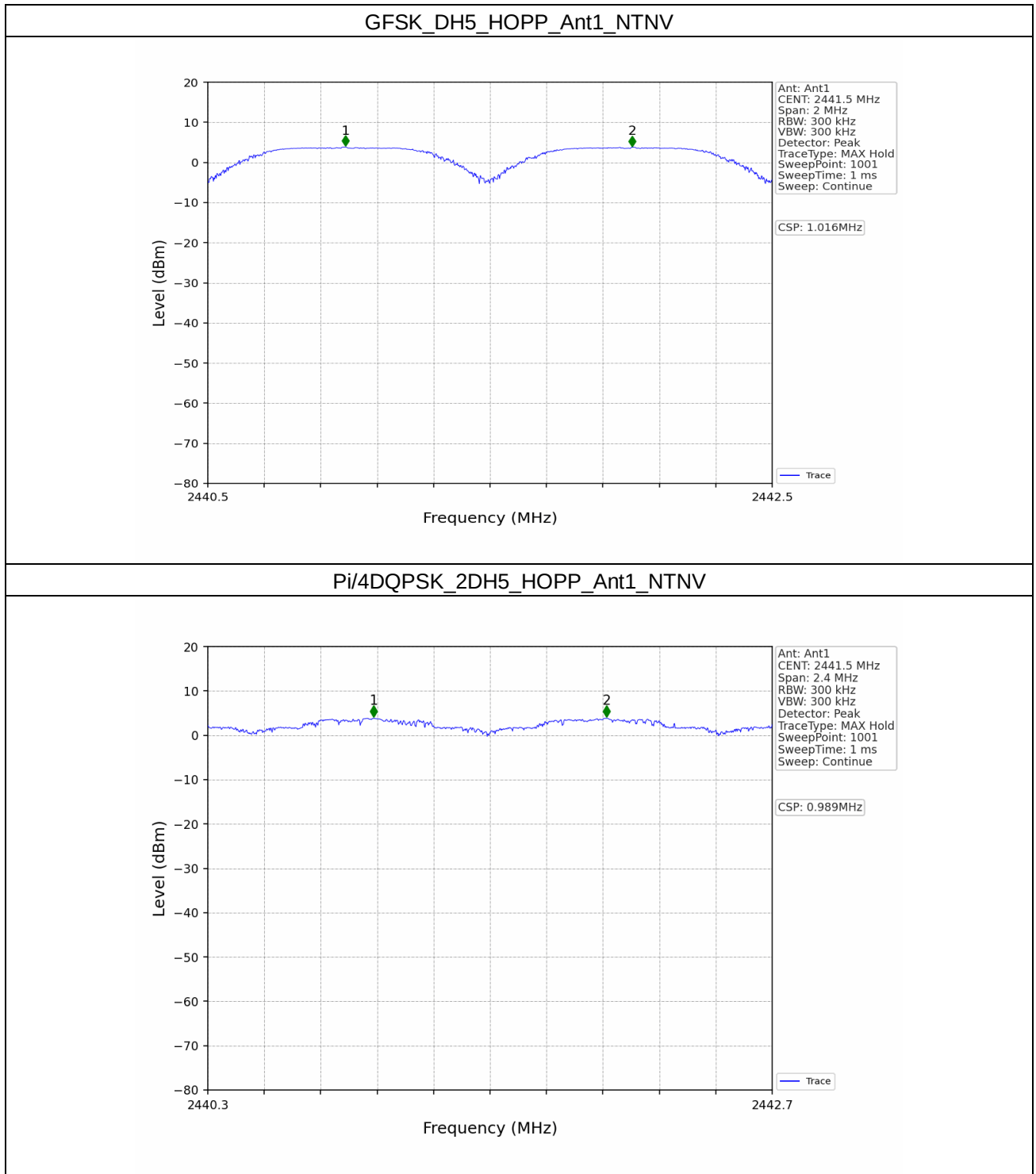
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 78 of 162

