TEST REPORT

Application No.:	GZCR2401000037HS
Applicant:	Goal Zero LLC
Address of Applicant:	12388 S 265 W, Draper, UT 84020 USA
Manufacturer:	Goal Zero LLC
Address of Manufacturer:	12388 S 265 W, Draper, UT 84020 USA
Factory:	Foshan Alpicool Holding Group Co., Ltd.
Address of Factory:	No.3, ZhenZhu Road, Yang'e, Lunjiao, Shunde, Foshan, Guangdong, China
Product Name:	Portable Fridge
Model No.:	ALTA50, 94025, ALTA80, 94030 ♣
♣	Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Trade Mark:	GOALZERO
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2024-01-09
Date of Test:	2024-01-18 to 2024-03-15
Date of Issue:	2024-04-08
Test Result:	**Pass***

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

Ricky Liu
Manager

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663 t (86-20) 82155555 www.sgsgroup.com.cn
中国・广东・广州高新技术产业开发区科学城科珠路198号 邮编：510663 t (86-20) 82155555 sgs.china@sgs.com

Revision Record			
Version	**Report No.**	**Date**	**Remark**
01	GZCR240100003702	2024-04-08	Original

Authorized for issue by				
		Jim Li **Jim Li/Project Engineer**		
		Vico Cui **Vico Cui/Reviewer**		

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663 t (86-20) 82155555 www.sgsgroup.com.cn
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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 11.12	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
**: The EUT passed Radiated Spurious Emissions Below 1GHz test after modification.				

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

♣ Declaration of EUT Family Grouping:

Model No.: ALTA50, 94025, ALTA80, 94030

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the appearance, volume, solenoid valves, display board & model name.

Model1	Model2	Difference.
ALTA50	94025	Model name.
ALTA80	94030	Model name.

Therefore models ALTA50 (M1), ALTA80 (M2) were tested in this report.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	AC/DC ADAPTER
	MODEL: GRT90-145600
	INPUT: 100-240V~/2.5A Max, 50/60Hz
	OUTPUT: 14.5V, 6.0A, 87.0W
Test voltage:	AC 120V, 60Hz
Cable(s):	Adapter AC input cable, 2 wires, 1.5m, unshielded.
	Adapter DC output cable, 2 wires, 0.5m, unshielded.
	Vehicle 12V/24V DC cable, 2.8m, unshielded.
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	1.68 dBi according to the antenna specification
Antenna Number:	1

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

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Note Book Computer	LENOVO	ThinkPad T490	PF1D1MVJ

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	±2.76dB
Conducted Peak Output Power	± 0.75dB
Minimum 6dB Bandwidth	± 3%
Power Spectrum Density	± 2.84dB
Conducted Band Edges Measurement	± 0.75dB
Conducted Spurious Emissions	± 0.75dB
Radiated Emissions which fall in the restricted bands	±5.00dB (30MHz-1GHz; 3m);±4.38dB (30MHz-1GHz; 10m);± 5.12dB (1GHz-6GHz); ±5.38dB (6GHz-18GHz); ±5.61dB(18GHz-40GHz)
Radiated Spurious Emissions Below 1GHz	±5.00dB (3m); ±4.38dB (10m)
Radiated Spurious Emissions Above 1GHz	±5.12dB (1GHz-6GHz); ±5.38dB (6GHz-18GHz); ±5.61dB(18GHz-40GHz)
Remark: The U_{lab} (lab Uncertainty) is less than U_{ETSI} (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.	

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.

4.5 Test Facility

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

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

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**
Coaxial Cable	HangTianXing	2m	EMC0107	2023-08-04	2024-08-03
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2022-10-16	2025-10-15
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2023-09-08	2024-09-07
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2023-05-19	2024-05-18
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A

Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2023-08-23	2024-08-22
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2023-08-23	2024-08-22
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Power Spectrum Density					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2023-08-23	2024-08-22
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2023-08-23	2024-08-22
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MI CABLE	SGS-EMC	0.8M	EMC2137	2023-11-02	2025-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2023-08-23	2024-08-22
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2023-11-10	2024-11-09
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2023-12-15	2024-12-14
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2023-06-18	2026-06-17
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2023-10-20	2024-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2023-12-20	2026-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Spurious Emissions Below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
966 Anechoic Chamber	Shenzhen C.R.T	CRTSGSSAC966	EMC2230	2022-04-12	2025-04-11
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2229	2024-02-19	2025-02-18
Amplifier(9k-1000MHz)	SONOMA	310	EMC2237	2023-04-13	2024-04-12
TRILOG Broadband Antenna（25M-2GHz)	SCHWRZBECK	VULB 9168	EMC2238	2022-04-20	2025-04-19
Coaxial Cable	Mirco-COAX UTIFLEX ve	LA2-C125-8000	EMC2239	2023-06-14	2025-06-13
Test Software E3	Audix	Ver.6.191211	GZE100-81	N/A	N/A
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2022-04-06	2024-04-05

Radiated Spurious Emissions Above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2023-11-10	2024-11-09
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2023-12-15	2024-12-14
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2023-06-18	2026-06-17
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2023-11-10	2024-11-09
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2023-08-23	2024-08-22
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2023-10-20	2024-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2023-12-20	2026-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2023-06-11	2024-06-10

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 1.68 dBi.

