TEST REPORT

Application No.:	FYCR2204000134AT
Applicant:	Hytera Communications Corporation Limited
Address of Applicant:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, P.R.C., P 518057
Manufacturer:	Hytera Communications Corporation Limited
Address of Manufacturer:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, P.R.C., P 518057
Factory:	Sunrise Simcom (Tong cheng) Limited
Address of Factory:	No.188-1, Nanshan Road, Tongcheng Economic Development Zone, Anqing, Anhui
Equipment Under Test (EUT):	
EUT Name:	5G XSecure Rugged Device
Model No.:	PNC560, PNC560 SCAN ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	Hytera
FCC ID:	YAMPNC560
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2022-04-29
Date of Test:	2022-05-16 to 2022-06-21
Date of Issue:	2022-07-02
Test Result:	**Pass***

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

Winkey Wang
EMC Technical Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2022-07-02		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

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
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		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
Duty Cycle		ANSI C63.10 Section 11.6	ANSI C63.10 Section 11.6	Pass

Declaration of EUT Family Grouping:

Model No.: PNC560, PNC560 SCAN

Only the model PNC560 SCAN was fully tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used, internal wiring and functions were identical for all the above models, with only difference on SCAN camera for PNC560 SCAN and emergency call button for PNC560.

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC3.85V by Li-ion battery Recharged by AC/DC power adapter Adapter M/N: TPA-10R120150UU01 Adapter input: AC100-240V, 50/60Hz, 0.6A Adapter output: DC3.6-6V/3A, 6-9V/2A, 9-12V/1.5A
Cable(s):	USB Type C cable: 1m shielded cable without ferrite core
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.1 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	-0.5dBi

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 Emissions at AC Power Line (150kHz-30MHz)	± 2.1 dB (9kHz to 30MHz)
Conducted Peak Output Power	± 0.8dB
Minimum 6dB Bandwidth	± 0.3%
Power Spectrum Density	± 0.4dB
Conducted Band Edges Measurement	± 2.7dB
Conducted Spurious Emissions	± 2.7dB
Radiated Emissions which fall in the restricted bands	± 4.4dB (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	± 3.1dB (Below 1GHz)
Radiated Spurious Emissions Above 1GHz	± 4.4dB (Above 1GHz)
Duty Cycle	± 0.3%

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4.4 Test Location

All tests were performed at:

Compliance Certification Services（Kunshan）Inc. Shenzhen branch.

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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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Shielding Room	CRT	N/A	SEM001-14	2021/7/13	2024/7/12
EMI Test Receiver(9kHz-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2021/7/13	2022/7/12
Two-Line V-Network(9kHz-30MHz)	Rohde & Schwarz	ENV216	SEM007-16	2021/7/13	2022/7/12
Two-Line V-Network(9kHz-30MHz)	Rohde & Schwarz	ESH3-Z5	SEM007-22	2021/7/13	2022/7/12

Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

Power Spectrum Density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

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Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
Biconical Antenna	Schwarzbeck	VUBA9117	SEM003-35	2021/12/26	2024/12/25
Loop Antenna	ETS-LINDGREN	6502	SEM003-36	2021/9/26	2024/9/25
Pre-amplifier	HP	8447D	SEM005-02	2021/7/13	2022/7/12
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
Double-ridged waveguide horn	ETS-LINDGREN	3117	SEM003-34	2021/9/25	2024/9/24
Spectrum Analyzer	Rohde & Schwarz	101288	SEM004-08	2021/7/13	2022/7/12
Low Noise Amplifier	CLAVIIO	BDLNA-0118-352810	SEM005-05	2021/7/13	2022/7/12
Pre-amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2021/7/13	2022/7/12
Pre-amplifier	Rohde & Schwarz	CH14-H052	SEM005-17	2021/7/13	2022/7/12

Radiated Spurious Emissions Below 1GHz					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
Loop Antenna	ETS-LINDGREN	6502	SEM003-36	2021/9/26	2024/9/25
MXE EMI receiver	Agilent	N9038A	SEM004-05	2021/7/13	2022/7/12
Pre-amplifier	HP	8447D	SEM005-02	2021/7/13	2022/7/12
Spectrum Analyzer	Rohde & Schwarz	101288	SEM004-08	2021/7/13	2022/7/12
Low Noise Amplifier	CLAVIIO	BDLNA-0118-352810	SEM005-05	2021/7/13	2022/7/12

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Radiated Spurious Emissions Above 1GHz					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Pre-amplifier	HP	8447D	SEM005-02	2021/7/13	2022/7/12
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
Double-ridged waveguide horn	ETS-LINDGREN	3117	SEM003-34	2021/9/25	2024/9/24
Spectrum Analyzer	Rohde & Schwarz	101288	SEM004-08	2021/7/13	2022/7/12
Low Noise Amplifier	CLAVIIO	BDLNA-0118-352810	SEM005-05	2021/7/13	2022/7/12
Pre-amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2021/7/13	2022/7/12
Pre-amplifier	Rohde & Schwarz	CH14-H052	SEM005-17	2021/7/13	2022/7/12

Duty Cycle					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-22	2021-07-13	2022-07-12
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-23	2021-07-13	2022-07-12
Barometer	DUMAI	DYM3	SEM002-24	2021-07-13	2022-07-12

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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)

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 -0.5 dBi.

Antenna location: Refer to internal photo.

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7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207
Test Method: ANSI C63.10 (2013) Section 6.2
Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz		

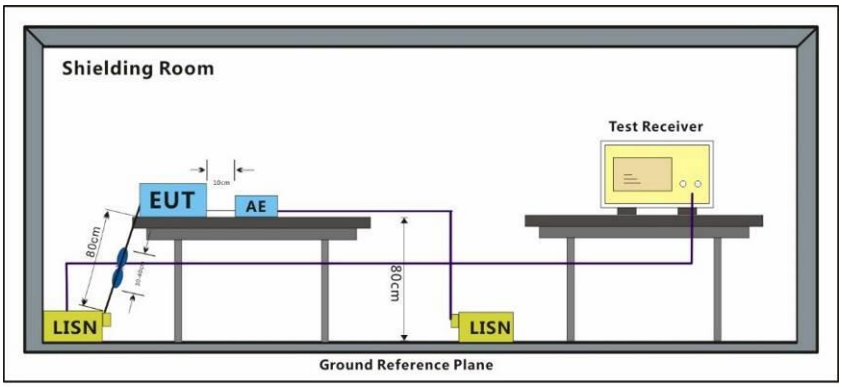
7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 20.4 °C Humidity: 51.6 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	Charge + TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Pre-scan	06	Charge + TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.1.3 Test Setup Diagram



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7.1.4 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor

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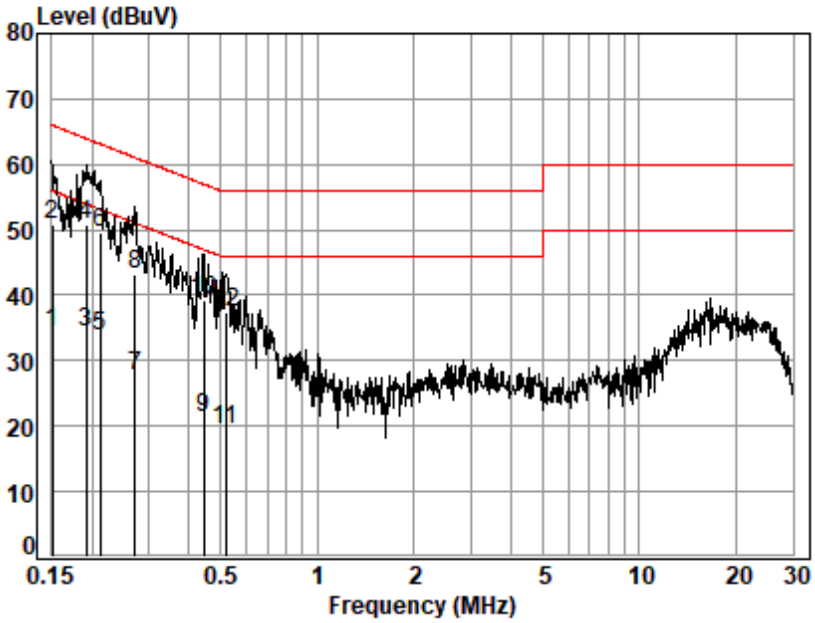
Test Mode: 05; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 00134AT
Test mode: 05

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1510	0.09	0.18	34.25	34.52	55.94	-21.42	Average
2	0.1510	0.09	0.18	50.57	50.84	65.94	-15.10	QP
3	0.1914	0.10	0.16	33.97	34.23	53.98	-19.75	Average
4	0.1914	0.10	0.16	50.60	50.86	63.98	-13.12	QP
5	0.2117	0.10	0.15	33.63	33.88	53.14	-19.26	Average
6	0.2117	0.10	0.15	49.43	49.68	63.14	-13.46	QP
7	0.2715	0.08	0.15	27.50	27.73	51.07	-23.34	Average
8	0.2715	0.08	0.15	43.00	43.23	61.07	-17.84	QP
9	0.4444	0.08	0.16	20.93	21.17	46.98	-25.81	Average
10	0.4444	0.08	0.16	38.87	39.11	56.98	-17.87	QP
11	0.5182	0.10	0.16	19.16	19.42	46.00	-26.58	Average
12	0.5182	0.10	0.16	37.07	37.33	56.00	-18.67	QP

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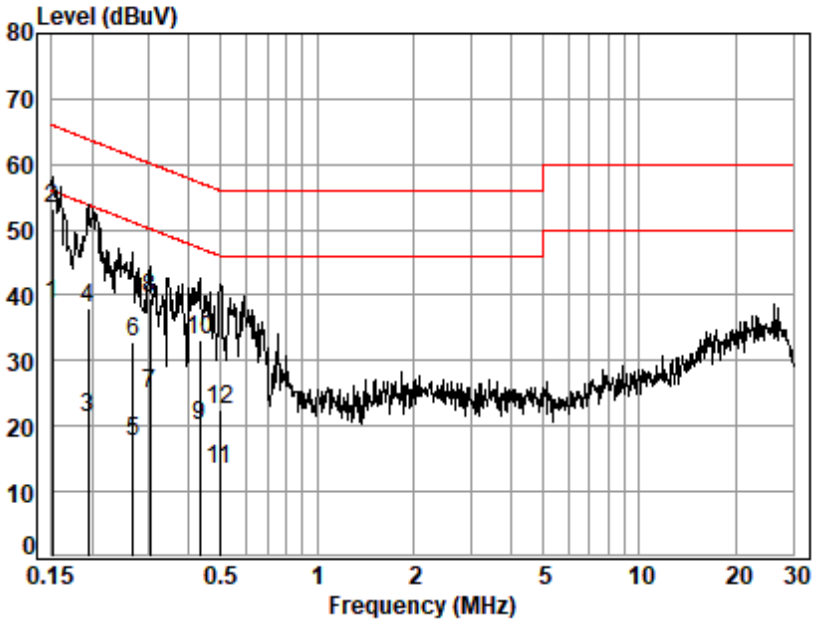
Test Mode: 05; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 00134AT
Test mode: 05

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1508	0.09	0.19	38.41	38.69	55.96	-17.27	Average
2	0.1508	0.09	0.19	52.83	53.11	65.96	-12.85	QP
3	0.1945	0.10	0.18	20.93	21.21	53.84	-32.63	Average
4	0.1945	0.10	0.18	37.83	38.11	63.84	-25.73	QP
5	0.2687	0.09	0.18	17.33	17.60	51.16	-33.56	Average
6	0.2687	0.09	0.18	32.50	32.77	61.16	-28.39	QP
7	0.3019	0.08	0.18	24.76	25.02	50.19	-25.17	Average
8	0.3019	0.08	0.18	39.17	39.43	60.19	-20.76	QP
9	0.4328	0.07	0.19	19.93	20.19	47.20	-27.01	Average
10	0.4328	0.07	0.19	32.99	33.25	57.20	-23.95	QP
11	0.4994	0.10	0.19	13.19	13.48	46.01	-32.53	Average
12	0.4994	0.10	0.19	22.36	22.65	56.01	-33.36	QP

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7.2 Conducted Peak Output Power

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

Limit:

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

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	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

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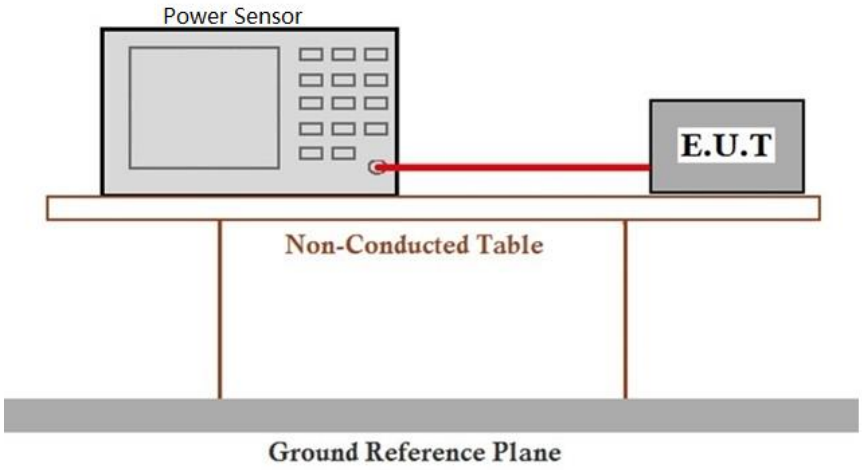
7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.3 Minimum 6dB Bandwidth

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

Limit:
≥500 kHz

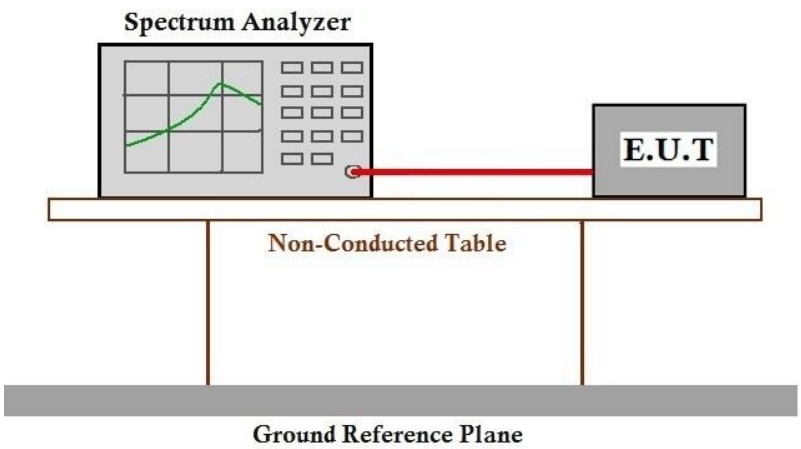
7.3.1 E.U.T. Operation

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	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	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 Power Spectrum Density

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

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

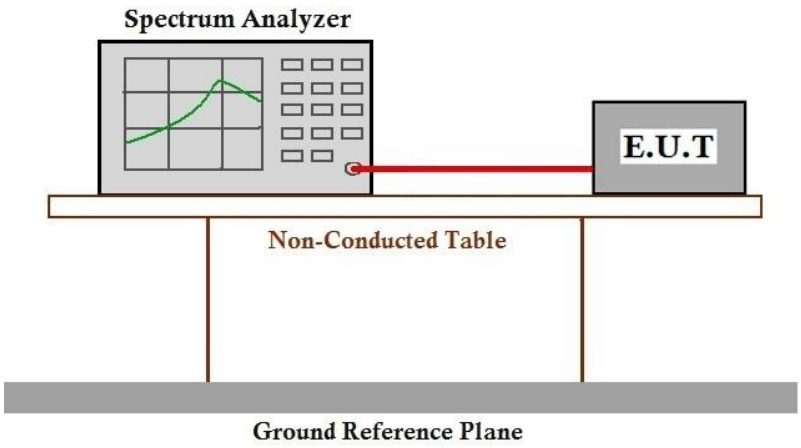
7.4.1 E.U.T. Operation

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	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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7.5 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).

7.5.1 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	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

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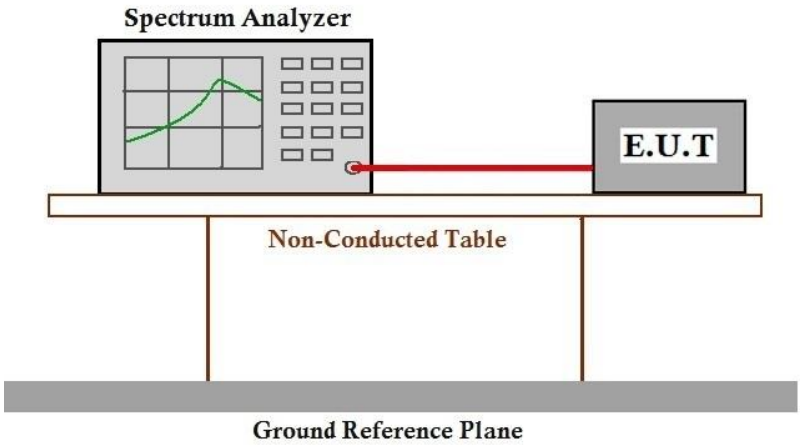
7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

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7.6 Conducted Spurious Emissions

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

Limit:

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

7.6.1 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	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

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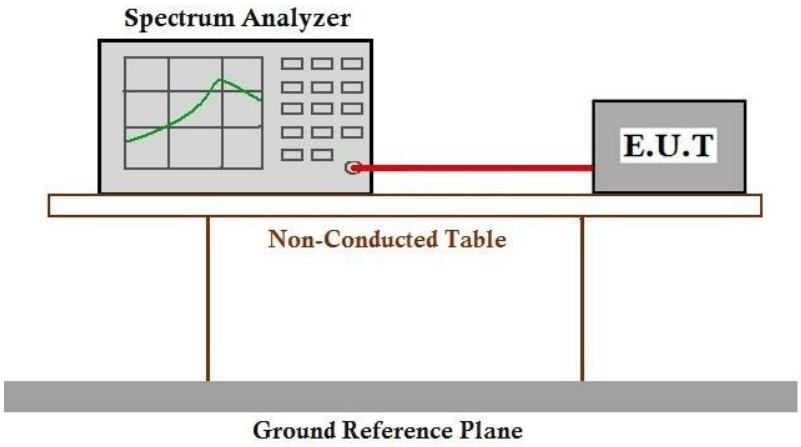
7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

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7.7 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.		