4.1.2 Test Graph



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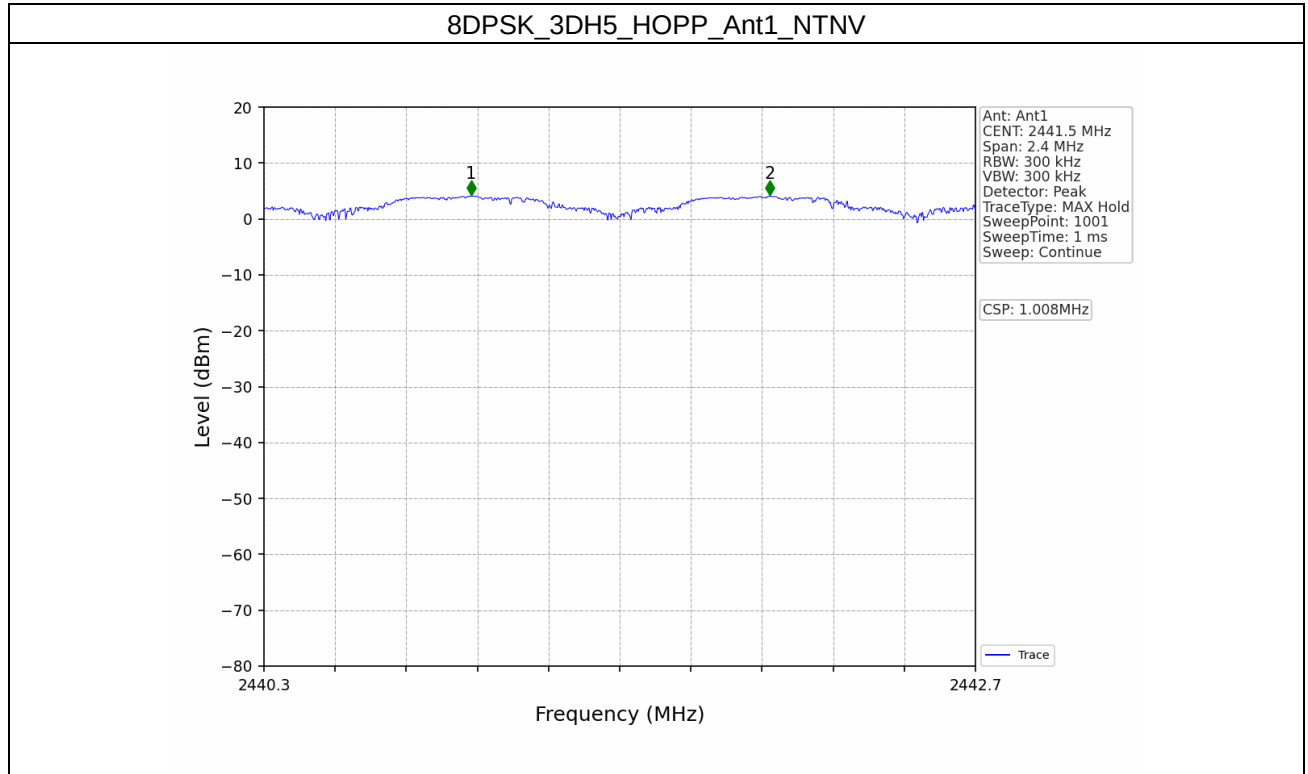
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 79 of 162



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Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 80 of 162

5. Number of Hopping Frequencies

5.1 HoppNum

5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	>=15	Pass
PI/4DQPSK	SISO	HOPP	2DH5	79	>=15	Pass
8DPSK	SISO	HOPP	3DH5	79	>=15	Pass