Antenna location: Refer to internal photo.

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

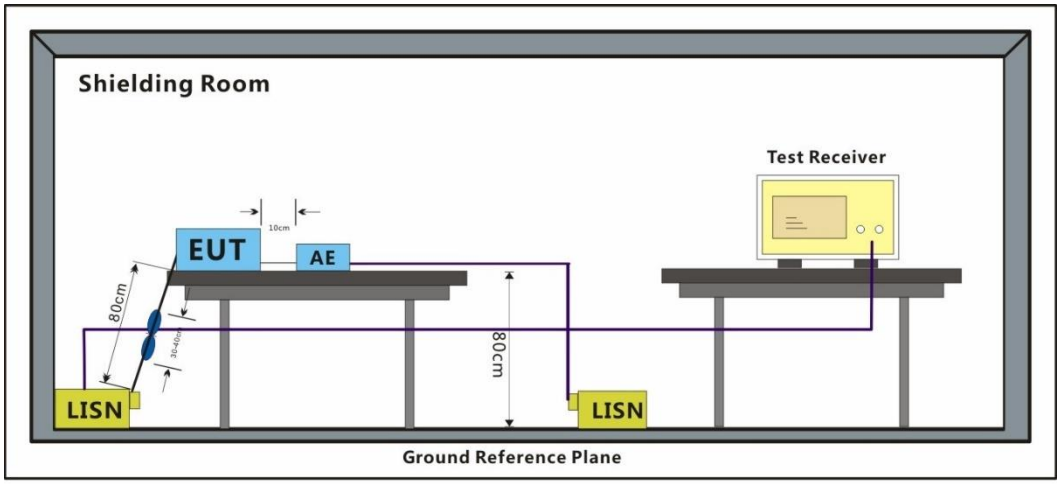
Operating Environment:

Temperature: 22.2 °C Humidity: 52.7 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA50 and Powered Supply by AC/DC ADAPTER).
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA80 and Powered Supply by AC/DC ADAPTER).

7.1.3 Test Setup Diagram



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.

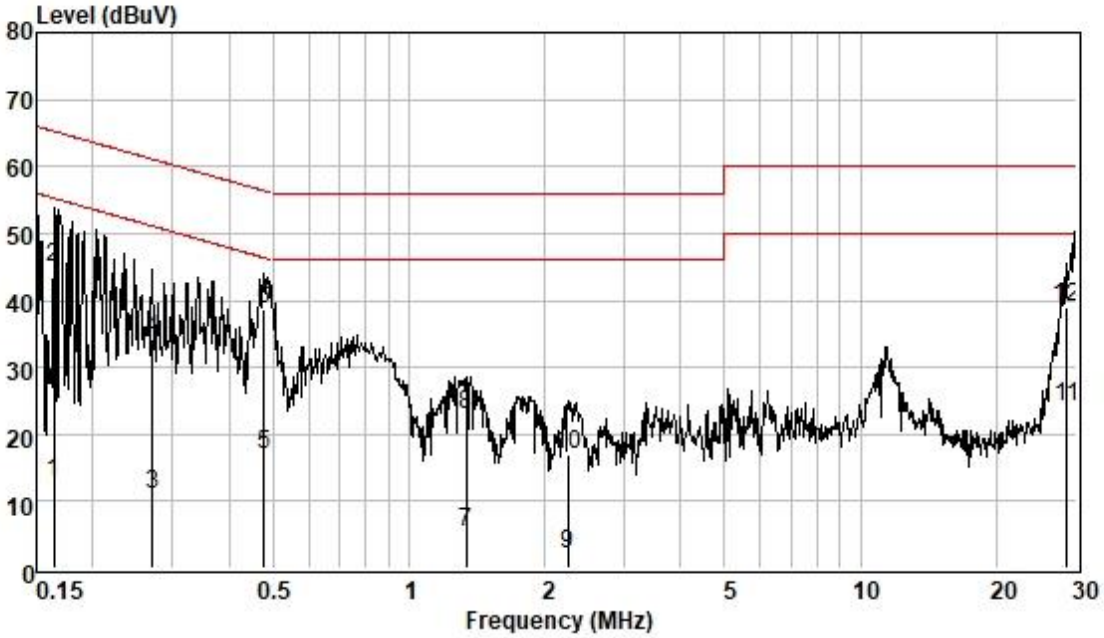
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