7.7.1 E.U.T. Operation

Operating Environment:
Temperature: 23.6 °C Humidity: 52.6 % RH Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	05	Charge + TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	06	Charge + TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

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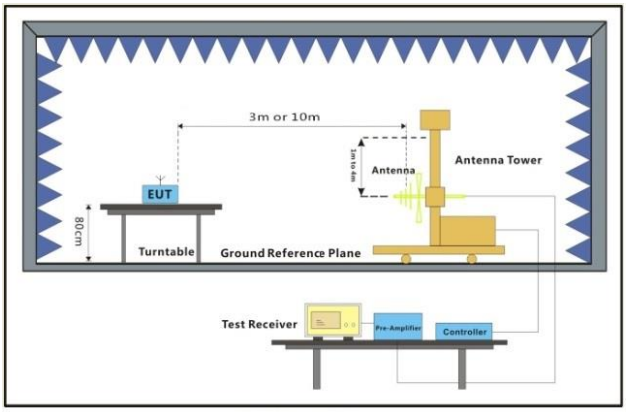
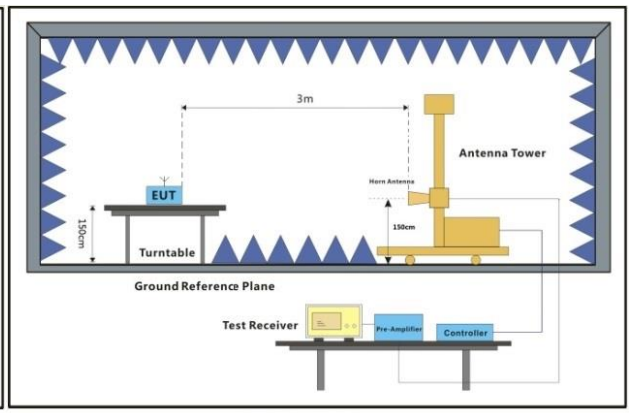
7.7.3 Test Setup Diagram



30MHz-1GHz



Above 1GHz

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. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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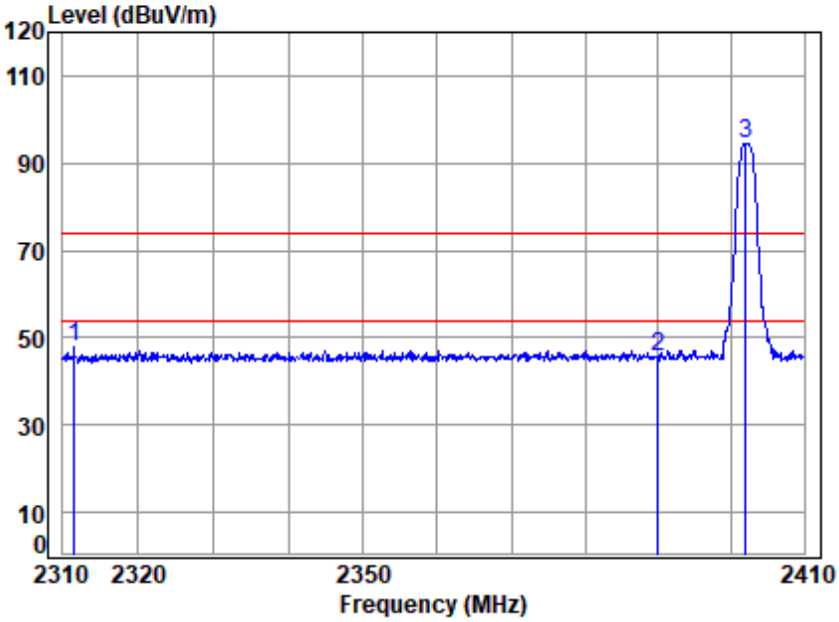
1M

Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2402 Band edge
Note : BLE

	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	2311.47	5.00	26.98	32.50	48.45	47.93	74.00	-26.07	peak
2	2390.00	5.05	27.16	32.50	45.96	45.67	74.00	-28.33	peak
3 p	2402.00	5.06	27.18	32.50	94.89	94.63	74.00	20.63	peak

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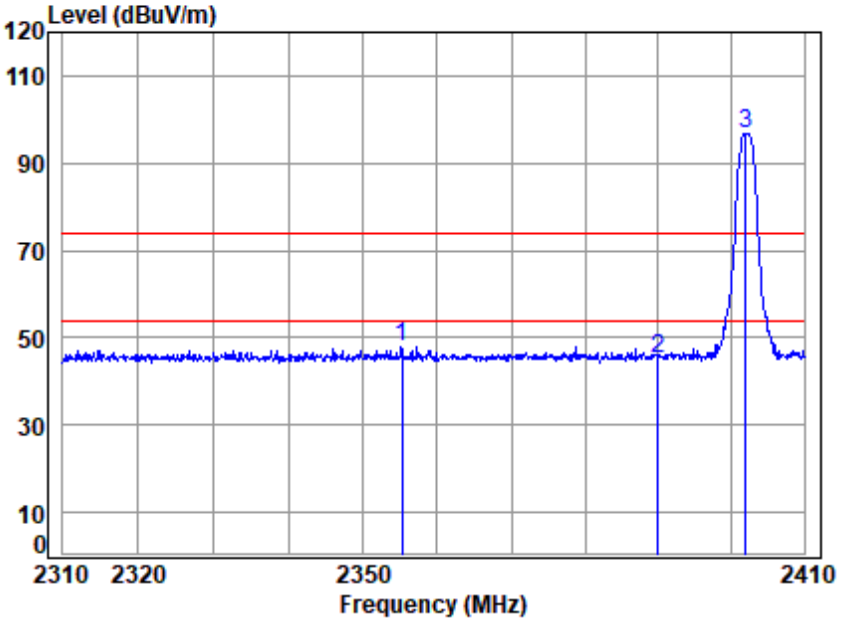
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2402 Band edge
Note : BLE

	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	2355.18	5.03	27.08	32.50	48.46	48.07	74.00	-25.93	peak
2	2390.00	5.05	27.16	32.50	45.56	45.27	74.00	-28.73	peak
3 p	2402.00	5.06	27.18	32.50	97.04	96.78	74.00	22.78	peak

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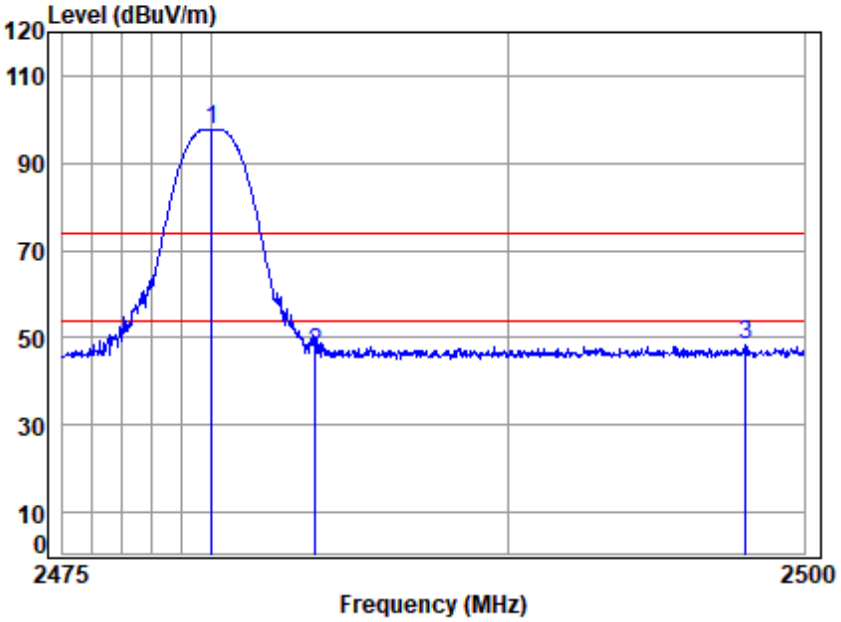
Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2480 Band edge
Note : BLE

	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 p	2480.00	5.12	27.36	32.50	97.82	97.80	74.00	23.80	peak
2	2483.50	5.12	27.36	32.50	46.42	46.40	74.00	-27.60	peak
3	2498.02	5.13	27.40	32.50	48.33	48.36	74.00	-25.64	peak

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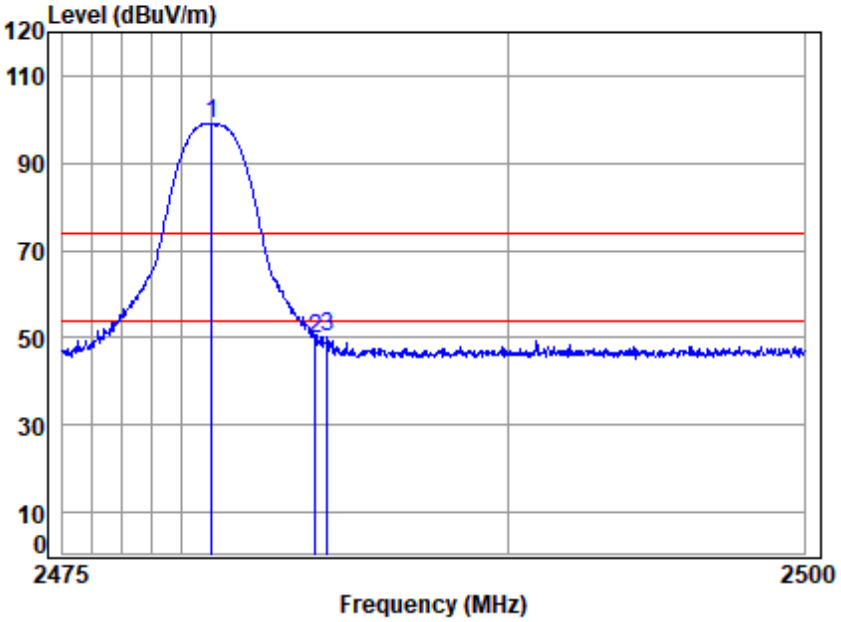
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2480 Band edge
Note : BLE

	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 p	2480.00	5.12	27.36	32.50	98.94	98.92	74.00	24.92	peak
2	2483.50	5.12	27.36	32.50	49.91	49.89	74.00	-24.11	peak
3	2483.90	5.12	27.37	32.50	50.22	50.21	74.00	-23.79	peak

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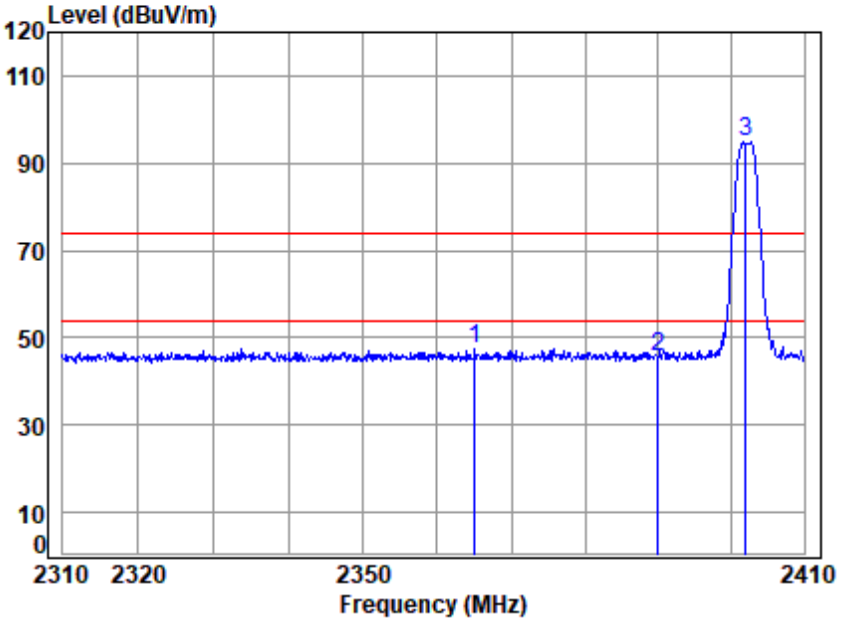
2M

Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2402 Band edge
Note : BLE-2M

	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	2365.08	5.04	27.10	32.50	47.98	47.62	74.00	-26.38	peak
2	2390.00	5.05	27.16	32.50	46.08	45.79	74.00	-28.21	peak
3 p	2402.00	5.06	27.18	32.50	95.04	94.78	74.00	20.78	peak

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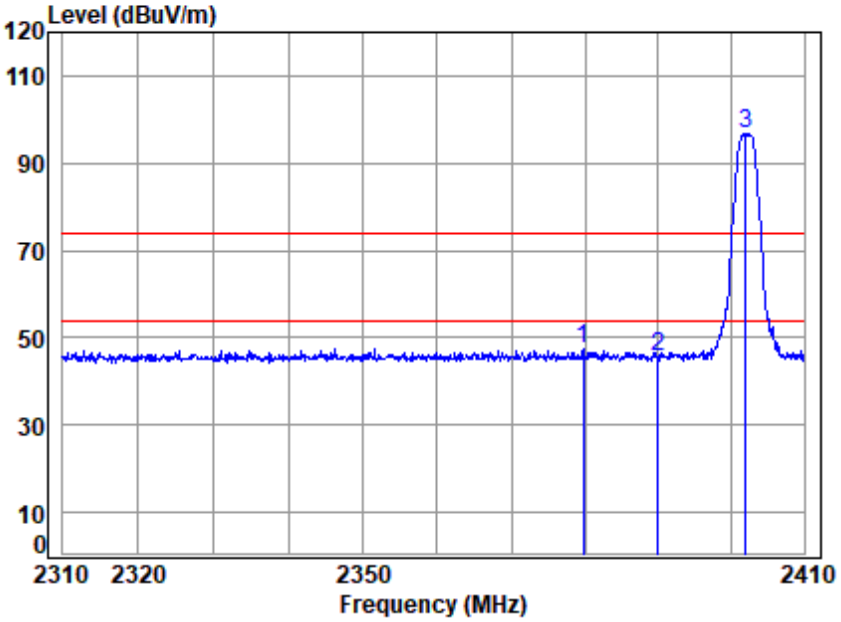
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2402 Band edge
Note : BLE-2M

	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	2379.76	5.05	27.13	32.50	47.73	47.41	74.00	-26.59	peak
2	2390.00	5.05	27.16	32.50	45.78	45.49	74.00	-28.51	peak
3 p	2402.00	5.06	27.18	32.50	97.00	96.74	74.00	22.74	peak

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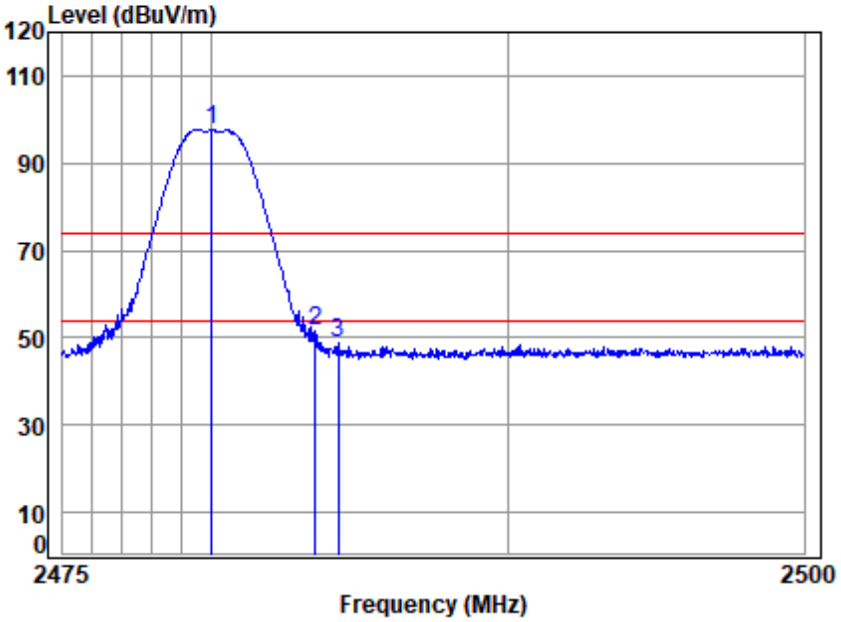
Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2480 Band edge
Note : BLE-2M

	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 p	2480.00	5.12	27.36	32.50	97.85	97.83	74.00	23.83	peak
2	2483.50	5.12	27.36	32.50	51.78	51.76	74.00	-22.24	peak
3	2484.27	5.12	27.37	32.50	48.92	48.91	74.00	-25.09	peak

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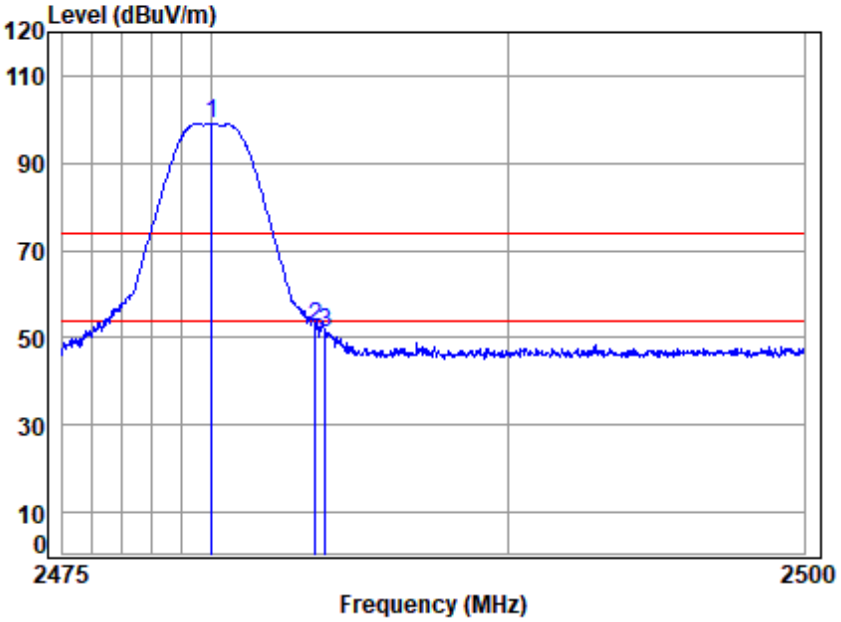
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2480 Band edge
Note : BLE-2M