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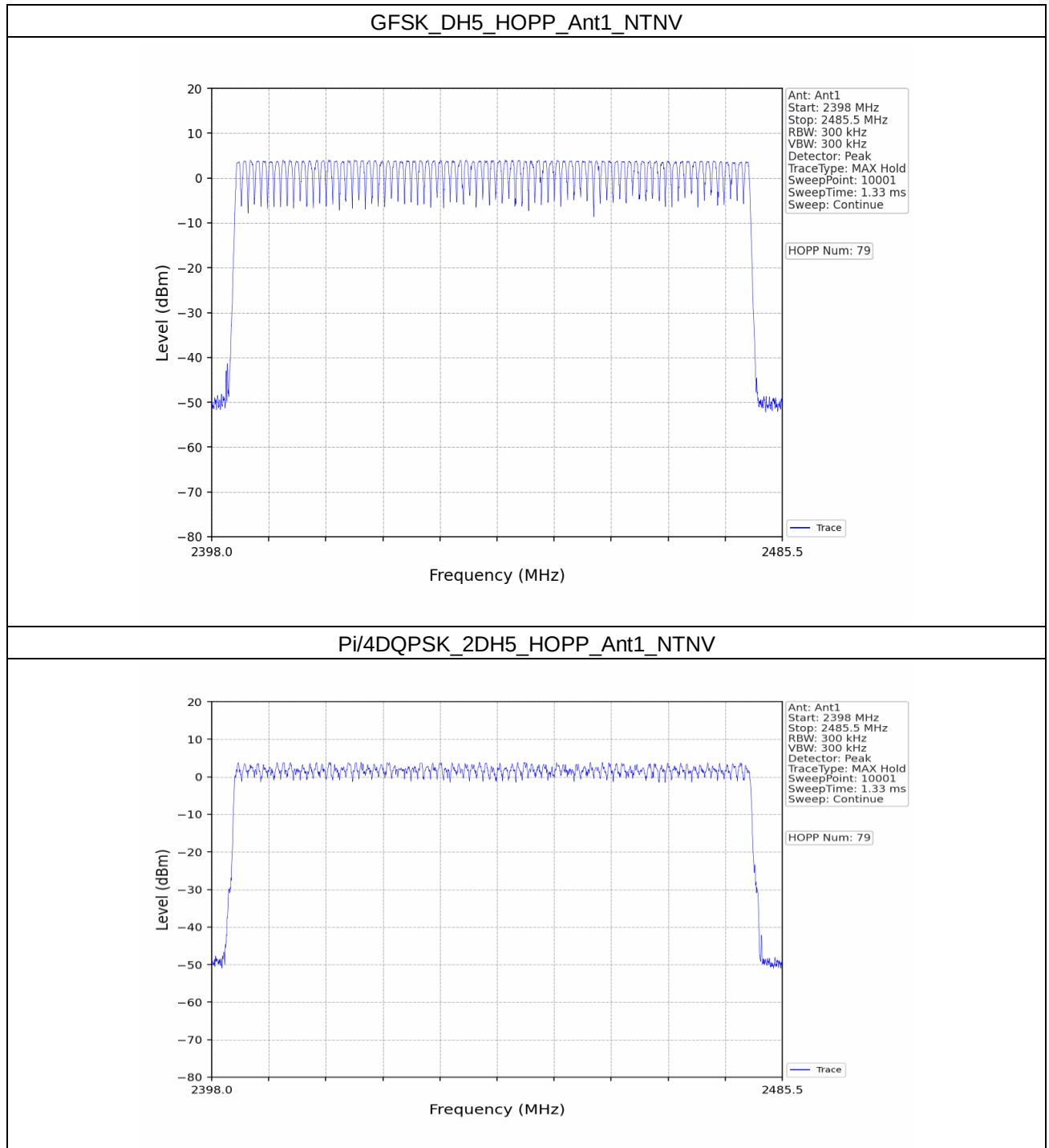
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 81 of 162