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

Test Mode: 00; Line: Live line



Pol :LINE
Mode :
Model :A50
Power :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.164	3.19	0.04	9.55	12.78	55.25	-42.47	Average
2	0.164	35.32	0.04	9.55	44.91	65.25	-20.34	QP
3	0.272	1.43	0.04	9.56	11.03	51.07	-40.04	Average
4	0.272	24.64	0.04	9.56	34.24	61.07	-26.83	QP
5	0.479	7.37	0.05	9.56	16.98	46.36	-29.38	Average
6	0.479	28.93	0.05	9.56	38.54	56.36	-17.82	QP
7	1.338	-4.37	0.09	9.56	5.28	46.00	-40.72	Average
8	1.338	13.22	0.09	9.56	22.87	56.00	-33.13	QP
9	2.249	-7.62	0.13	9.57	2.08	46.00	-43.92	Average
10	2.249	7.23	0.13	9.57	16.93	56.00	-39.07	QP
11	28.603	13.71	0.45	9.88	24.04	50.00	-25.96	Average
12	28.603	28.71	0.45	9.88	39.04	60.00	-20.96	QP

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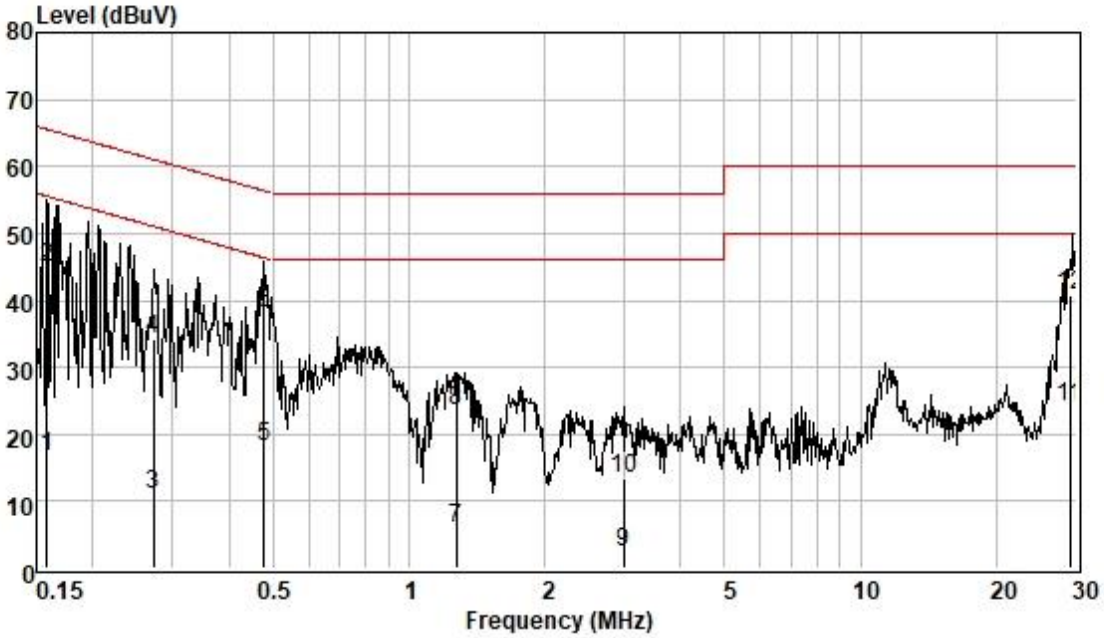
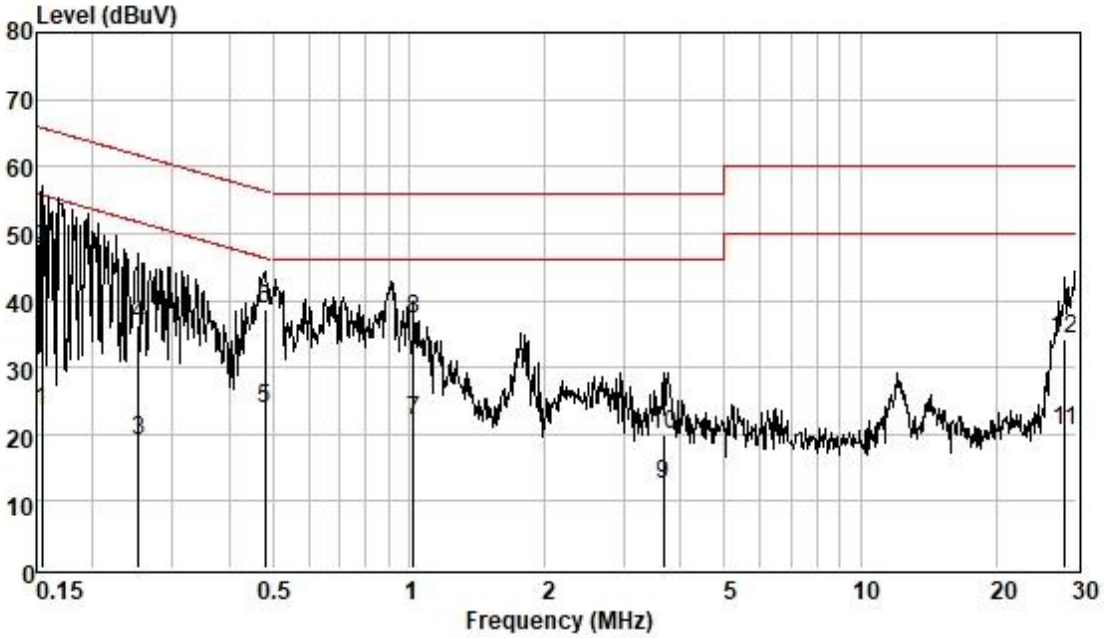
Test Mode: 00; Line: Neutral Line