	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 p	2480.00	5.12	27.36	32.50	99.14	99.12	74.00	25.12	peak
2	2483.50	5.12	27.36	32.50	52.38	52.36	74.00	-21.64	peak
3	2483.82	5.12	27.37	32.50	51.31	51.30	74.00	-22.70	peak

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7.8 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

7.8.1 E.U.T. Operation

Operating Environment:
Temperature: 23.6 °C Humidity: 52.8 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	05	Charge + TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	06	Charge + TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

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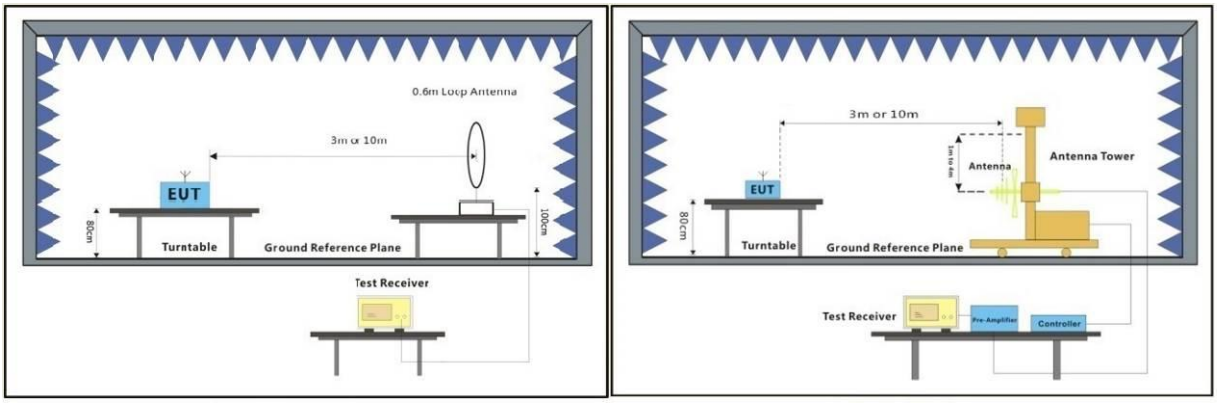
7.8.3 Test Setup Diagram



Below 30MHz 30MHz-1GHz

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 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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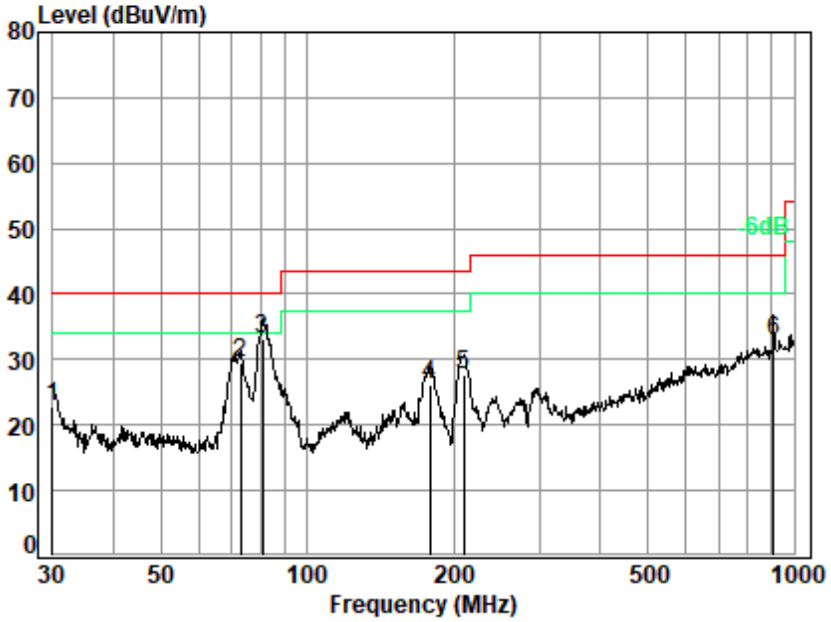
Test Mode: 05; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT
Mode : 05

	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	30.00	0.18	16.39	25.00	31.16	22.73	40.00	-17.27	QP
2	72.85	0.34	15.17	24.82	38.68	29.37	40.00	-10.63	QP
3 p	80.93	0.46	14.36	24.84	43.18	33.16	40.00	-6.84	QP
4	178.76	0.67	16.25	25.55	34.66	26.03	43.50	-17.47	QP
5	210.05	0.73	15.53	25.57	36.94	27.63	43.50	-15.87	QP
6	906.48	2.25	28.71	25.53	27.48	32.91	46.00	-13.09	QP

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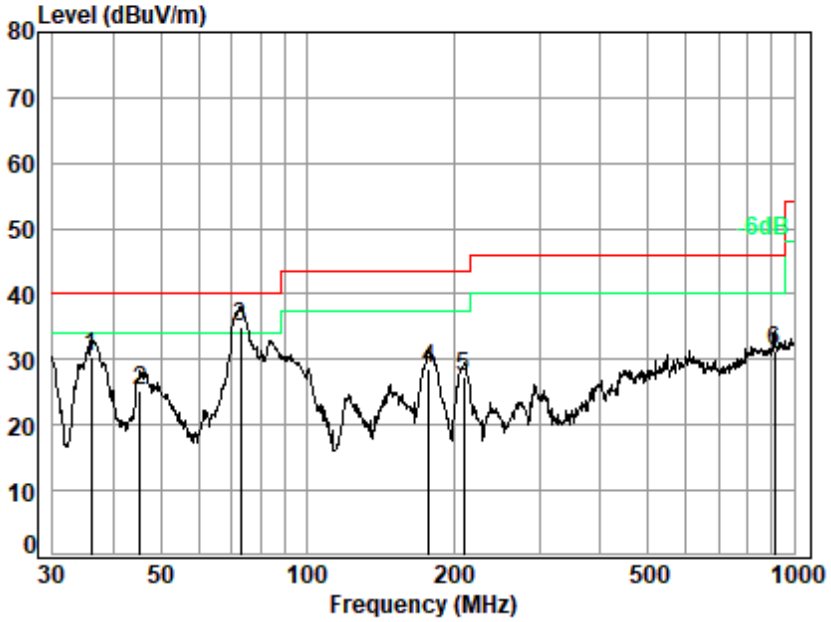
Test Mode: 05; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT
Mode : 05

	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	36.00	0.19	15.88	24.96	39.19	30.30	40.00	-9.70	QP
2	45.38	0.21	17.28	24.92	32.67	25.24	40.00	-14.76	QP
3 p	72.85	0.34	15.17	24.82	44.44	35.13	40.00	-4.87	QP
4	177.51	0.68	16.34	25.55	37.21	28.68	43.50	-14.82	QP
5	209.31	0.72	15.50	25.57	36.71	27.36	43.50	-16.14	QP
6	909.67	2.24	28.88	25.53	25.74	31.33	46.00	-14.67	QP

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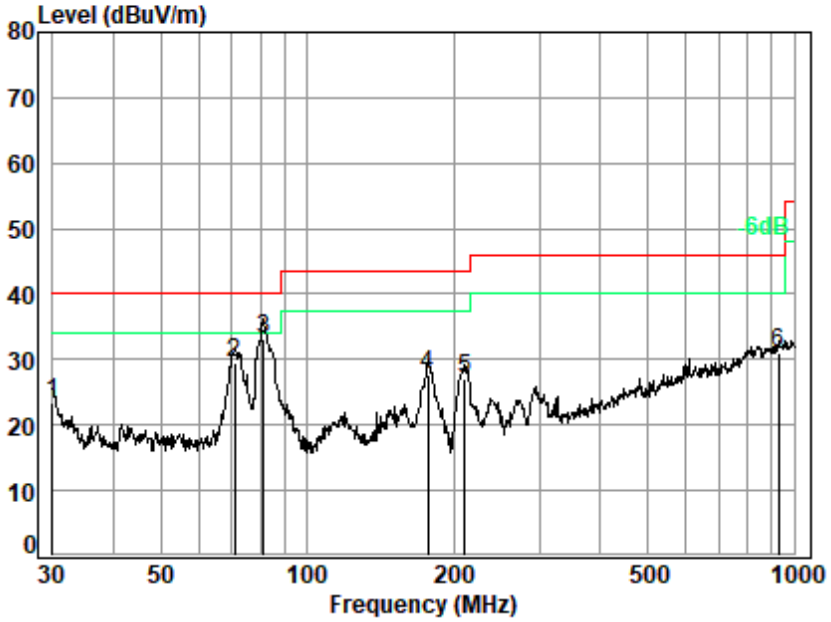
Test Mode: 06; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT
Mode : 06

	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	30.00	0.18	16.39	25.00	31.91	23.48	40.00	-16.52	
2	71.08	0.31	15.63	24.83	38.49	29.60	40.00	-10.40	QP
3 p	81.21	0.47	14.33	24.85	43.17	33.12	40.00	-6.88	QP
4	176.89	0.68	16.38	25.55	36.31	27.82	43.50	-15.68	QP
5	210.79	0.73	15.55	25.57	36.43	27.14	43.50	-16.36	QP
6	929.01	2.16	29.06	25.50	25.20	30.92	46.00	-15.08	QP

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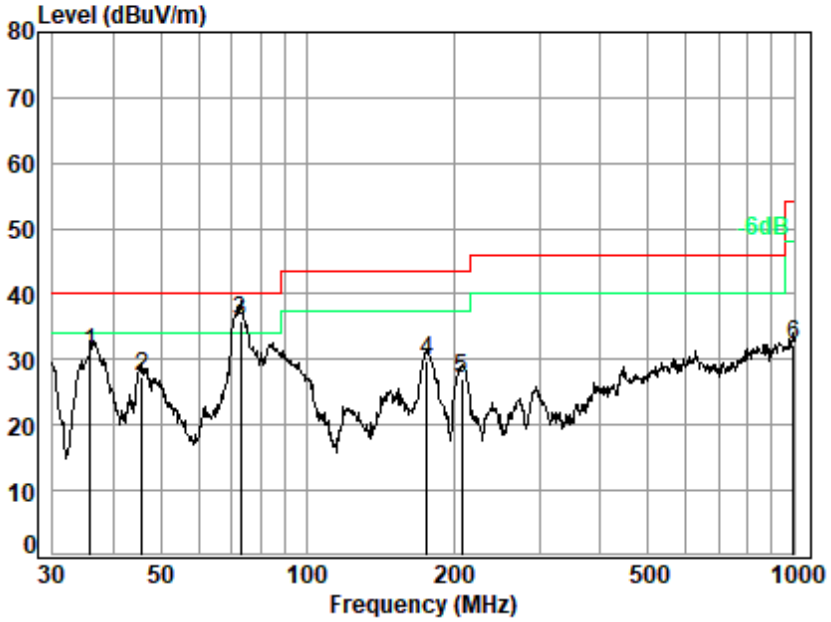
Test Mode: 06; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT
Mode : 06

	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	35.87	0.19	15.85	24.96	39.87	30.95	40.00	-9.05	QP
2	45.69	0.21	17.27	24.92	34.88	27.44	40.00	-12.56	QP
3 p	72.85	0.34	15.17	24.82	45.11	35.80	40.00	-4.20	QP
4	176.27	0.68	16.43	25.55	38.13	29.69	43.50	-13.81	QP
5	207.85	0.72	15.44	25.57	36.52	27.11	43.50	-16.39	QP
6	996.50	2.60	29.30	25.40	25.72	32.22	54.00	-21.78	QP

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7.9 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

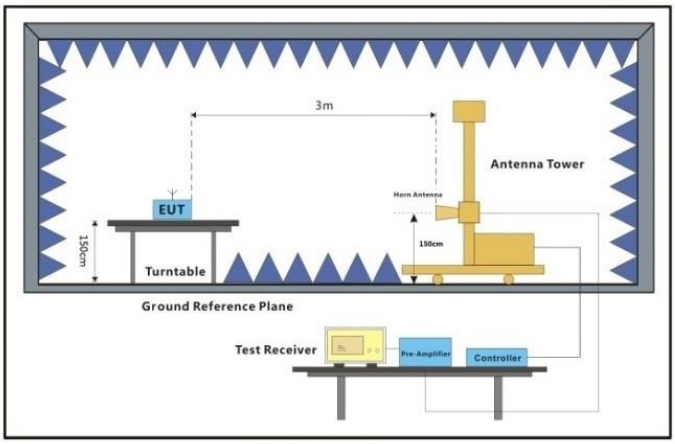
7.9.1 E.U.T. Operation

Operating Environment:
Temperature: 23.6 °C Humidity: 52.3 % RH Atmospheric Pressure: 1020 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	05	Charge + TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	06	Charge + TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.9.3 Test Setup Diagram



Above 1GHz

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7.9.4 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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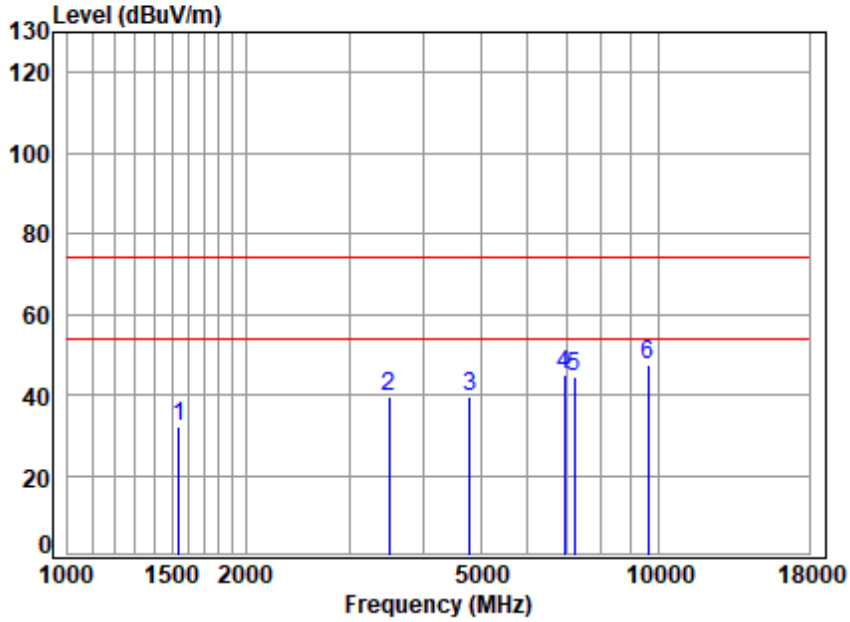
1M

Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2402 TX RSE
Note : BLE

	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	1542.73	3.87	24.64	52.88	56.69	32.32	74.00	-41.68	peak
2	3505.81	7.00	28.71	52.94	56.56	39.33	74.00	-34.67	peak
3	4804.00	7.98	30.94	53.05	53.60	39.47	74.00	-34.53	peak
4	6934.78	8.13	35.65	53.46	54.75	45.07	74.00	-28.93	peak
5	7206.00	8.29	36.05	53.52	53.61	44.43	74.00	-29.57	peak
6 p	9608.00	11.41	37.53	53.58	52.10	47.46	74.00	-26.54	peak

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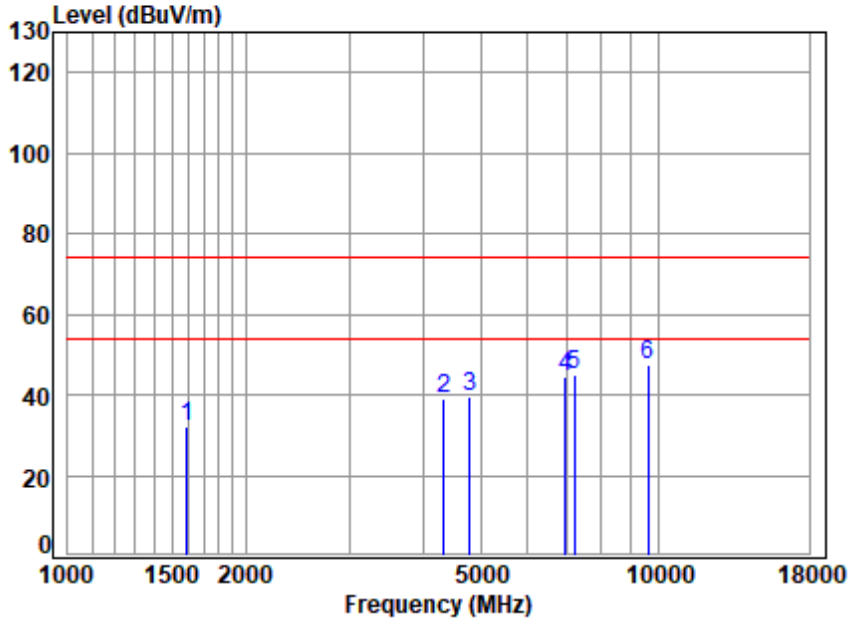
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2402 TX RSE
Note : BLE

	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	1592.57	3.97	24.78	52.90	56.17	32.02	74.00	-41.98	peak
2	4341.89	7.48	29.99	52.91	54.68	39.24	74.00	-34.76	peak
3	4804.00	7.98	30.94	53.05	53.60	39.47	74.00	-34.53	peak
4	6954.85	8.15	35.70	53.47	54.24	44.62	74.00	-29.38	peak
5	7206.00	8.29	36.05	53.52	54.30	45.12	74.00	-28.88	peak
6 p	9608.00	11.41	37.53	53.58	51.89	47.25	74.00	-26.75	peak