5.1.2 Test Graph



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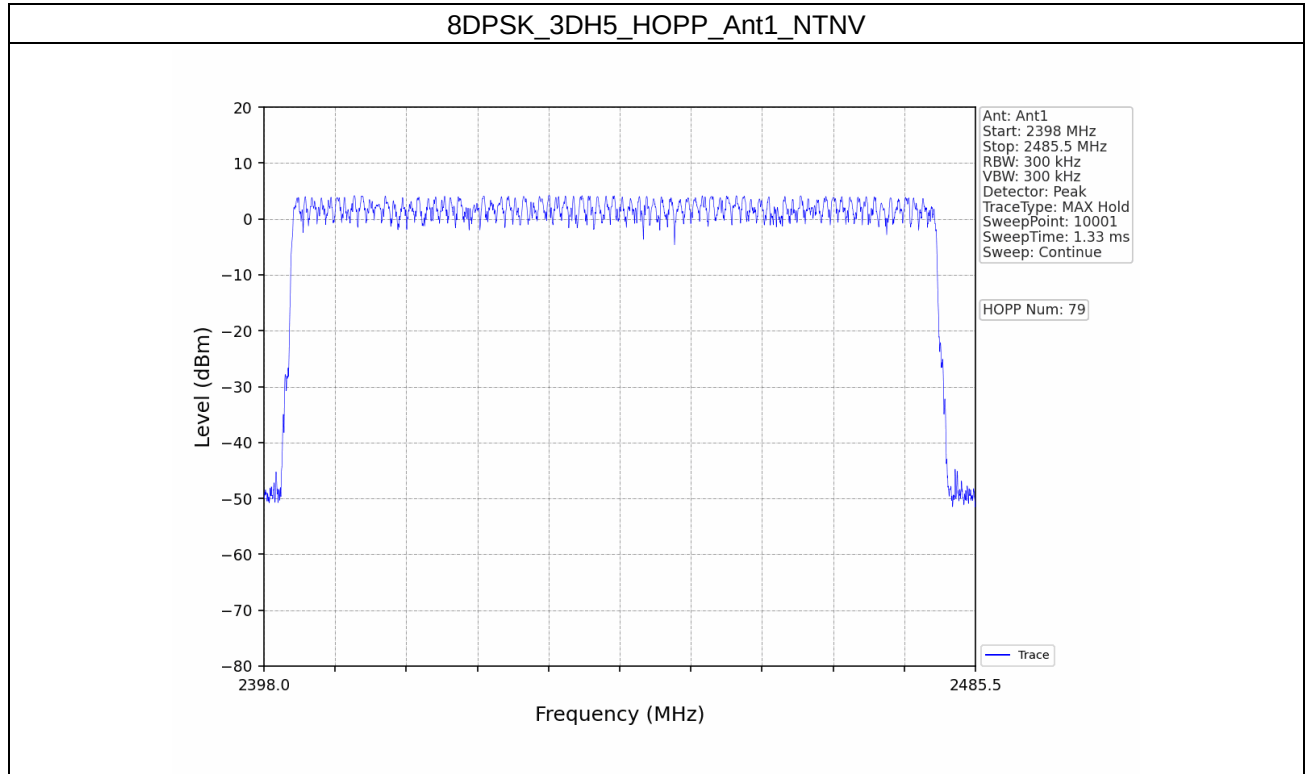
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR221000043202

Page: 82 of 162



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Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR221000043202

Page: 83 of 162

6. Time of Occupancy (Dwell Time)

6.1 Ant1

6.1.1 Test Result

Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.392	31.600	318	124.656	<=400	Pass
			DH3	1.648	31.600	154	253.792	<=400	Pass
			DH5	2.898	31.600	110	318.780	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.396	31.600	320	126.720	<=400	Pass
			2DH3	1.654	31.600	166	274.564	<=400	Pass
			2DH5	2.904	31.600	103	299.112	<=400	Pass
8DPSK	SISO	HOPP	3DH1	6.678	31.600	50	333.900	<=400	Pass
			3DH3	0.654	31.600	153	100.062	<=400	Pass
			3DH5	0.900	31.600	100	90.000	<=400	Pass