Pol :NEUTRAL
Mode :
Model :A50
Power :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.158	7.22	0.04	9.52	16.78	55.56	-38.78	Average
2	0.158	35.30	0.04	9.52	44.86	65.56	-20.70	QP
3	0.273	1.54	0.04	9.53	11.11	51.03	-39.92	Average
4	0.273	24.49	0.04	9.53	34.06	61.03	-26.97	QP
5	0.479	8.45	0.05	9.54	18.04	46.36	-28.32	Average
6	0.479	28.45	0.05	9.54	38.04	56.36	-18.32	QP
7	1.276	-3.66	0.09	9.55	5.98	46.00	-40.02	Average
8	1.276	13.75	0.09	9.55	23.39	56.00	-32.61	QP
9	2.993	-7.36	0.16	9.57	2.37	46.00	-43.63	Average
10	2.993	3.69	0.16	9.57	13.42	56.00	-42.58	QP
11	29.061	13.66	0.45	10.01	24.12	50.00	-25.88	Average
12	29.061	30.22	0.45	10.01	40.68	60.00	-19.32	QP

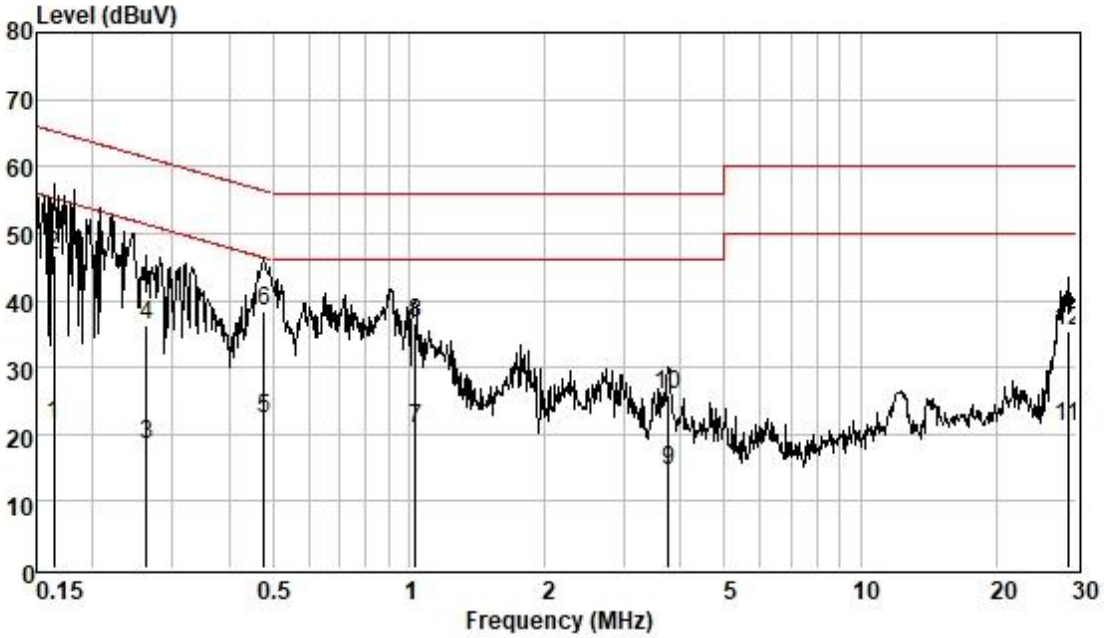
Test Mode: 03; Line: Live line



Pol :LINE
Mode :
Model :A80
Power :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.154	13.89	0.04	9.55	23.48	55.78	-32.30	Average
2	0.154	38.03	0.04	9.55	47.62	65.78	-18.16	QP
3	0.252	9.43	0.04	9.56	19.03	51.69	-32.66	Average
4	0.252	26.76	0.04	9.56	36.36	61.69	-25.33	QP
5	0.481	14.14	0.05	9.56	23.75	46.32	-22.57	Average
6	0.481	29.09	0.05	9.56	38.70	56.32	-17.62	QP
7	1.027	12.48	0.07	9.57	22.12	46.00	-23.88	Average
8	1.027	27.49	0.07	9.57	37.13	56.00	-18.87	QP
9	3.661	2.83	0.17	9.59	12.59	46.00	-33.41	Average
10	3.661	10.14	0.17	9.59	19.90	56.00	-36.10	QP
11	28.302	10.09	0.45	9.88	20.42	50.00	-29.58	Average
12	28.302	23.98	0.45	9.88	34.31	60.00	-25.69	QP