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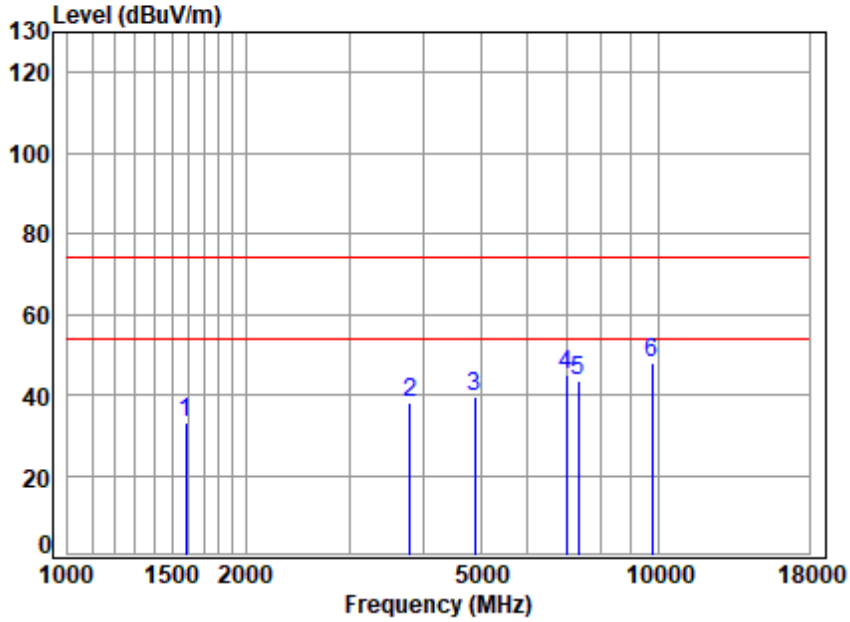
Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2440 TX RSE
Note : BLE

	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	1583.39	3.95	24.75	52.90	57.37	33.17	74.00	-40.83	peak
2	3801.33	7.30	29.19	52.85	54.50	38.14	74.00	-35.86	peak
3	4880.00	8.11	31.12	53.07	53.51	39.67	74.00	-34.33	peak
4	6974.98	8.17	35.74	53.48	54.52	44.95	74.00	-29.05	peak
5	7320.00	8.35	36.19	53.53	52.34	43.35	74.00	-30.65	peak
6 p	9760.00	11.30	37.87	53.43	52.29	48.03	74.00	-25.97	peak

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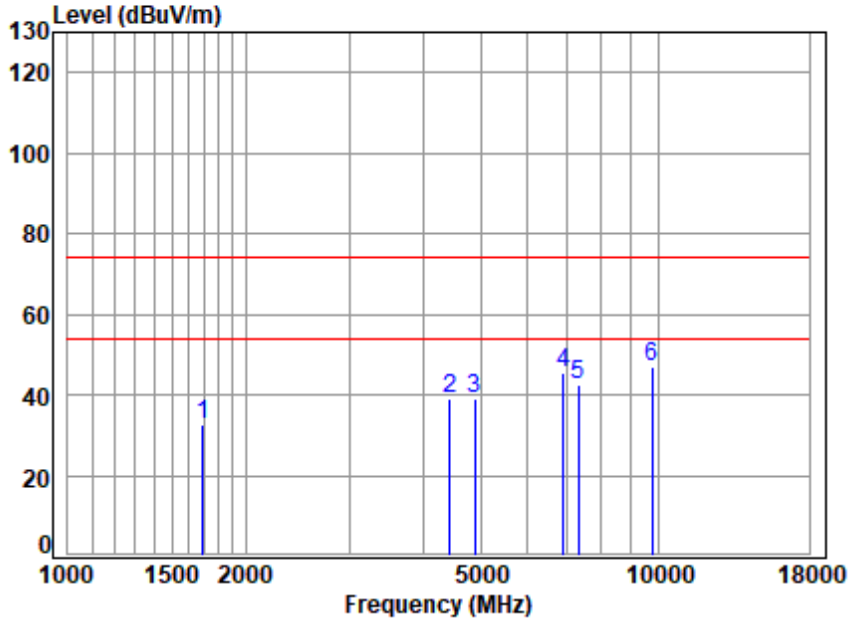
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2440 TX RSE
Note : BLE

	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	1692.23	4.18	24.99	52.96	56.19	32.40	74.00	-41.60	peak
2	4430.63	7.47	30.11	52.94	54.26	38.90	74.00	-35.10	peak
3	4880.00	8.11	31.12	53.07	52.72	38.88	74.00	-35.12	peak
4	6914.76	8.11	35.60	53.44	55.20	45.47	74.00	-28.53	peak
5	7320.00	8.35	36.19	53.53	51.52	42.53	74.00	-31.47	peak
6 p	9760.00	11.30	37.87	53.43	51.37	47.11	74.00	-26.89	peak

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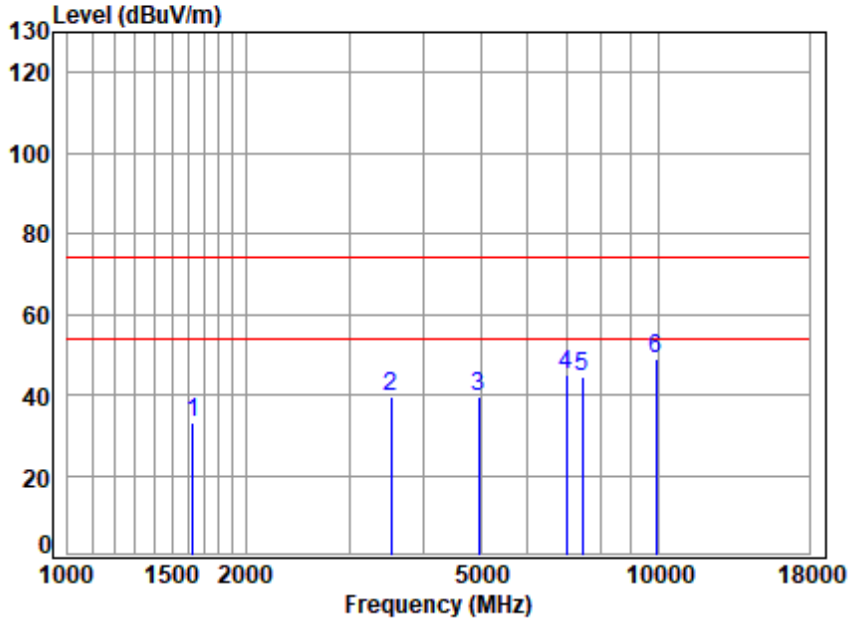
Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2480 TX RSE
Note : BLE

	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	1629.83	4.05	24.86	52.92	57.21	33.20	74.00	-40.80	peak
2	3526.13	7.02	28.74	52.93	56.77	39.60	74.00	-34.40	peak
3	4960.00	8.24	31.31	53.09	53.01	39.47	74.00	-34.53	peak
4	6974.98	8.17	35.74	53.48	54.73	45.16	74.00	-28.84	peak
5	7440.00	8.40	36.33	53.55	53.49	44.67	74.00	-29.33	peak
6 p	9920.00	11.18	38.22	53.28	52.66	48.78	74.00	-25.22	peak

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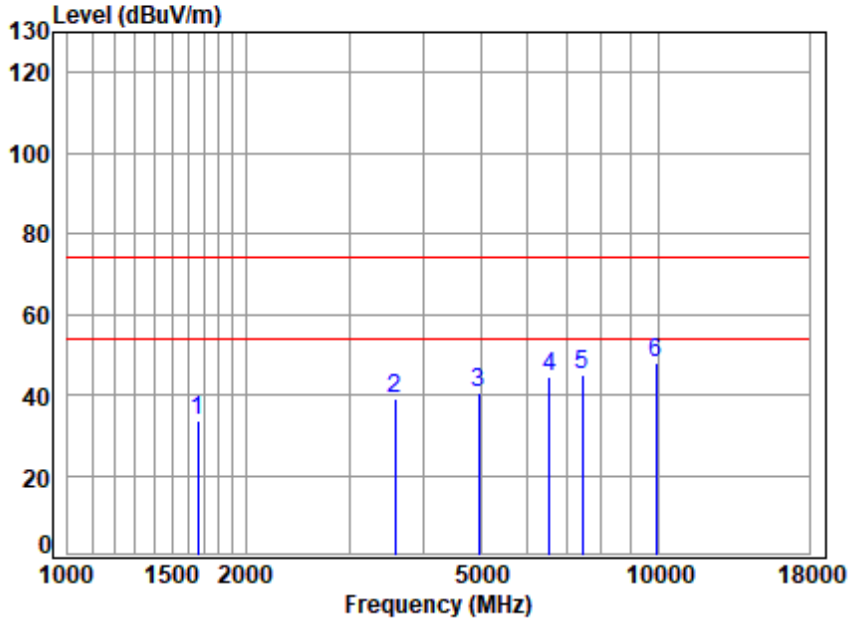
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2480 TX RSE
Note : BLE

	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	1658.34	4.11	24.92	52.94	57.41	33.50	74.00	-40.50	peak
2	3587.82	7.08	28.85	52.91	56.08	39.10	74.00	-34.90	peak
3	4960.00	8.24	31.31	53.09	54.15	40.61	74.00	-33.39	peak
4	6545.26	7.75	34.71	53.19	55.06	44.33	74.00	-29.67	peak
5	7440.00	8.40	36.33	53.55	53.87	45.05	74.00	-28.95	peak
6 p	9920.00	11.18	38.22	53.28	51.64	47.76	74.00	-26.24	peak

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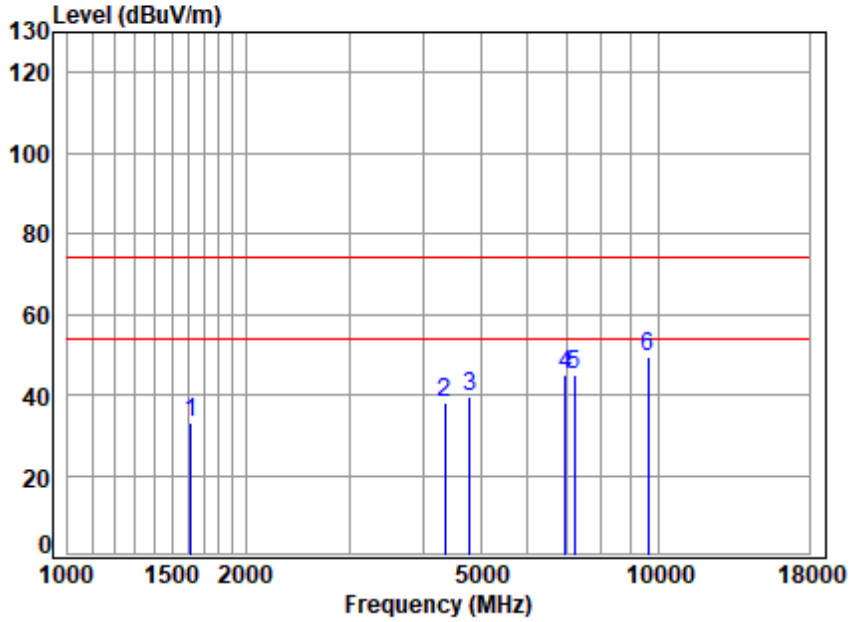
2M

Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2402 TX RSE
Note : BLE-2M

	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	1615.75	4.02	24.83	52.92	57.21	33.14	74.00	-40.86	peak
2	4354.45	7.48	30.00	52.91	53.52	38.09	74.00	-35.91	peak
3	4804.00	7.98	30.94	53.05	53.51	39.38	74.00	-34.62	peak
4	6954.85	8.15	35.70	53.47	54.39	44.77	74.00	-29.23	peak
5	7206.00	8.29	36.05	53.52	54.30	45.12	74.00	-28.88	peak
6 p	9608.00	11.41	37.53	53.58	53.86	49.22	74.00	-24.78	peak

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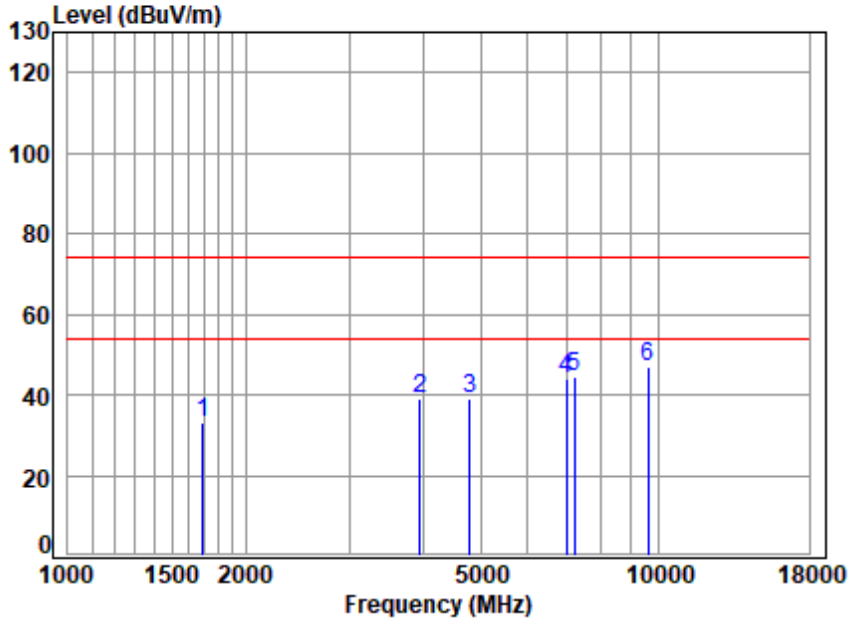
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2402 TX RSE
Note : BLE-2M

	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	1692.23	4.18	24.99	52.96	56.77	32.98	74.00	-41.02	peak
2	3946.89	7.44	29.42	52.81	55.02	39.07	74.00	-34.93	peak
3	4804.00	7.98	30.94	53.05	53.21	39.08	74.00	-34.92	peak
4	6995.17	8.19	35.79	53.50	53.61	44.09	74.00	-29.91	peak
5	7206.00	8.29	36.05	53.52	53.85	44.67	74.00	-29.33	peak
6 p	9608.00	11.41	37.53	53.58	51.77	47.13	74.00	-26.87	peak

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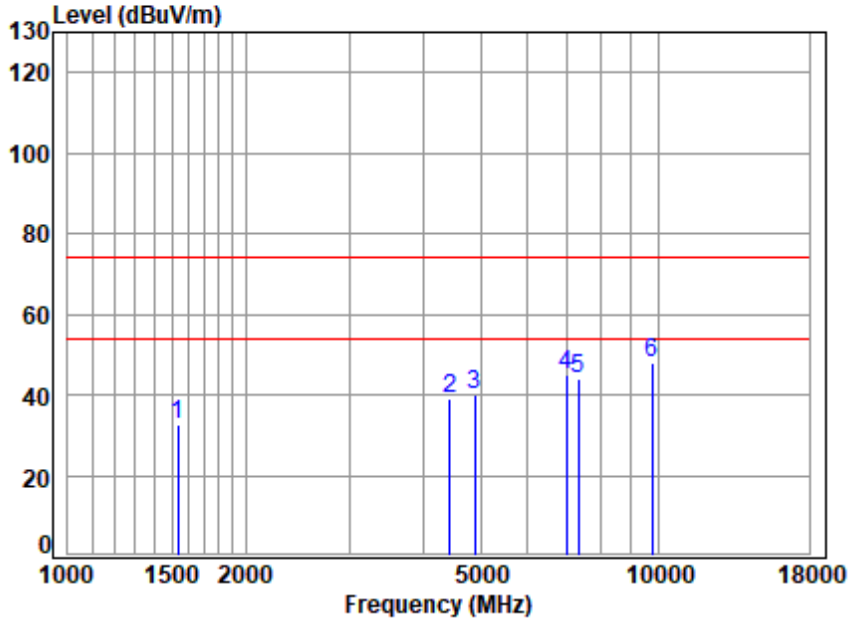
Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2440 TX RSE
Note : BLE-2M

	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	1533.84	3.85	24.61	52.87	57.26	32.85	74.00	-41.15	peak
2	4443.45	7.47	30.12	52.94	54.42	39.07	74.00	-34.93	peak
3	4880.00	8.11	31.12	53.07	53.78	39.94	74.00	-34.06	peak
4	6974.98	8.17	35.74	53.48	54.64	45.07	74.00	-28.93	peak
5	7320.00	8.35	36.19	53.53	53.20	44.21	74.00	-29.79	peak
6 p	9760.00	11.30	37.87	53.43	52.42	48.16	74.00	-25.84	peak

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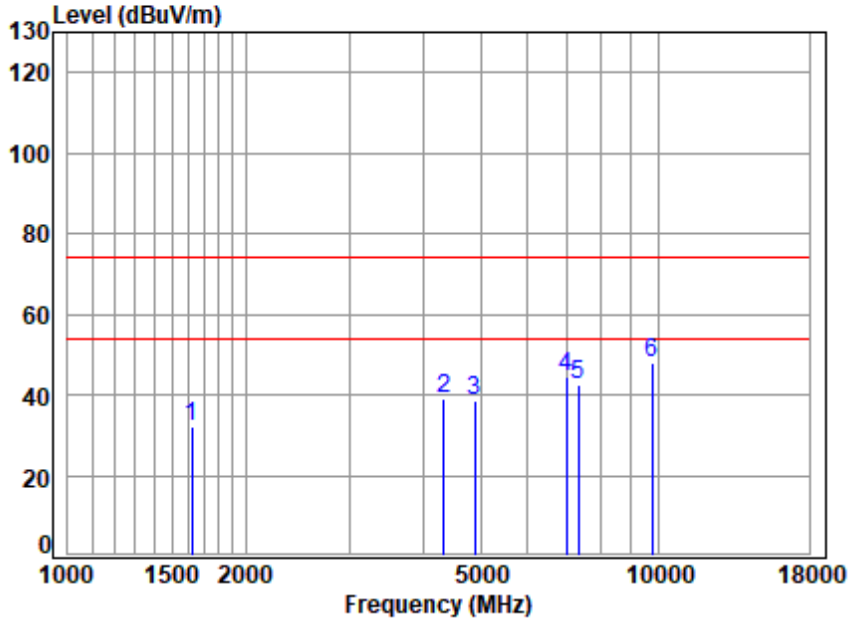
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2440 TX RSE
Note : BLE-2M

	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	1620.43	4.03	24.84	52.92	56.25	32.20	74.00	-41.80	peak
2	4341.89	7.48	29.99	52.91	54.28	38.84	74.00	-35.16	peak
3	4880.00	8.11	31.12	53.07	52.23	38.39	74.00	-35.61	peak
4	6974.98	8.17	35.74	53.48	53.87	44.30	74.00	-29.70	peak
5	7320.00	8.35	36.19	53.53	51.63	42.64	74.00	-31.36	peak
6 p	9760.00	11.30	37.87	53.43	52.13	47.87	74.00	-26.13	peak