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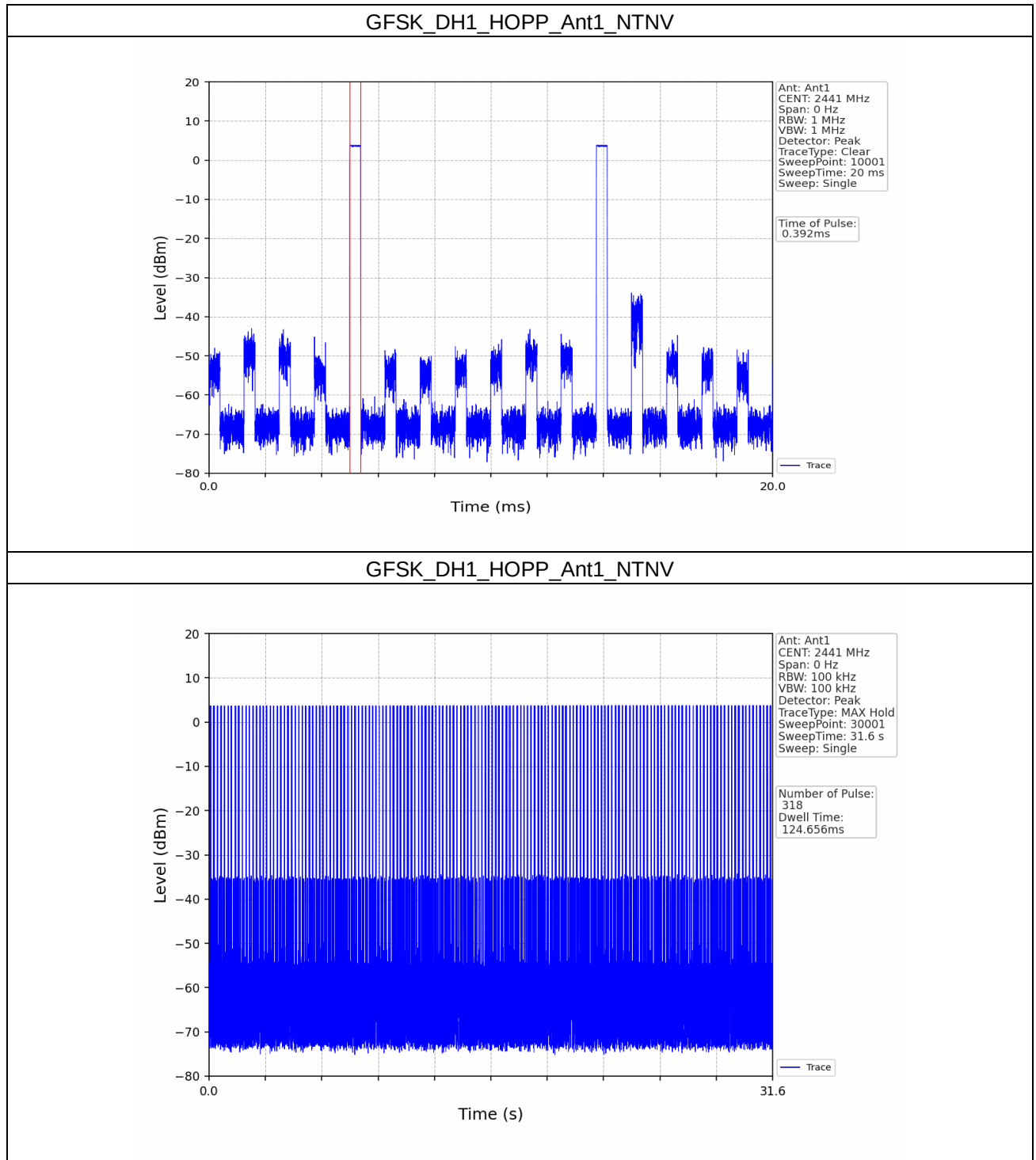
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Report No.: FYCR221000043202