Test Mode: 03; Line: Neutral Line



Pol :NEUTRAL
Mode :
Model :A80
Power :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.164	11.97	0.04	9.52	21.53	55.25	-33.72	Average
2	0.164	37.23	0.04	9.52	46.79	65.25	-18.46	QP
3	0.263	8.76	0.04	9.53	18.33	51.34	-33.01	Average
4	0.263	26.57	0.04	9.53	36.14	61.34	-25.20	QP
5	0.479	12.72	0.05	9.54	22.31	46.36	-24.05	Average
6	0.479	28.86	0.05	9.54	38.45	56.36	-17.91	QP
7	1.032	11.27	0.07	9.55	20.89	46.00	-25.11	Average
8	1.032	27.00	0.07	9.55	36.62	56.00	-19.38	QP
9	3.759	4.67	0.17	9.59	14.43	46.00	-31.57	Average
10	3.759	16.15	0.17	9.59	25.91	56.00	-30.09	QP
11	28.755	10.51	0.45	10.01	20.97	50.00	-29.03	Average
12	28.755	24.89	0.45	10.01	35.35	60.00	-24.65	QP

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

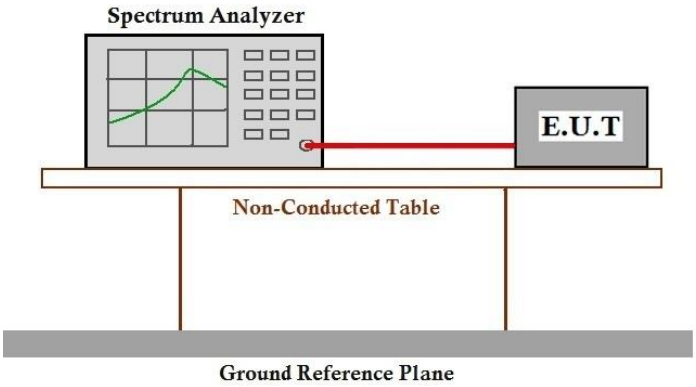
Operating Environment:

Temperature: 21.4 °C Humidity: 66.9 % RH Atmospheric Pressure: 1014 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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

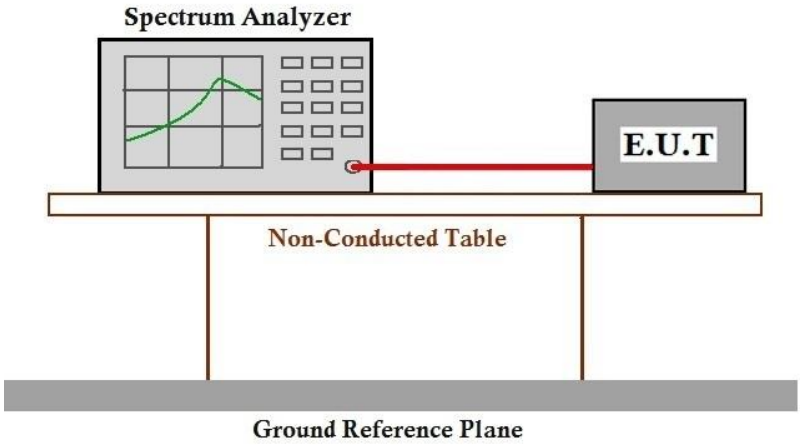
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 21.4 °C Humidity: 66.9 % RH Atmospheric Pressure: 1014 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_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

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

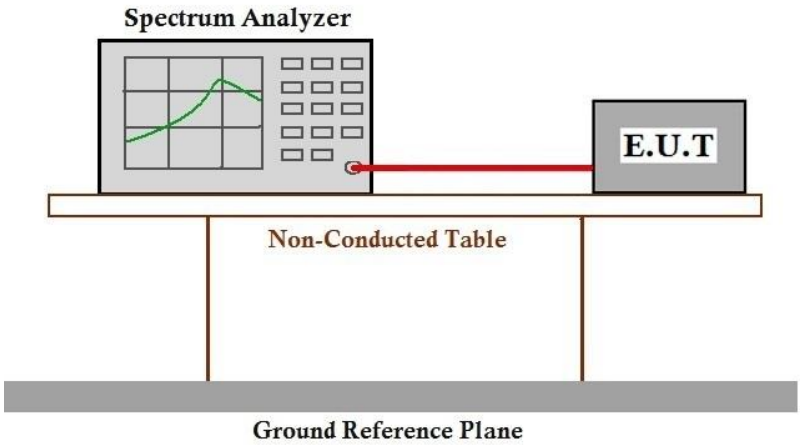
Operating Environment:

Temperature: 21.4 °C Humidity: 66.9 % RH Atmospheric Pressure: 1014 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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

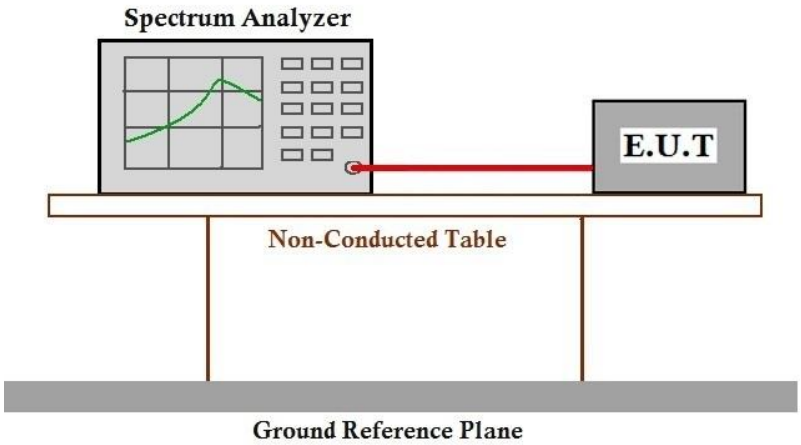
Operating Environment:

Temperature: 21.4 °C Humidity: 66.9 % RH Atmospheric Pressure: 1014 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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

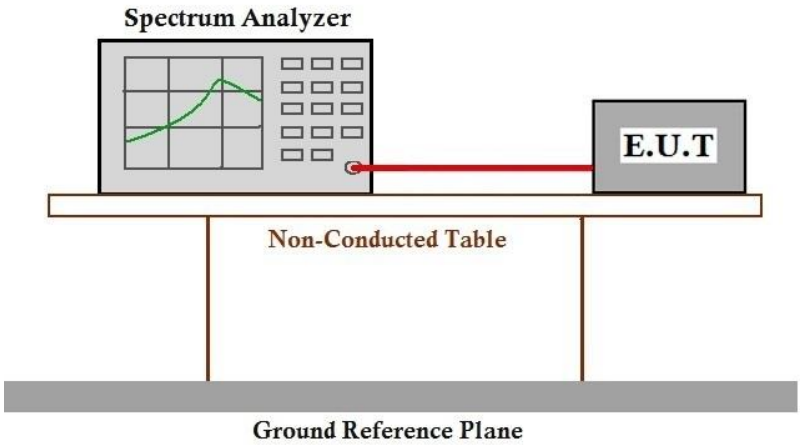
Operating Environment:

Temperature: 21.4 °C Humidity: 66.9 % RH Atmospheric Pressure: 1014 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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 11.12

Limit:

Test Distance: 3 m

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

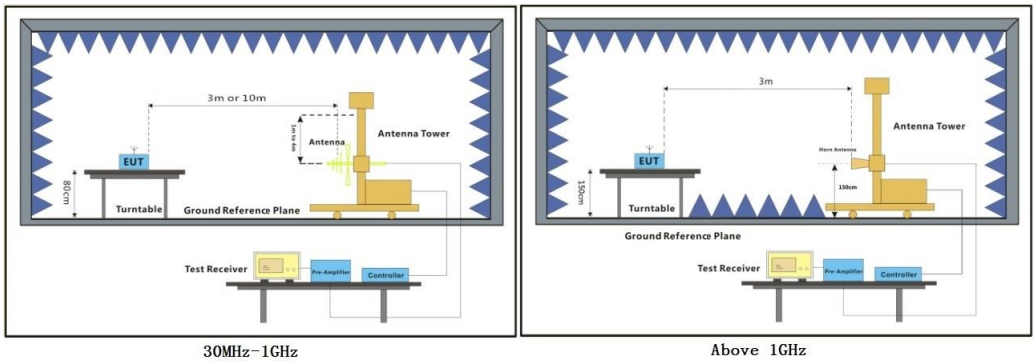
Operating Environment:

Temperature: 21.3 °C Humidity: 62.5 % RH Atmospheric Pressure: 1014 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	13	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

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 Highest channel.