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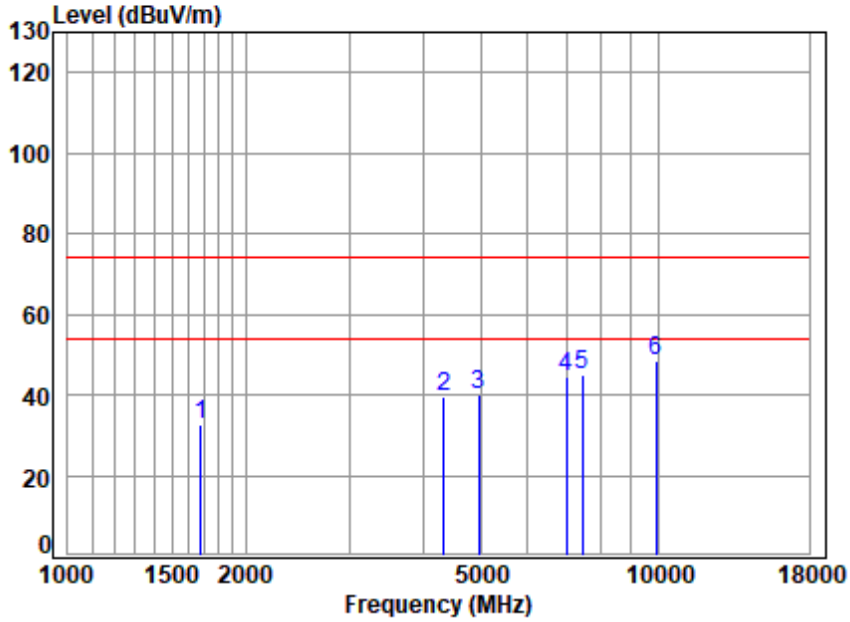
Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00134AT/00135AT
Mode : 2480 TX RSE
Note : BLE-2M

	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	1682.48	4.16	24.97	52.95	56.21	32.39	74.00	-41.61	peak
2	4341.89	7.48	29.99	52.91	54.83	39.39	74.00	-34.61	peak
3	4960.00	8.24	31.31	53.09	53.45	39.91	74.00	-34.09	peak
4	6995.17	8.19	35.79	53.50	53.97	44.45	74.00	-29.55	peak
5	7440.00	8.40	36.33	53.55	53.74	44.92	74.00	-29.08	peak
6 p	9920.00	11.18	38.22	53.28	52.28	48.40	74.00	-25.60	peak

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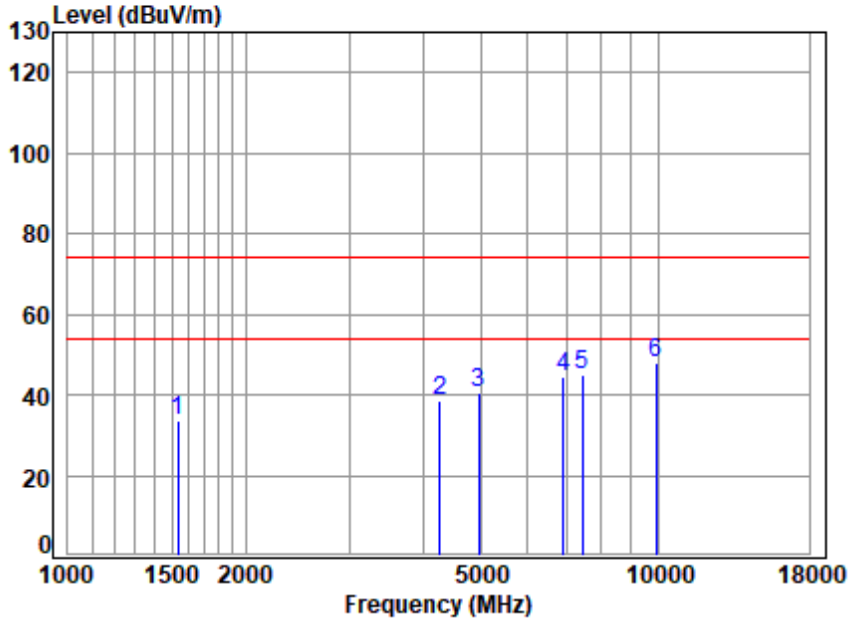
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00134AT/00135AT
Mode : 2480 TX RSE
Note : BLE-2M

	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	1538.28	3.86	24.62	52.87	57.87	33.48	74.00	-40.52	peak
2	4267.24	7.48	29.88	52.89	54.21	38.68	74.00	-35.32	peak
3	4960.00	8.24	31.31	53.09	53.95	40.41	74.00	-33.59	peak
4	6894.81	8.09	35.55	53.43	54.23	44.44	74.00	-29.56	peak
5	7440.00	8.40	36.33	53.55	53.89	45.07	74.00	-28.93	peak
6 p	9920.00	11.18	38.22	53.28	51.97	48.09	74.00	-25.91	peak

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7.10 Duty Cycle

Test Requirement ANSI C63.10 Section 12.2
Test Method: ANSI C63.10 Section 12.2

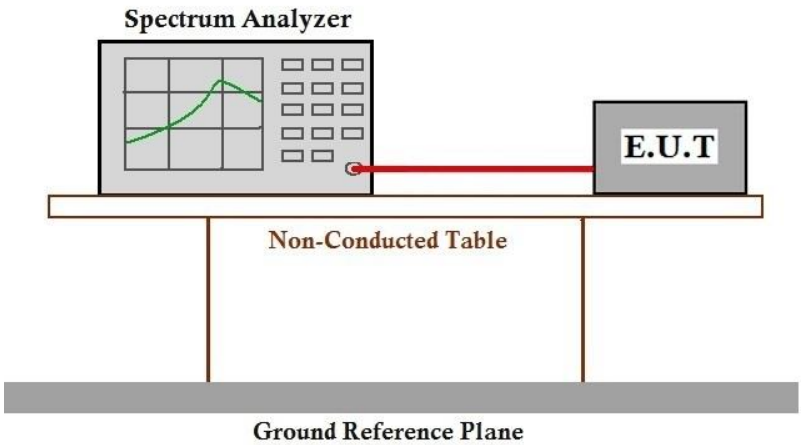
7.10.1 E.U.T. Operation

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

7.10.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	04	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.10.3 Test Setup Diagram



7.10.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for FYCR2204000134AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for FYCR2204000134AT

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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 (%)
1M	SISO	2402	0.393	0.625	62.88	2.01	0.00
		2440	0.414	0.625	66.24	1.79	0.00
		2480	0.393	0.625	62.88	2.01	0.03
2M	SISO	2402	0.208	0.625	33.28	4.78	0.00
		2440	0.229	0.625	36.64	4.36	0.02
		2480	0.229	0.625	36.64	4.36	0.02

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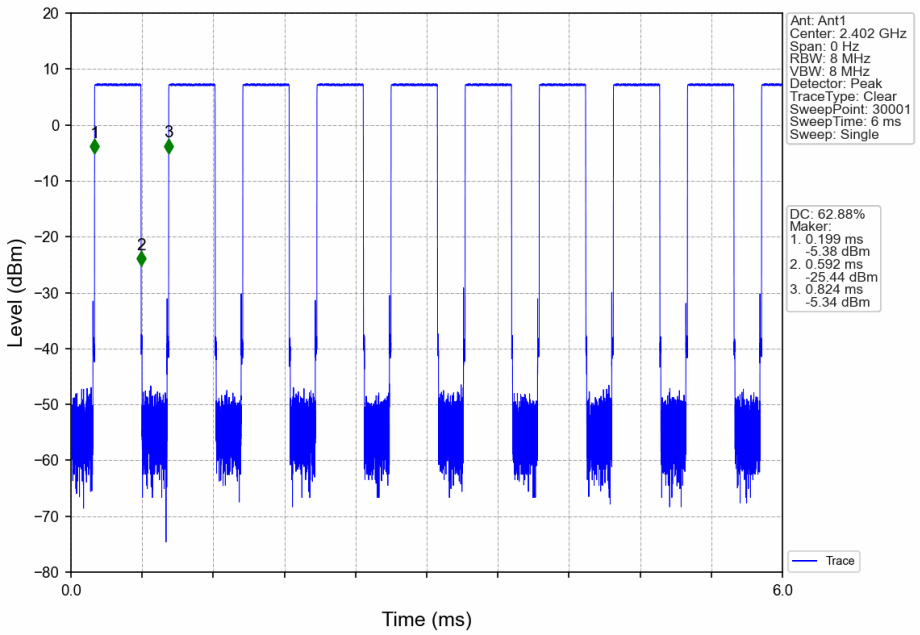
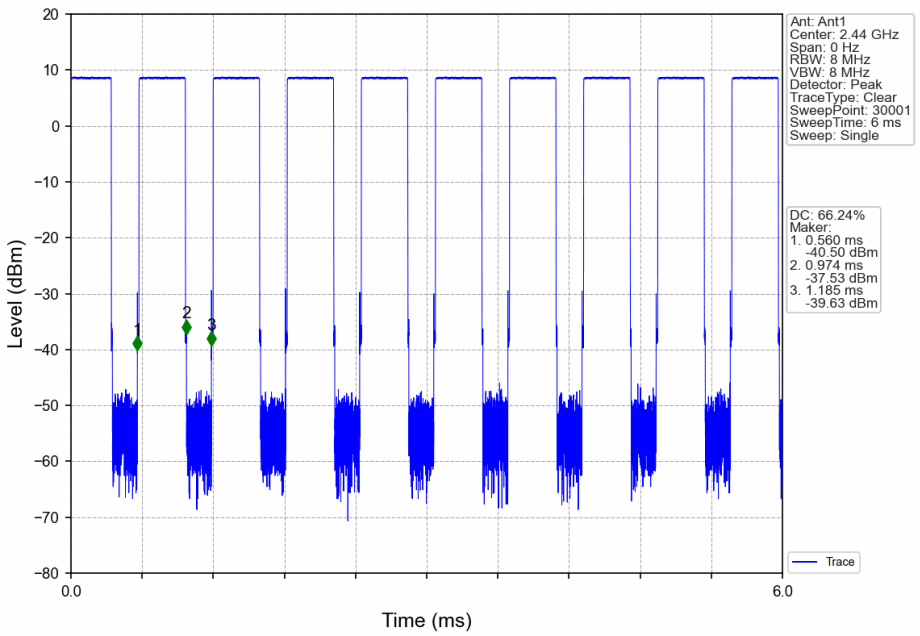
1.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



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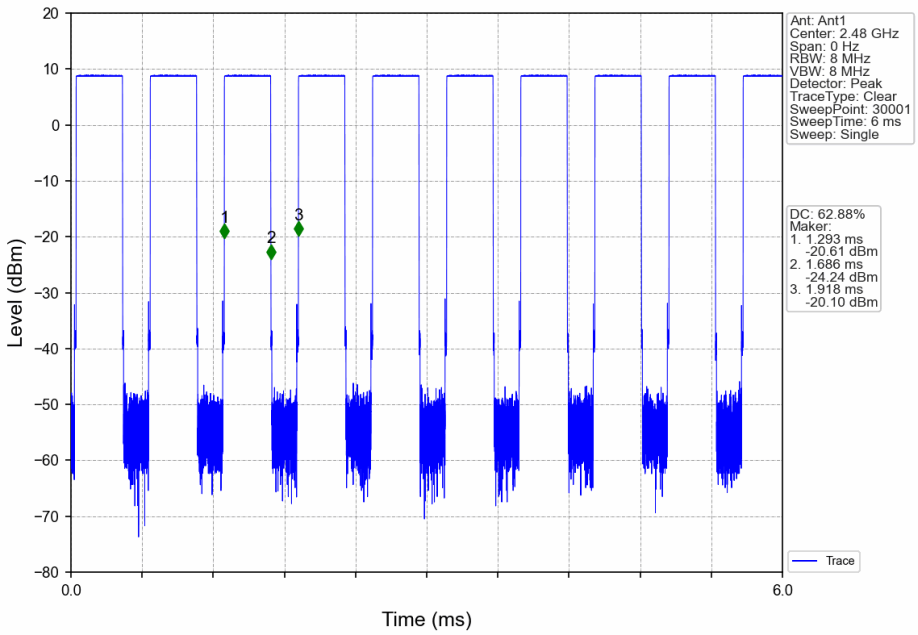
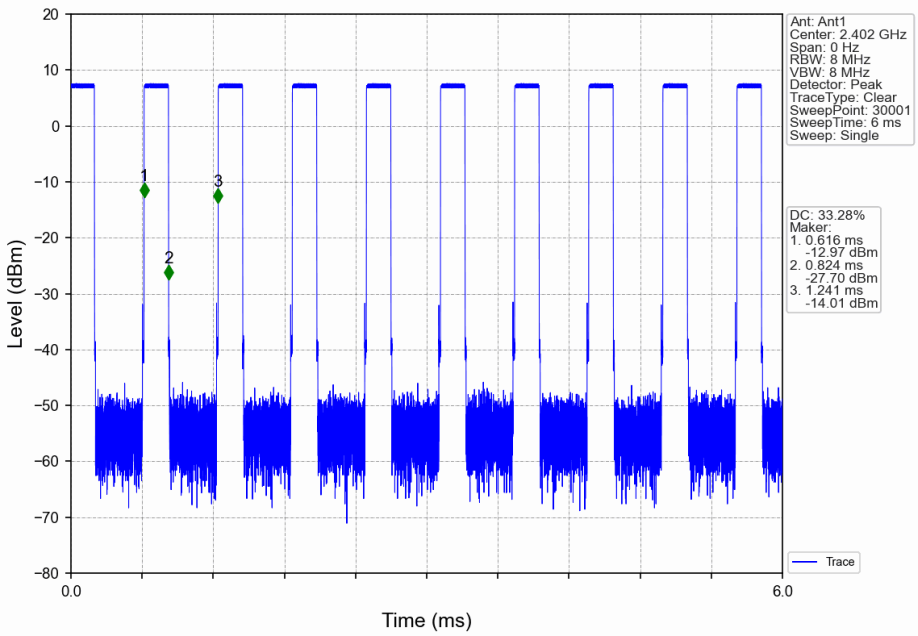
1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



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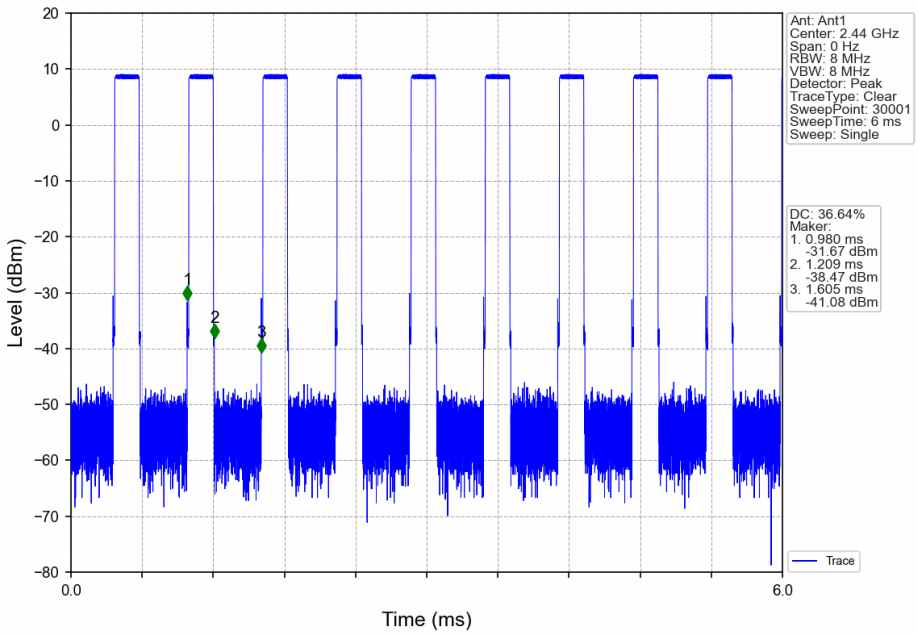
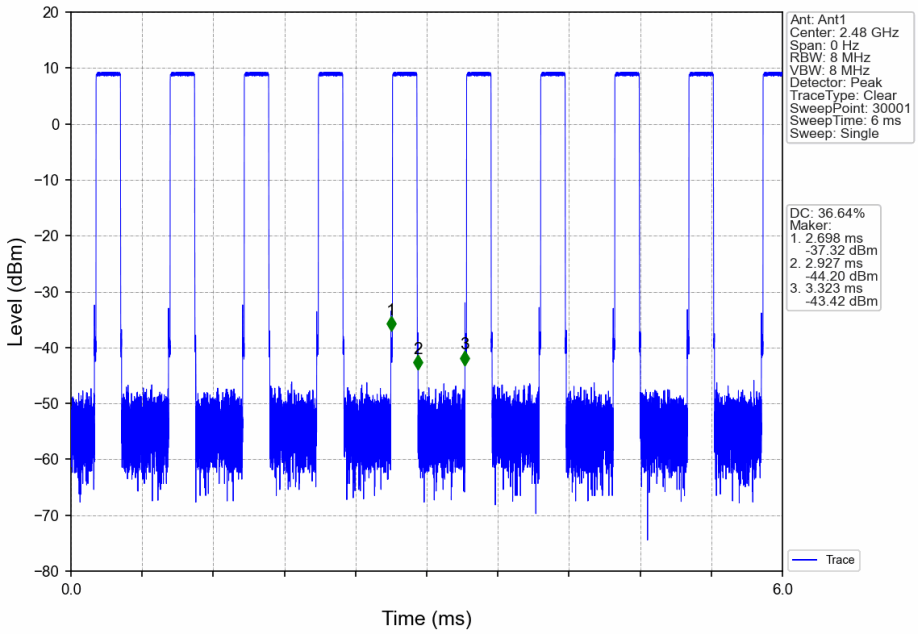
2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



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2. Bandwidth

2.1 6dB BW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.664	>=0.5	Pass
		2440	1	0.671	>=0.5	Pass
		2480	1	0.666	>=0.5	Pass
2M	SISO	2402	1	1.136	>=0.5	Pass
		2440	1	1.143	>=0.5	Pass
		2480	1	1.151	>=0.5	Pass