Page: 84 of 162

6.1.2 Test Graph



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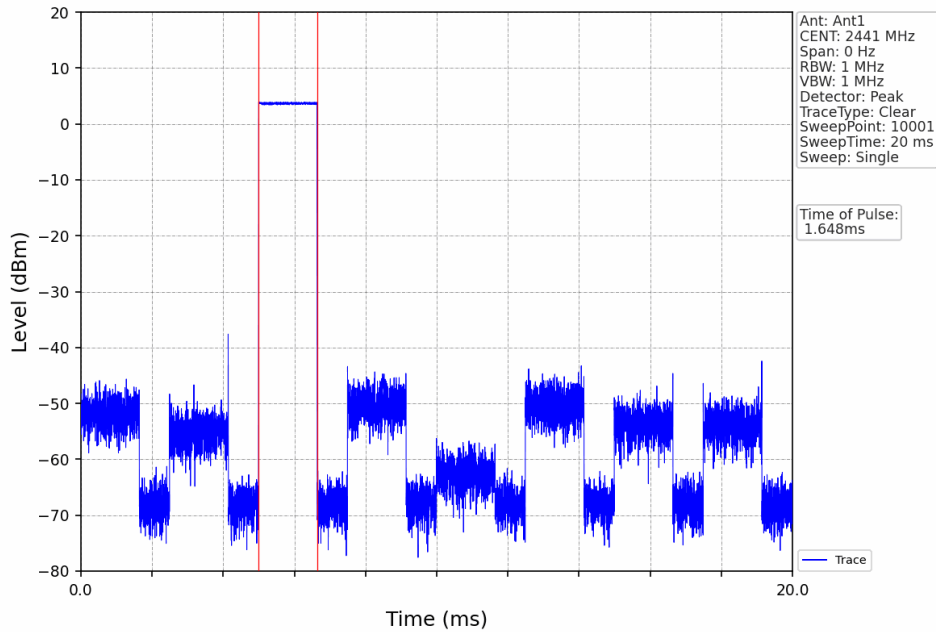
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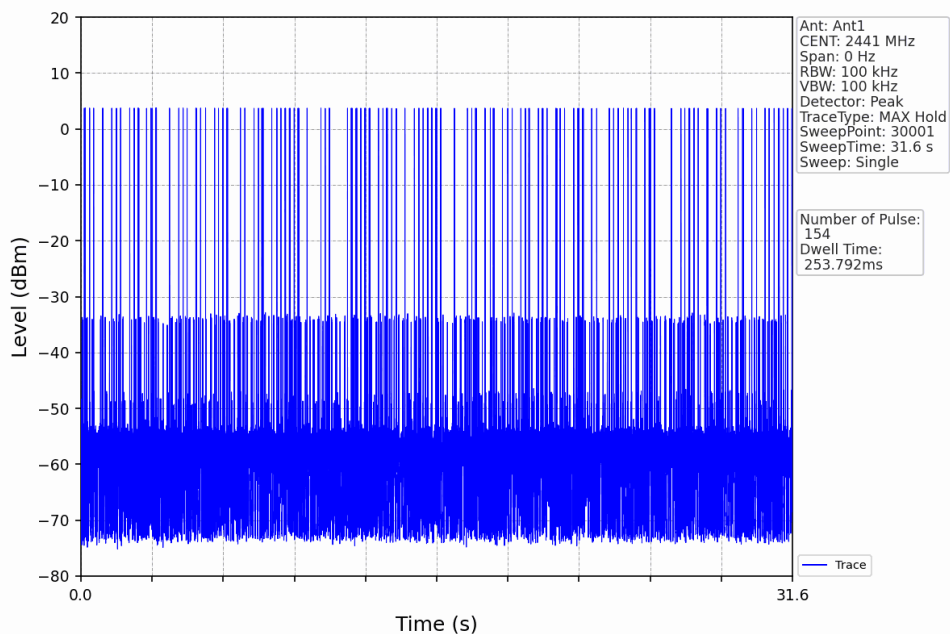
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Page: 85 of 162