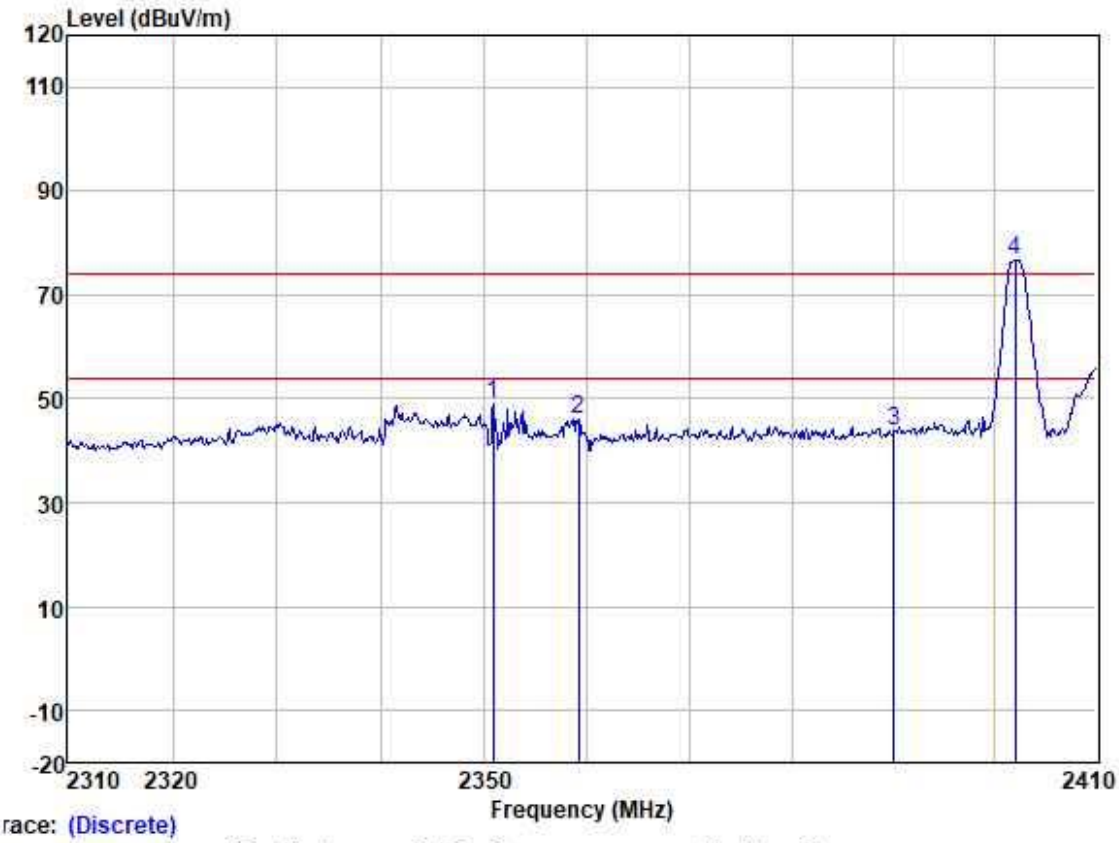
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

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.

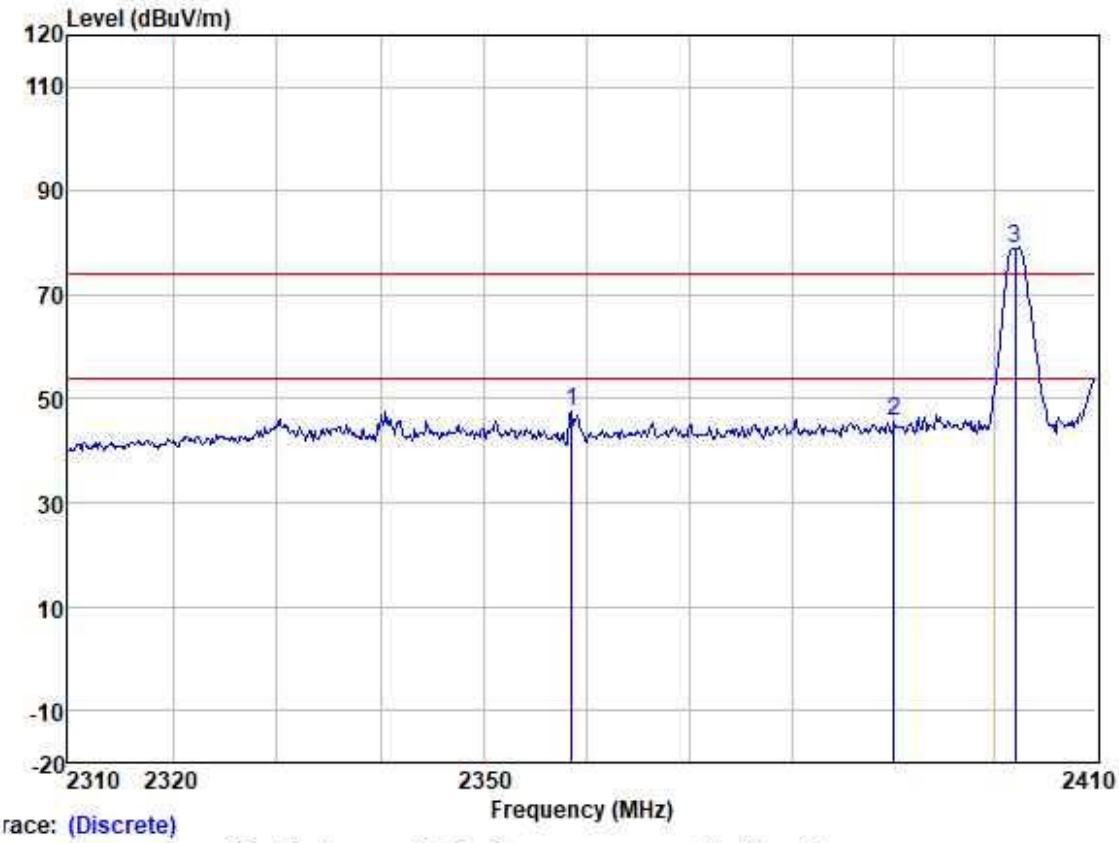
Test Mode: 13; Polarity: Vertical; Modulation: GFSK; Channel:Low