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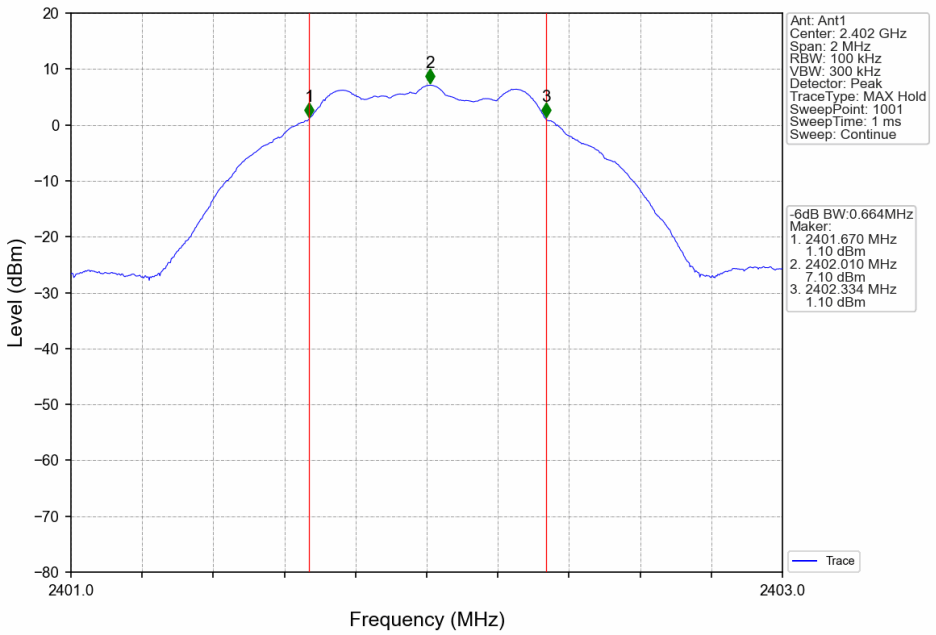
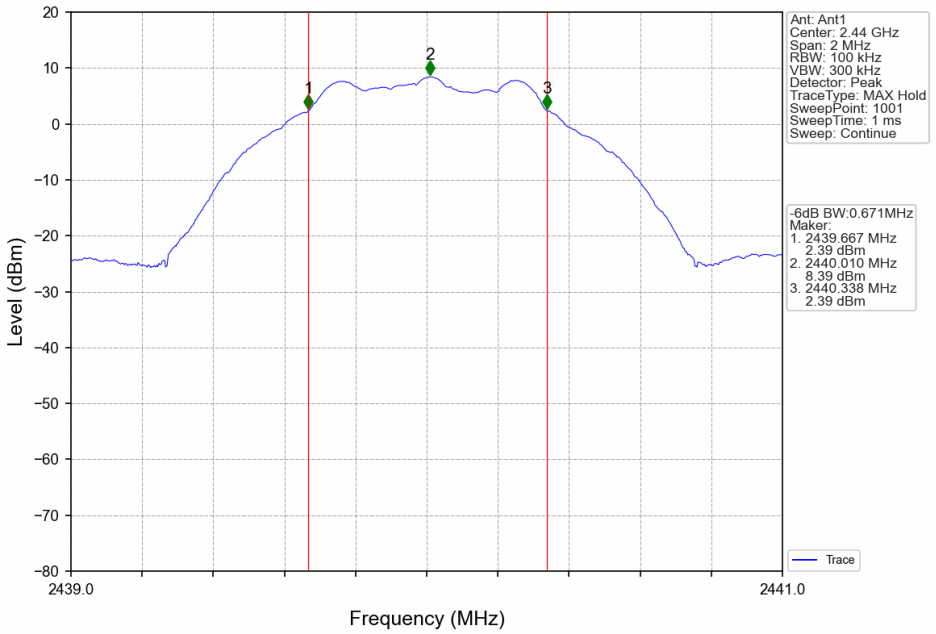
2.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



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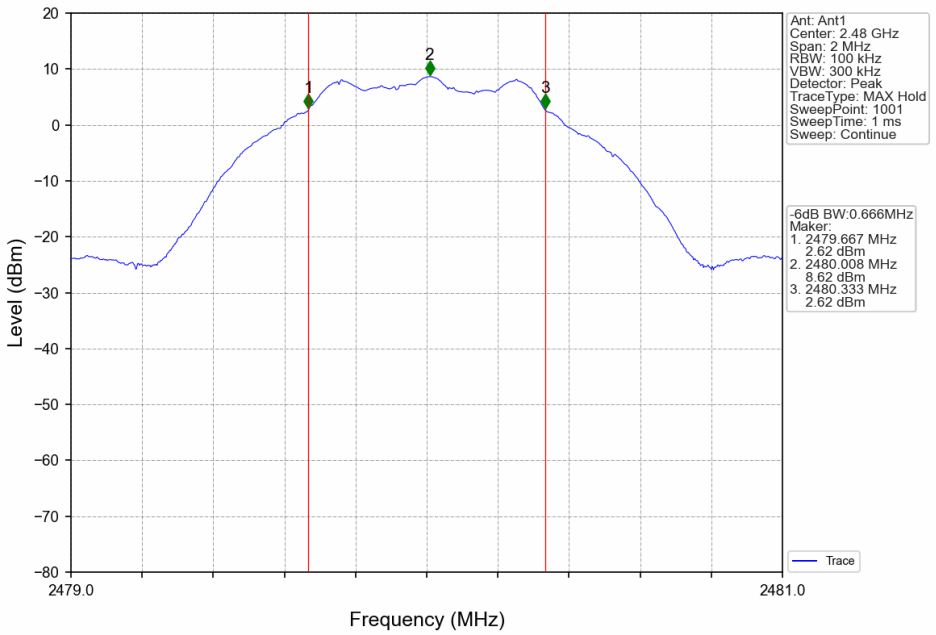
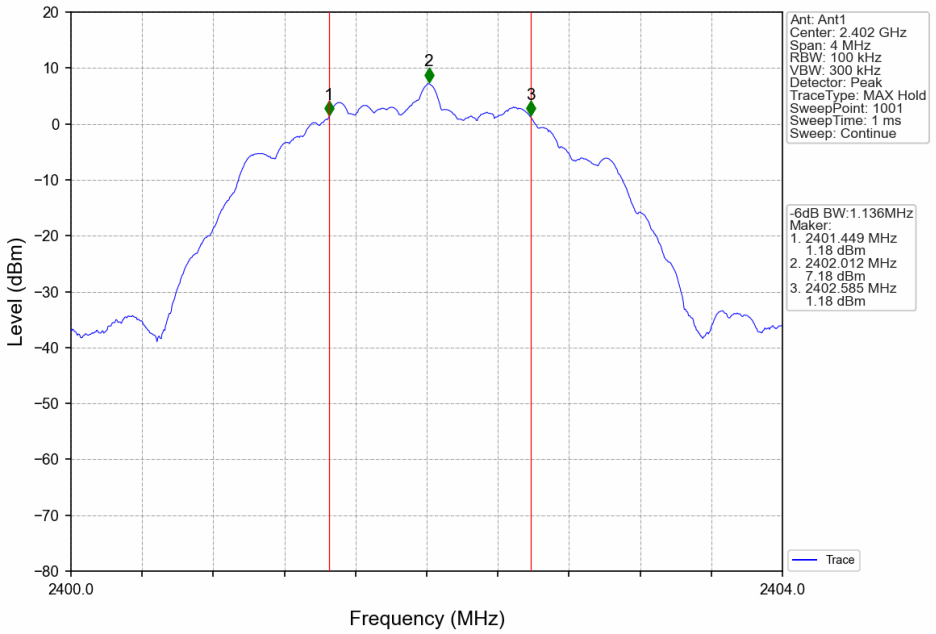
1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



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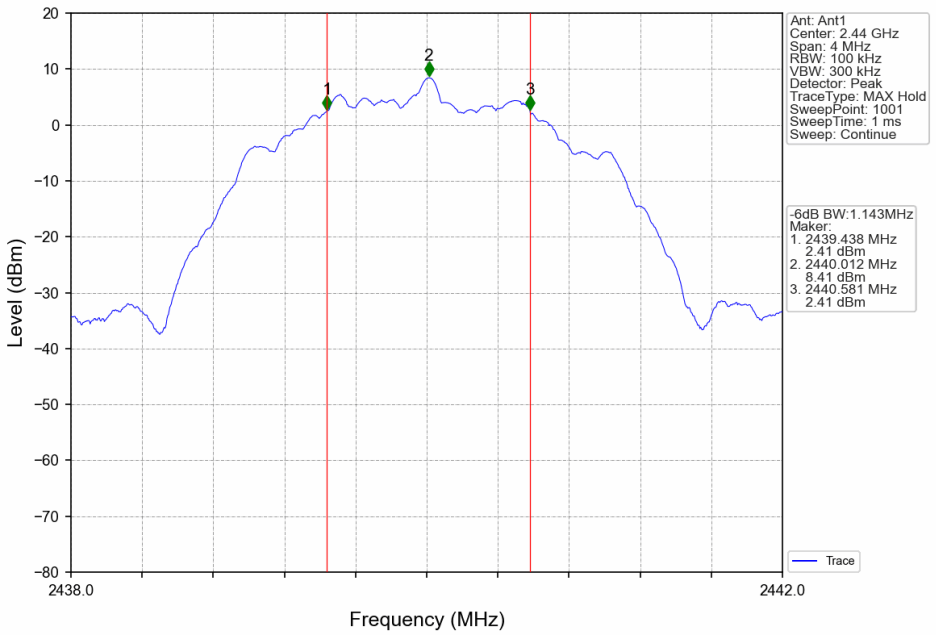
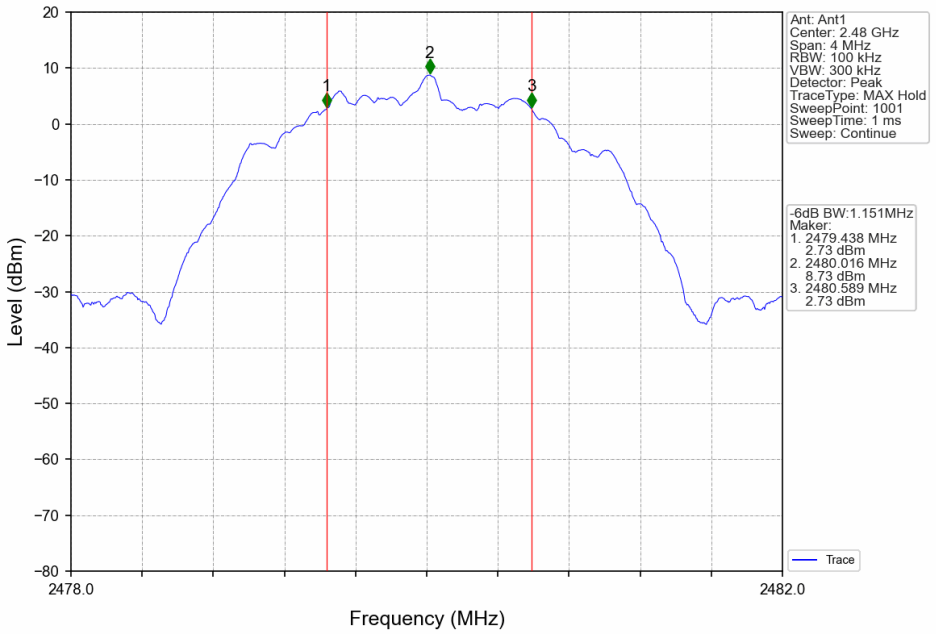
2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



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3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	7.38	<=30	Pass
		2440	8.44	<=30	Pass
		2480	8.69	<=30	Pass
2M	SISO	2402	7.40	<=30	Pass
		2440	8.53	<=30	Pass
		2480	8.87	<=30	Pass

4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-7.41	<=8	Pass
		2440	-6.08	<=8	Pass
		2480	-5.89	<=8	Pass
2M	SISO	2402	-11.05	<=8	Pass
		2440	-9.65	<=8	Pass
		2480	-9.32	<=8	Pass

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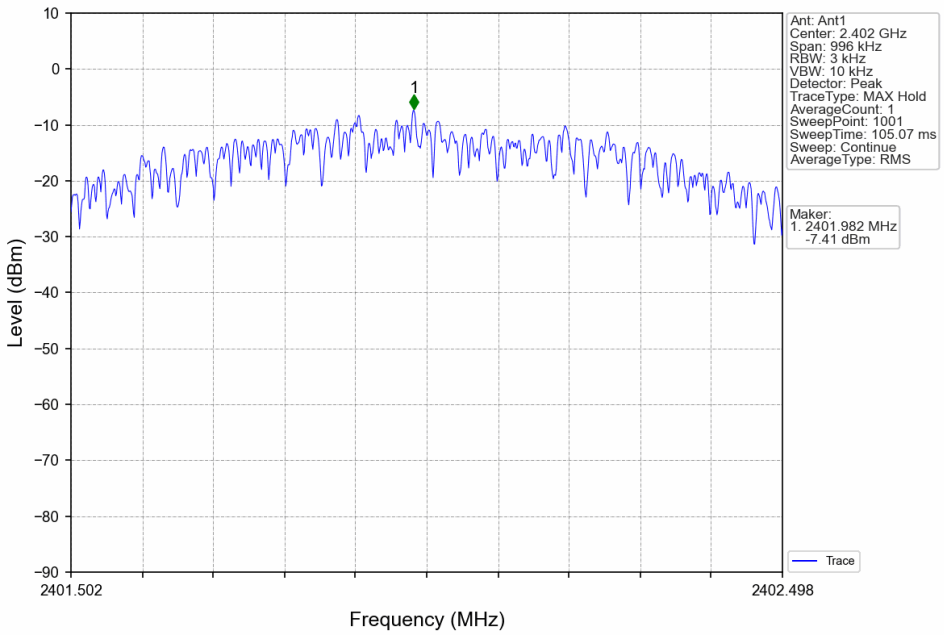
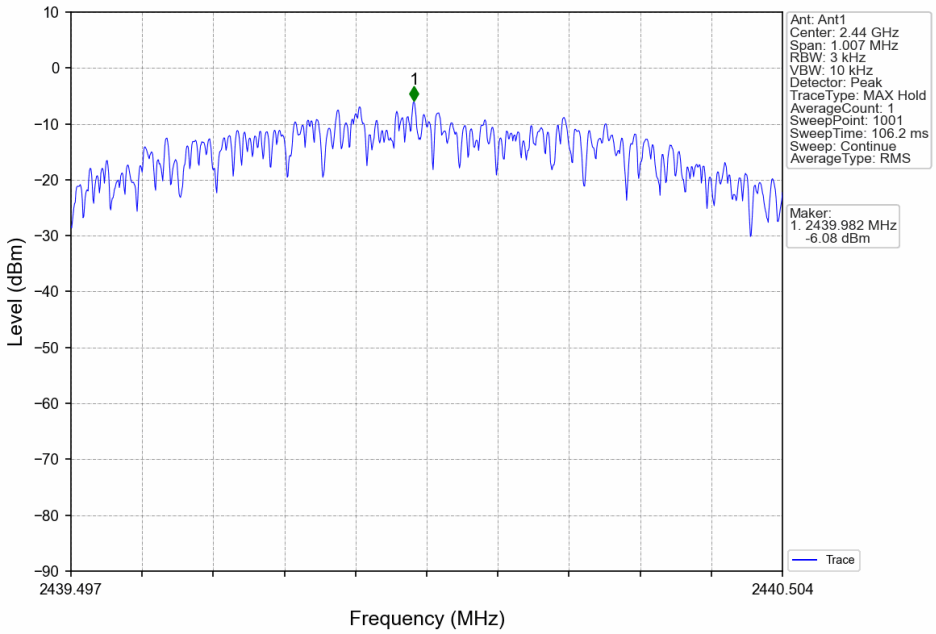
4.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



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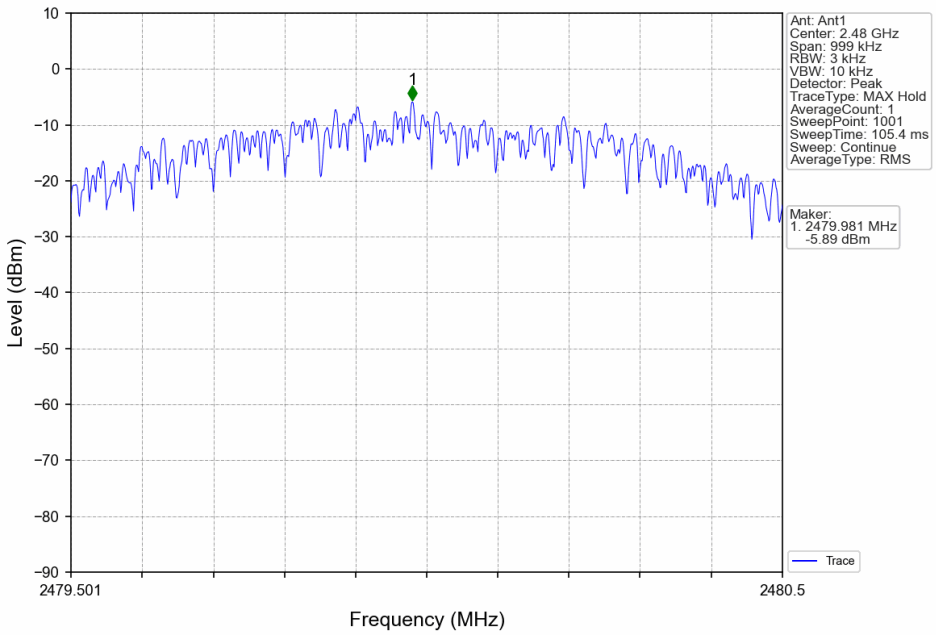
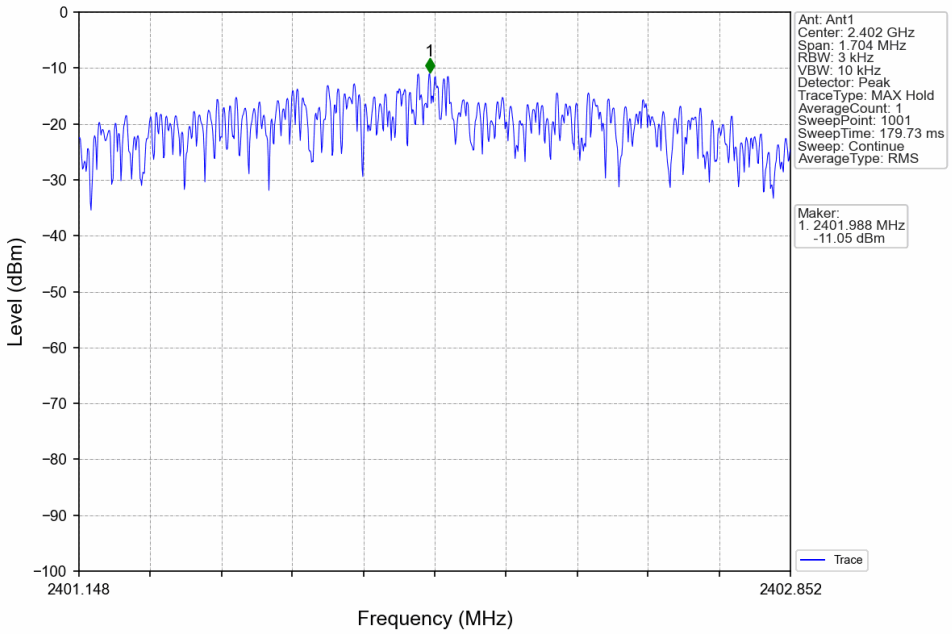
1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