GFSK_DH3_HOPP_Ant1_NTNV



GFSK_DH3_HOPP_Ant1_NTNV



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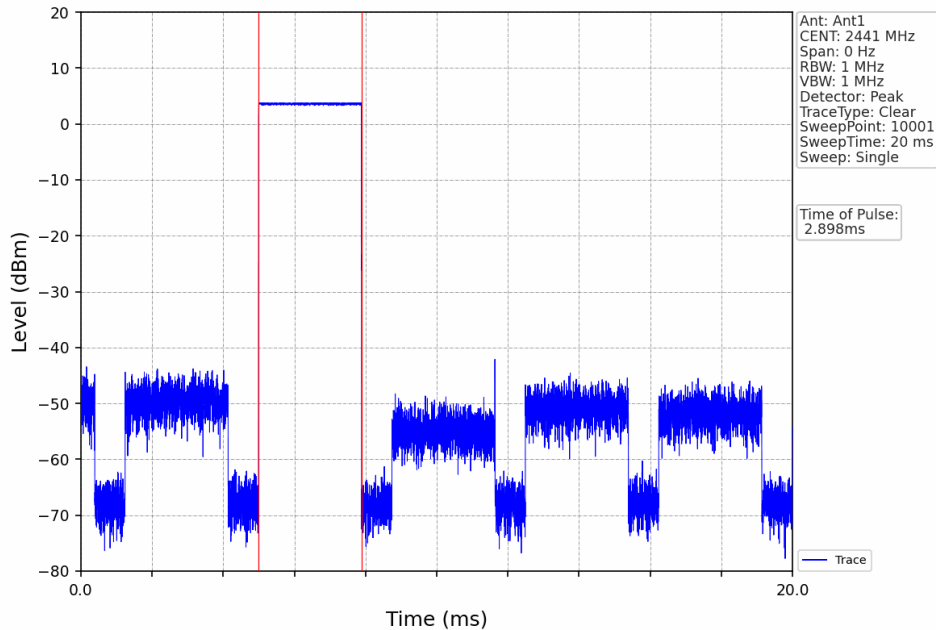
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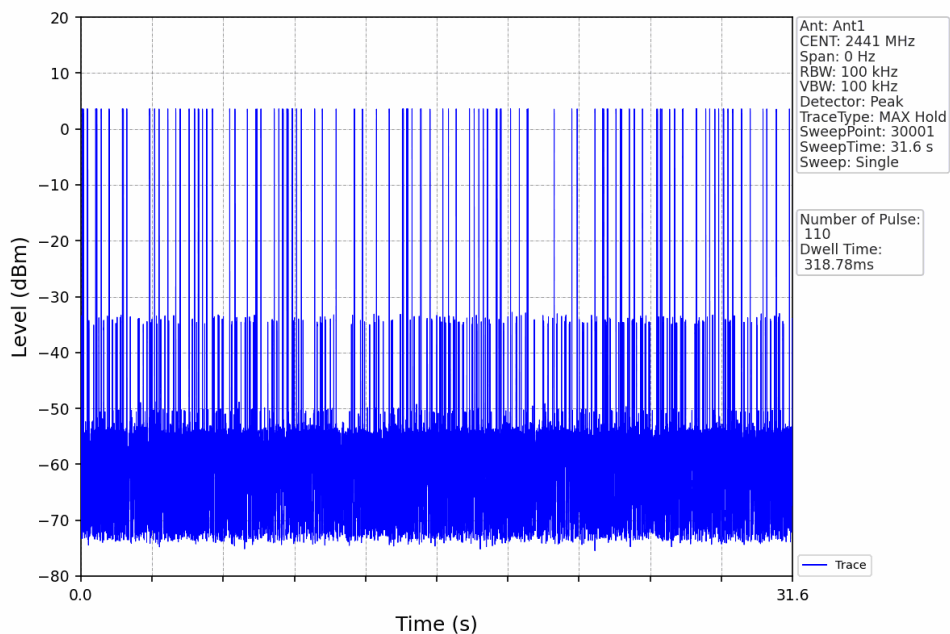
Report No.: FYCR221000043202

Page: 86 of 162

GFSK_DH5_HOPP_Ant1_NTNV



GFSK_DH5_HOPP_Ant1_NTNV



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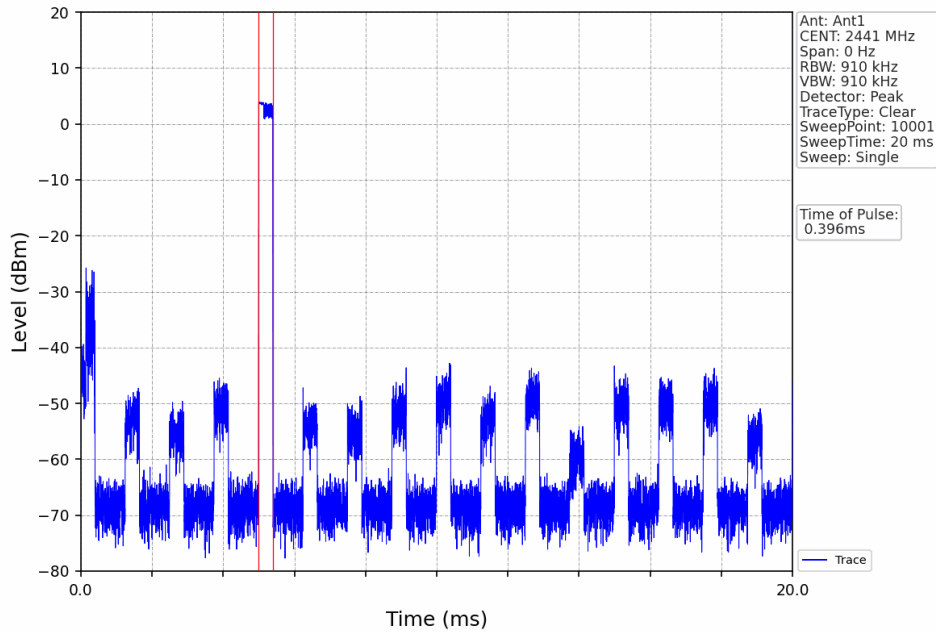
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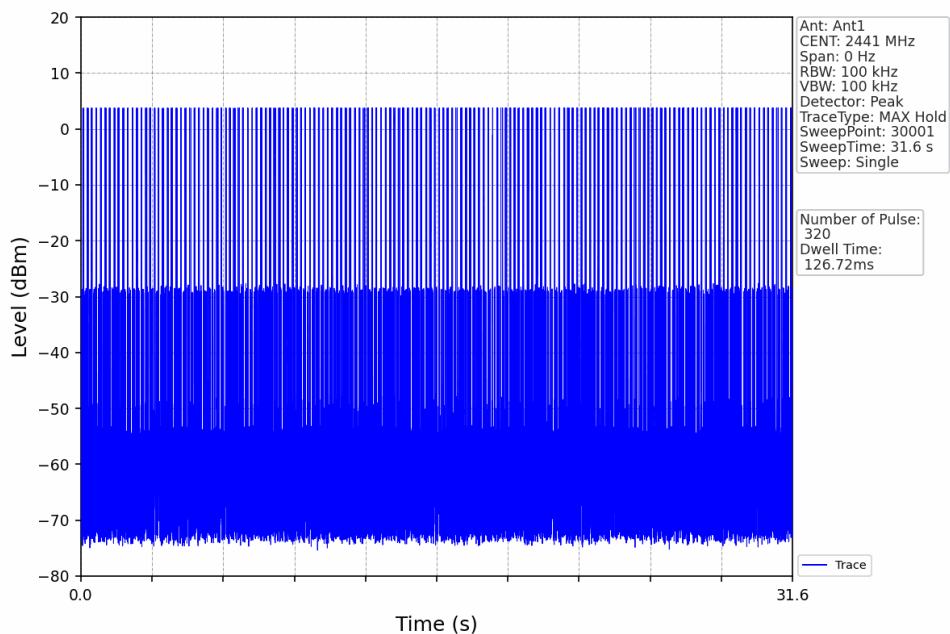
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Page: 87 of 162

Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



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