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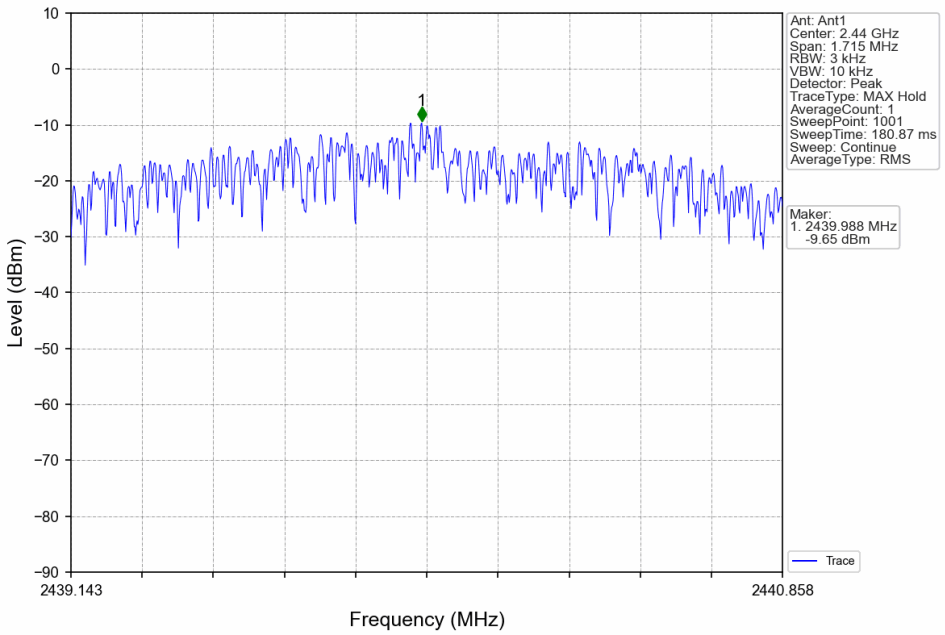
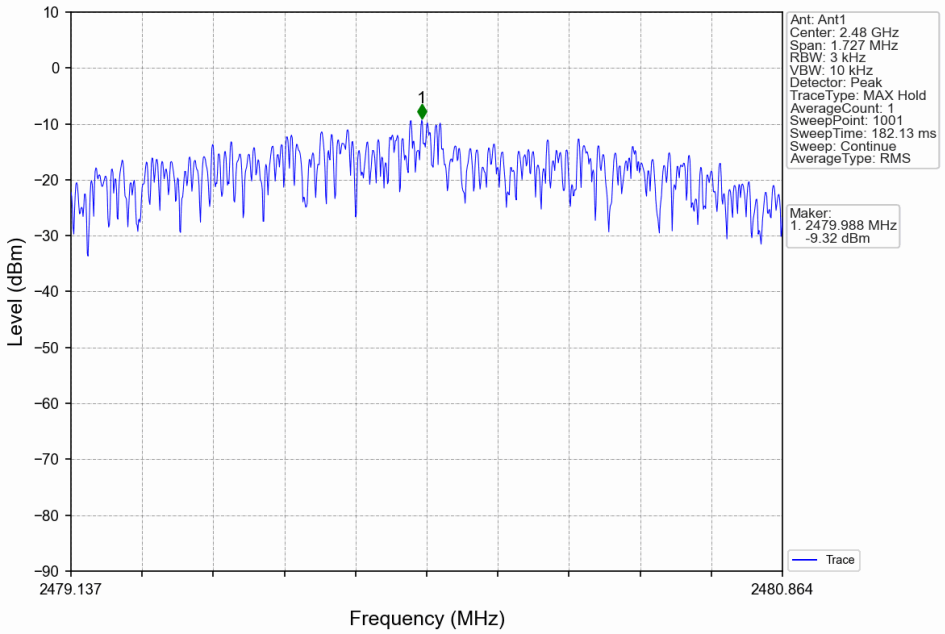
2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



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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)
1M	SISO	2402	1	7.18
		2440	1	8.56
		2480	1	8.58
2M	SISO	2402	1	7.01
		2440	1	8.37
		2480	1	8.67

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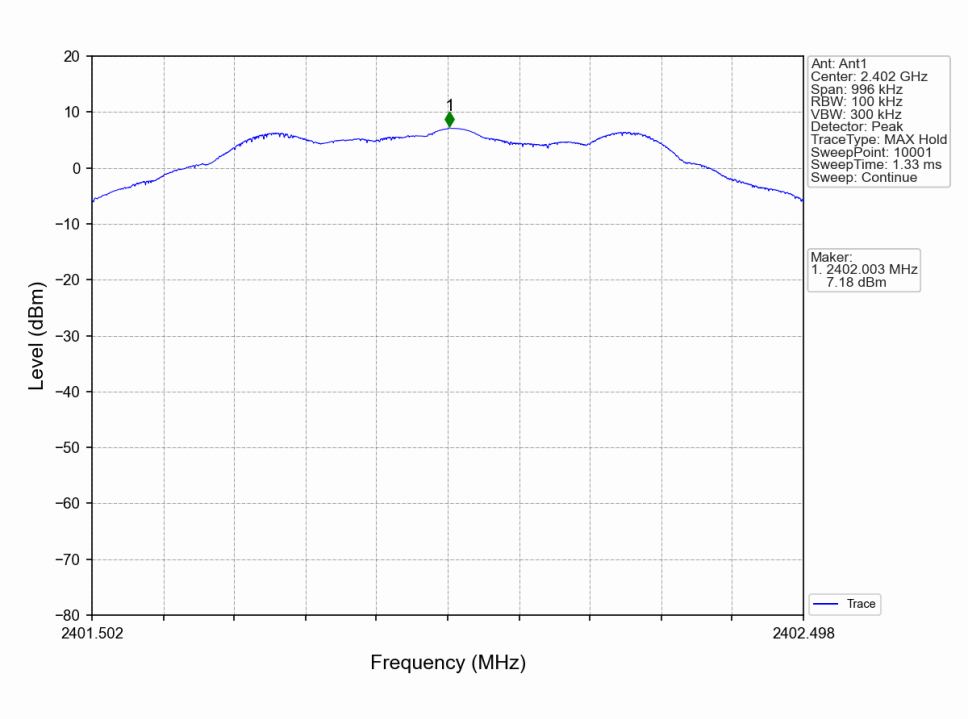
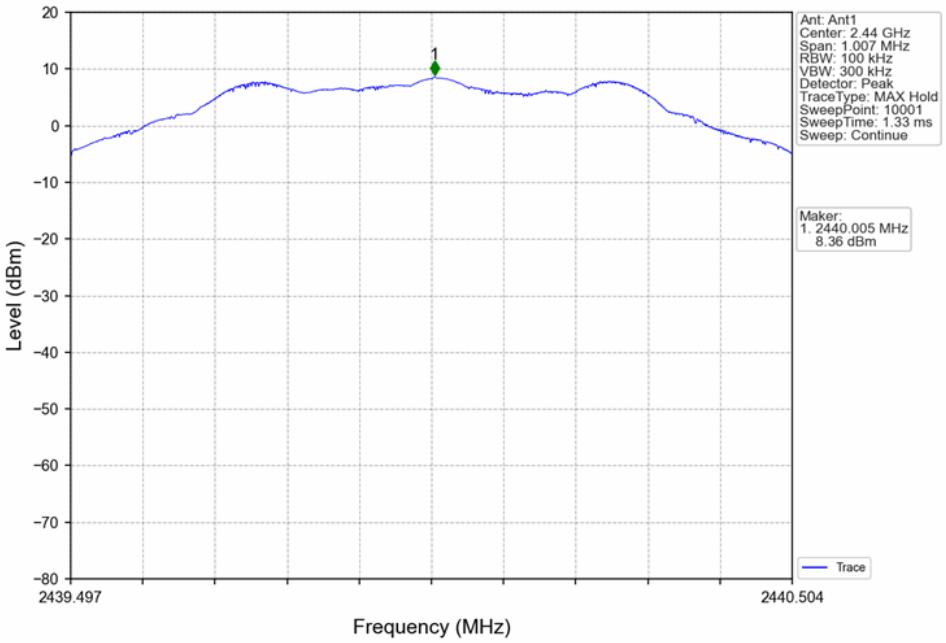
5.1.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



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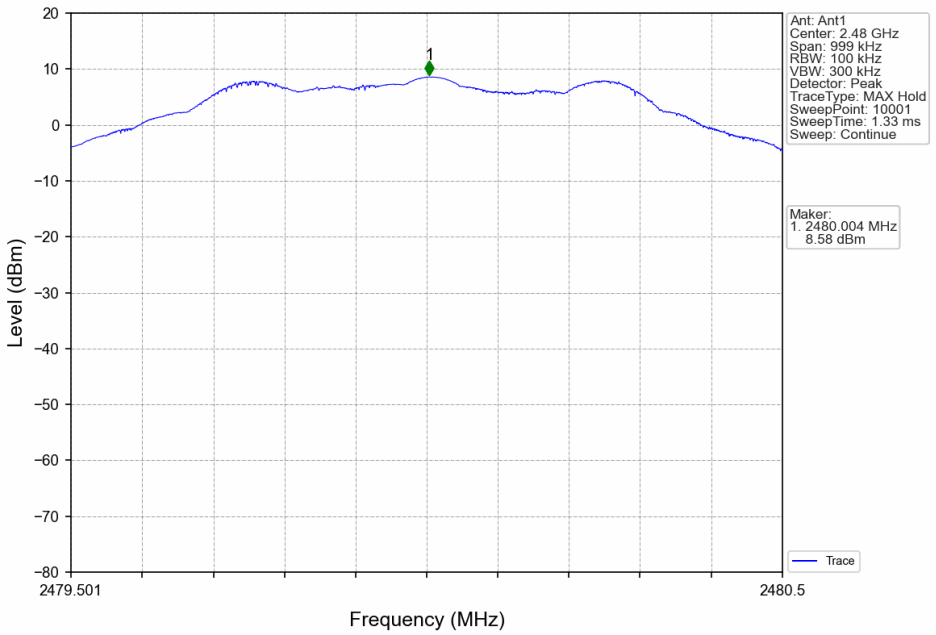
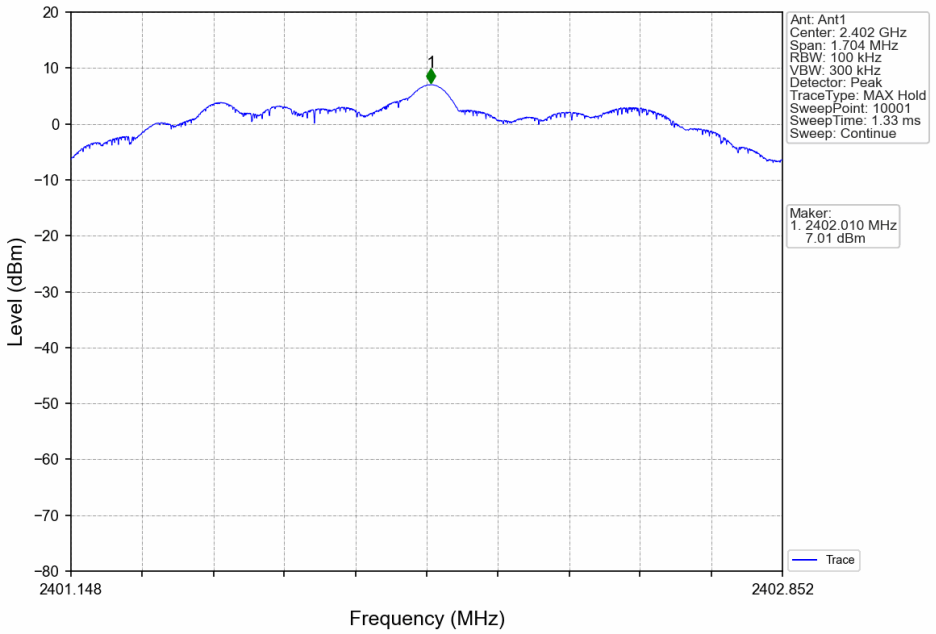
1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



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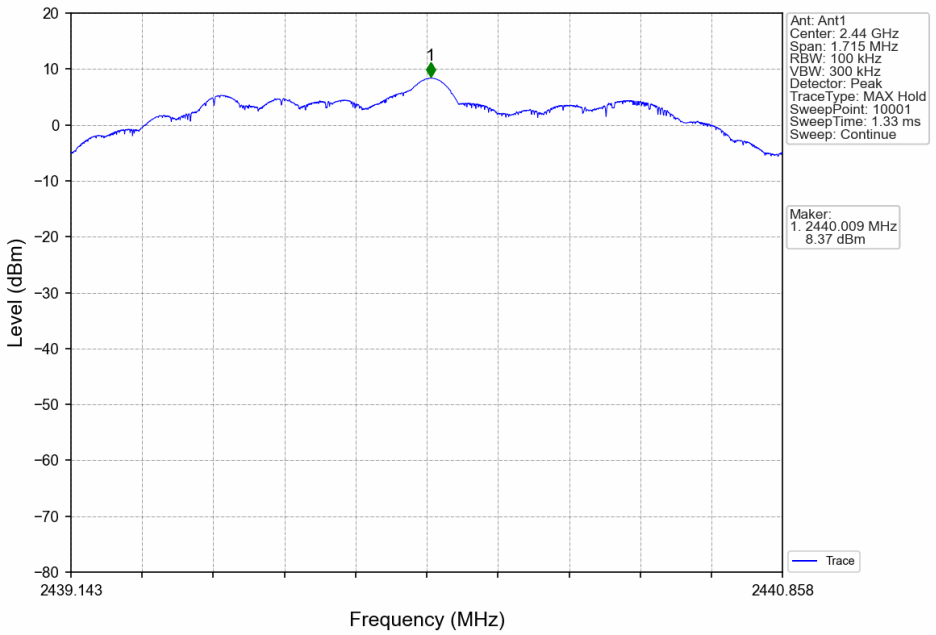
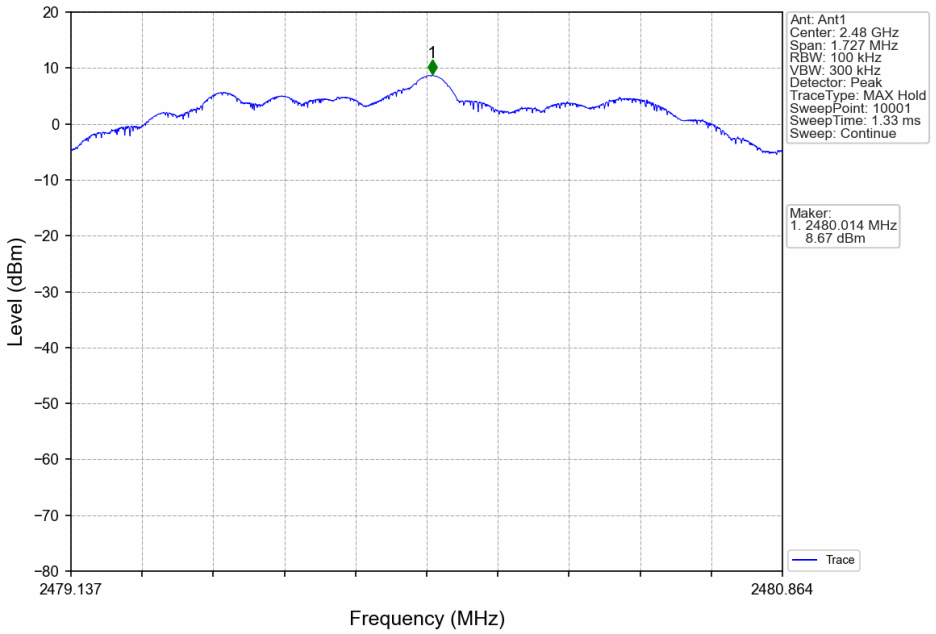
2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



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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
1M	SISO	2402	1	8.58	-11.42	Pass
		2440	1	8.58	-11.42	Pass
		2480	1	8.58	-11.42	Pass
2M	SISO	2402	1	8.67	-11.33	Pass
		2440	1	8.67	-11.33	Pass
		2480	1	8.67	-11.33	Pass

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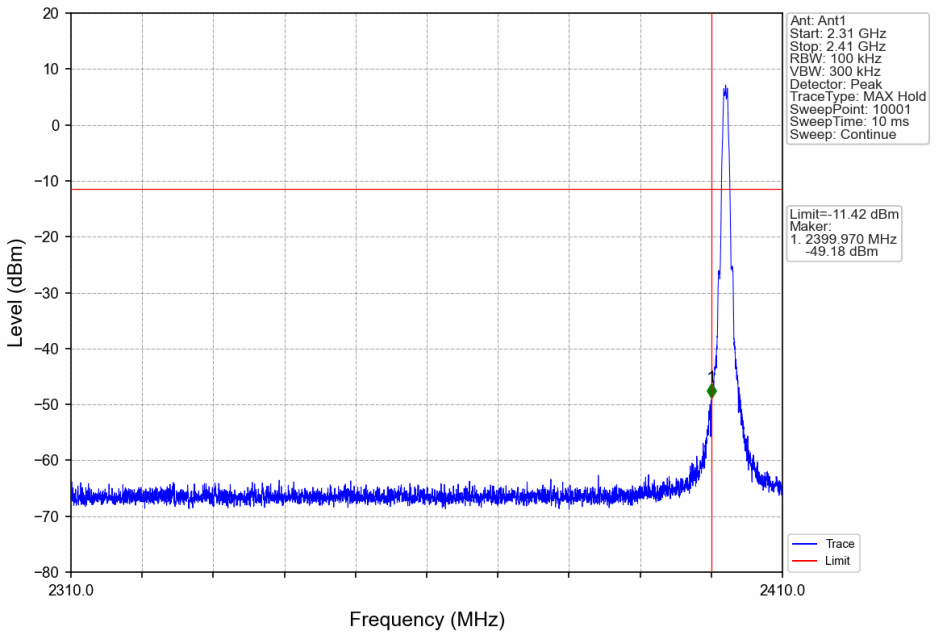
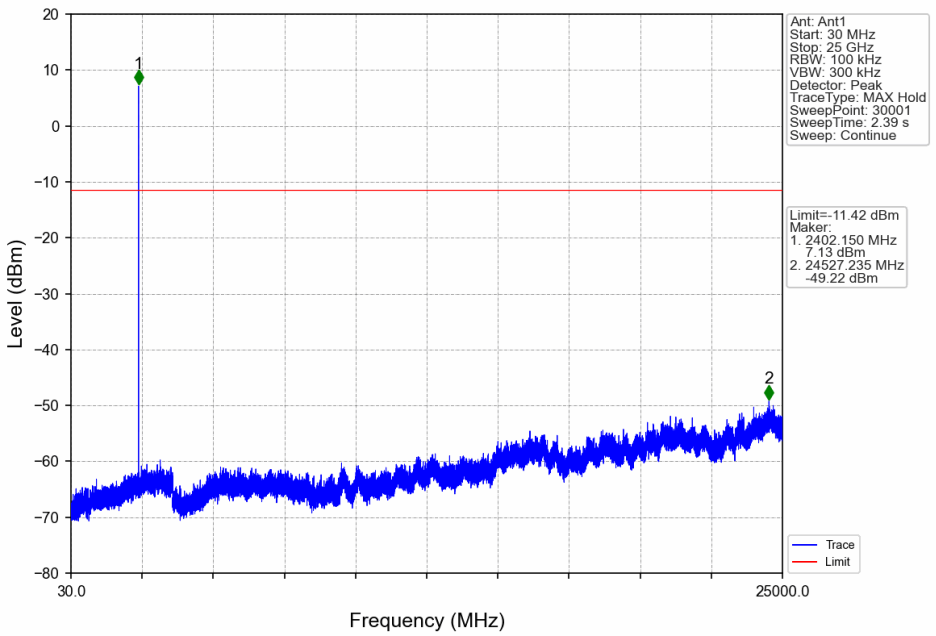
5.2.2 Test Graph

1M_LCH_2402MHz_Ant1_NTNV



1M_LCH_2402MHz_Ant1_NTNV



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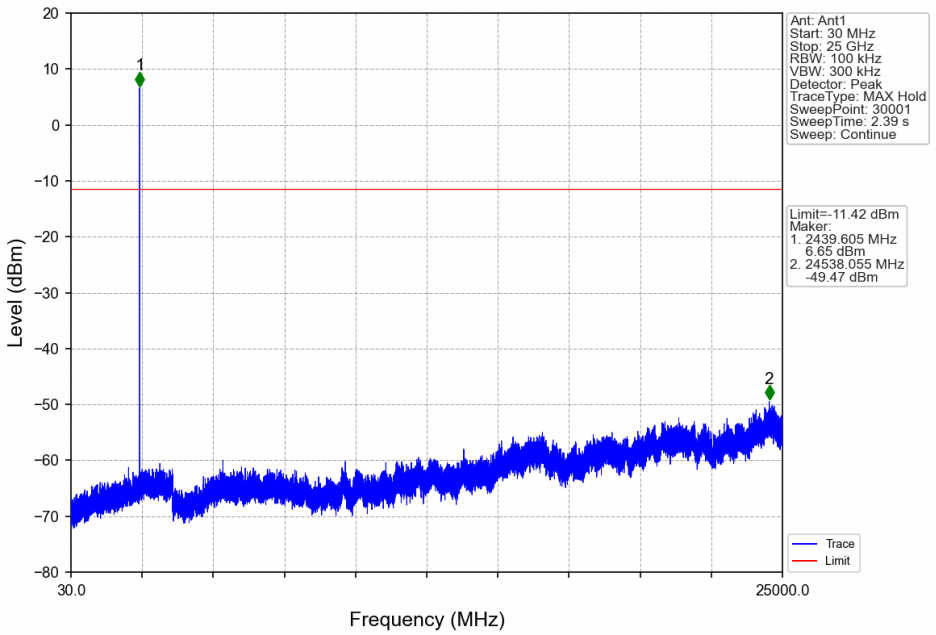
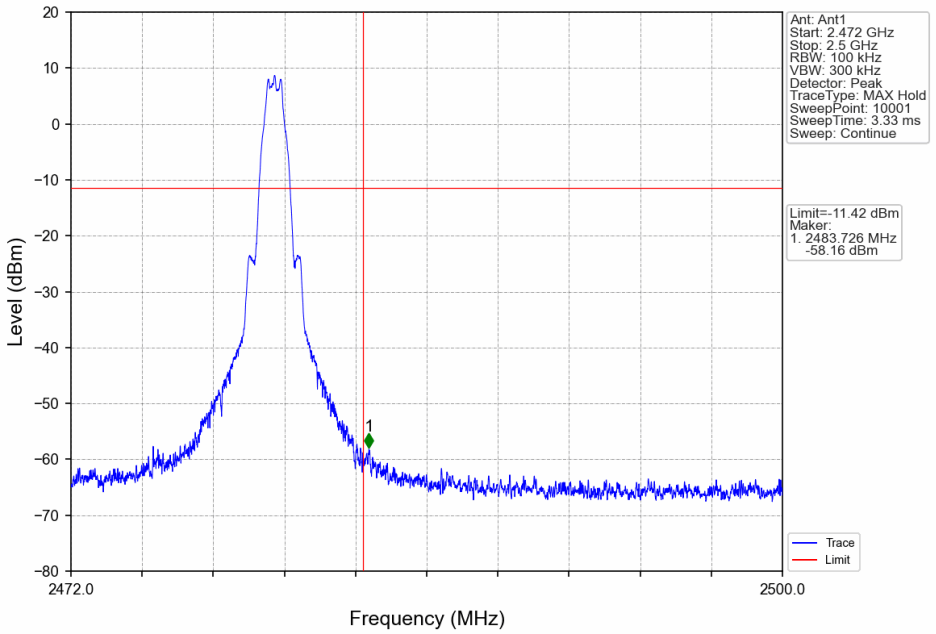
1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



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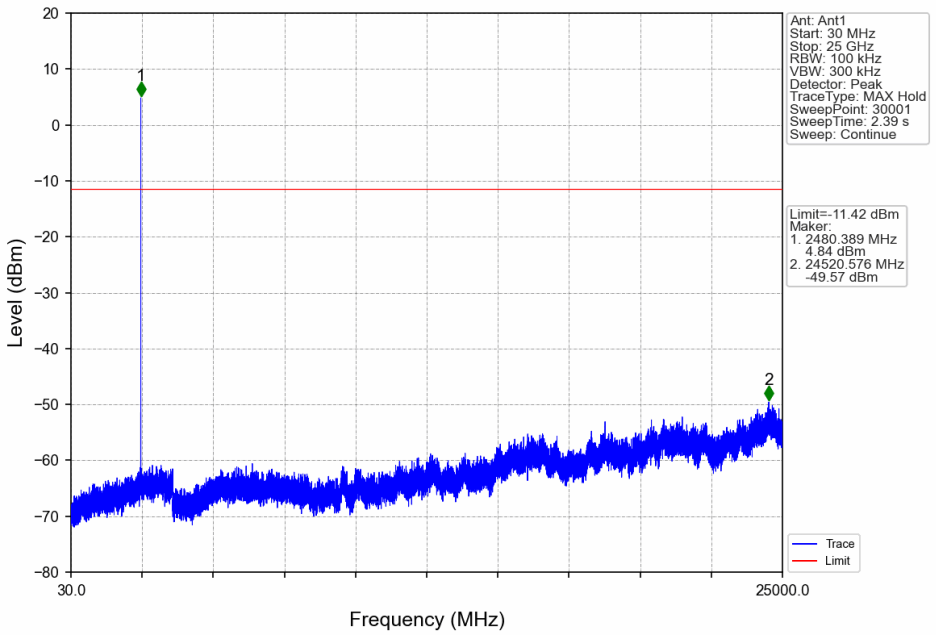
1M_HCH_2480MHz_Ant1_NTNV



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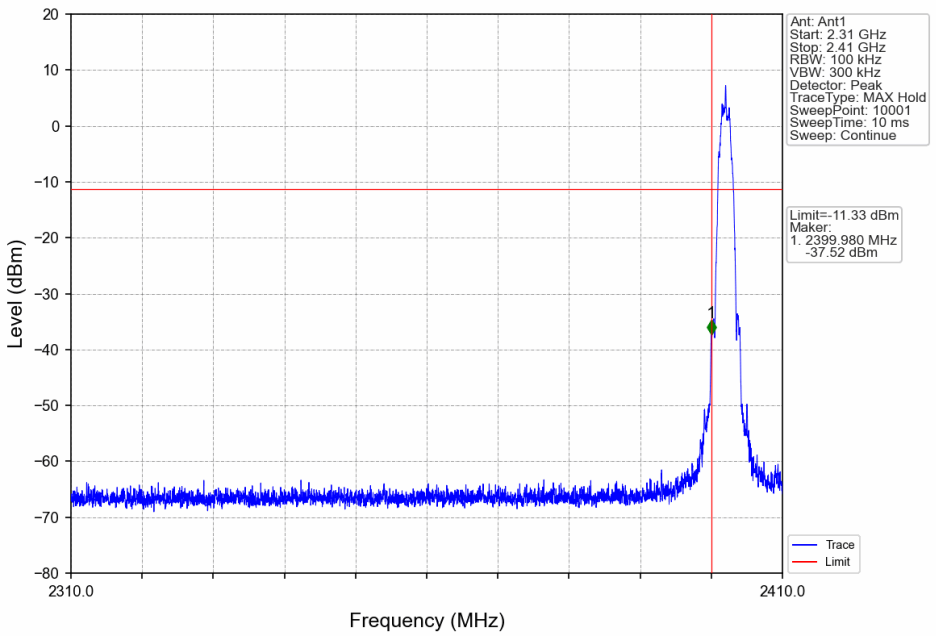

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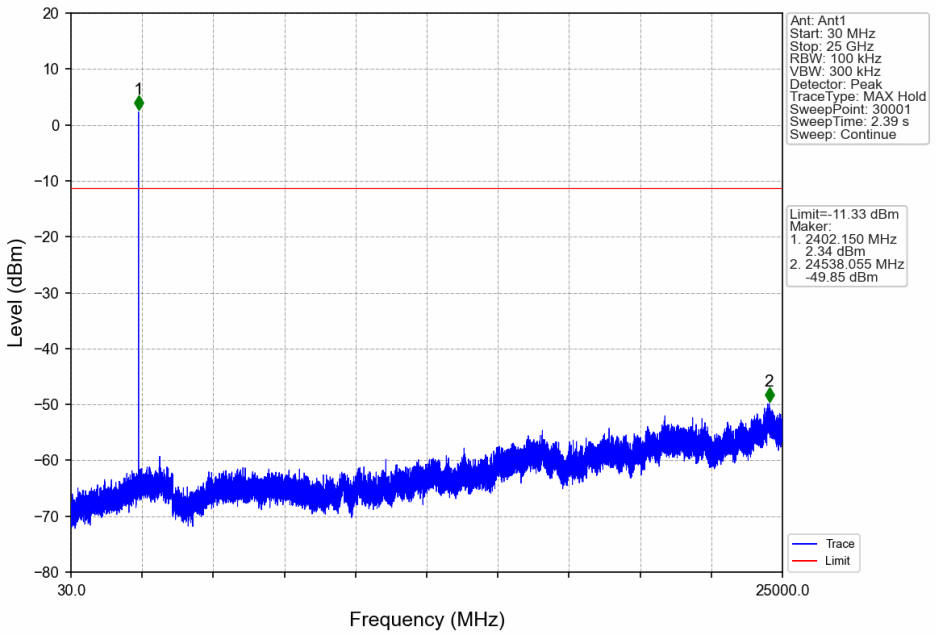
2M_LCH_2402MHz_Ant1_NTNV



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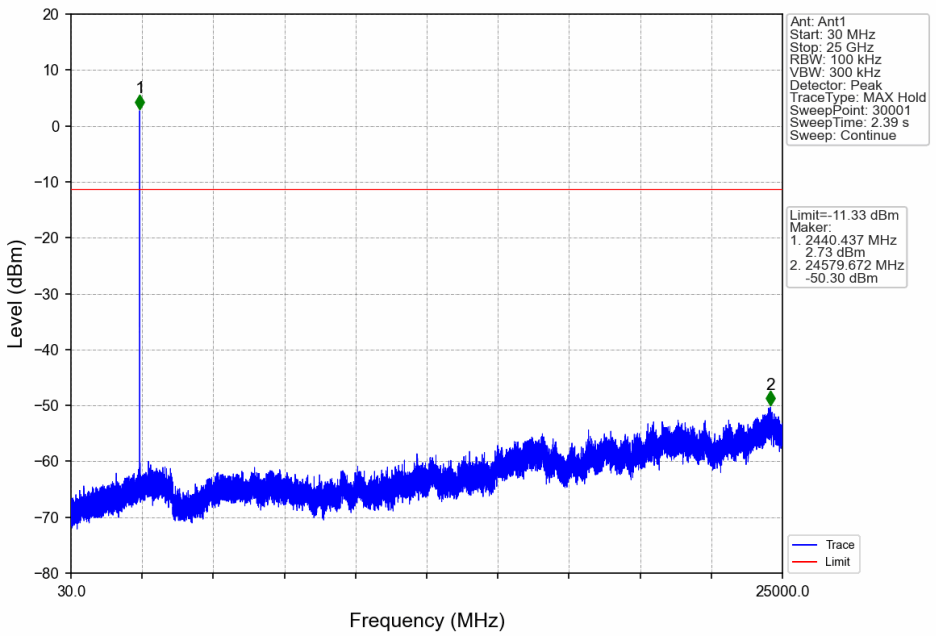

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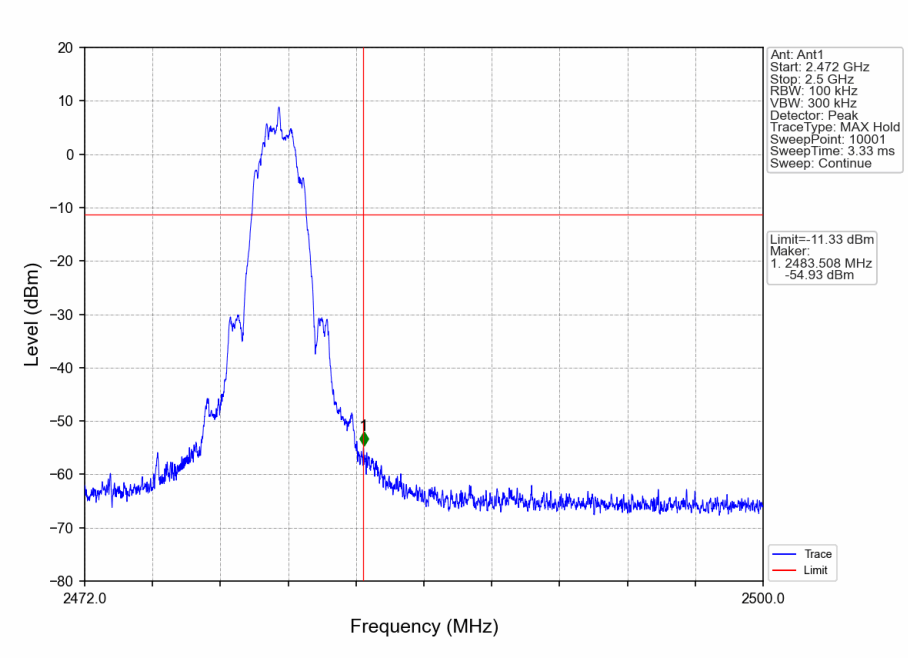
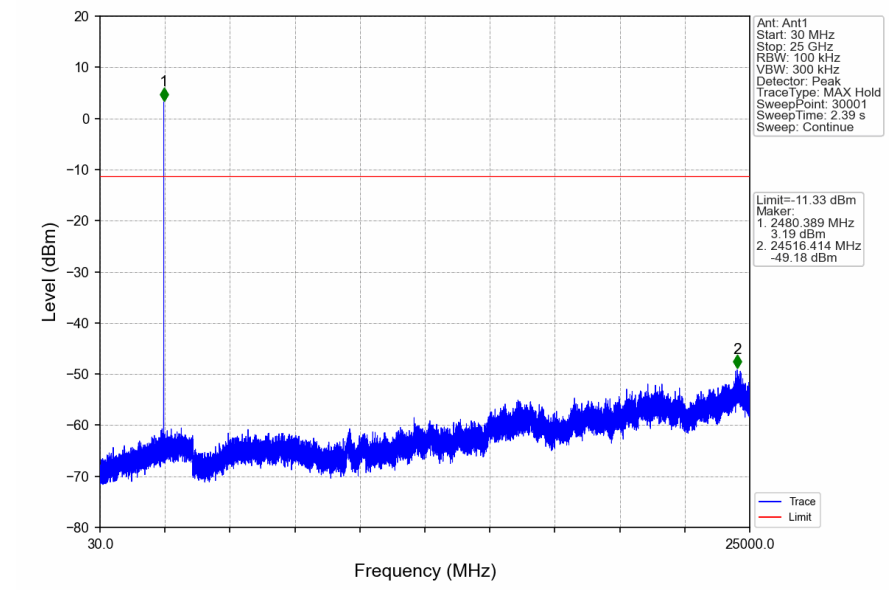
2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



- End of the Report -

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