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2350.886	54.85	27.61	3.74	37.23	48.97	74.00	-25.03	VERTICAL	peak
2	2359.170	51.92	27.62	3.75	37.23	46.06	74.00	-27.94	VERTICAL	Peak
3	2390.000	49.64	27.68	3.77	37.21	43.88	74.00	-30.12	VERTICAL	peak
4 *	2402.000	82.31	27.71	3.78	37.21	76.59	74.00	2.59	VERTICAL	peak

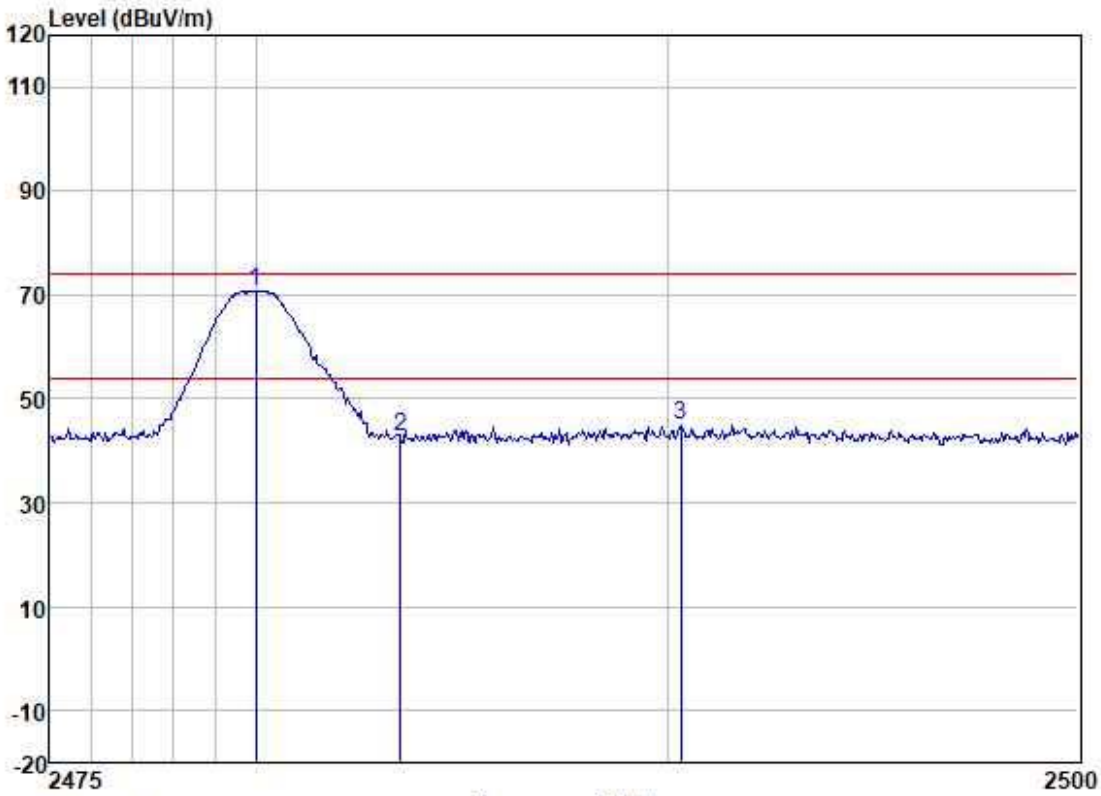
Test Mode: 13; Polarity: Horizontal; Modulation: GFSK; Channel:Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2358.470	53.44	27.62	3.75	37.23	47.58	74.00	-26.42	HORIZONTAL	peak
2	2390.000	51.34	27.68	3.77	37.21	45.58	74.00	-28.42	HORIZONTAL	peak
3 *	2402.000	84.81	27.71	3.78	37.21	79.09	74.00	5.09	HORIZONTAL	peak

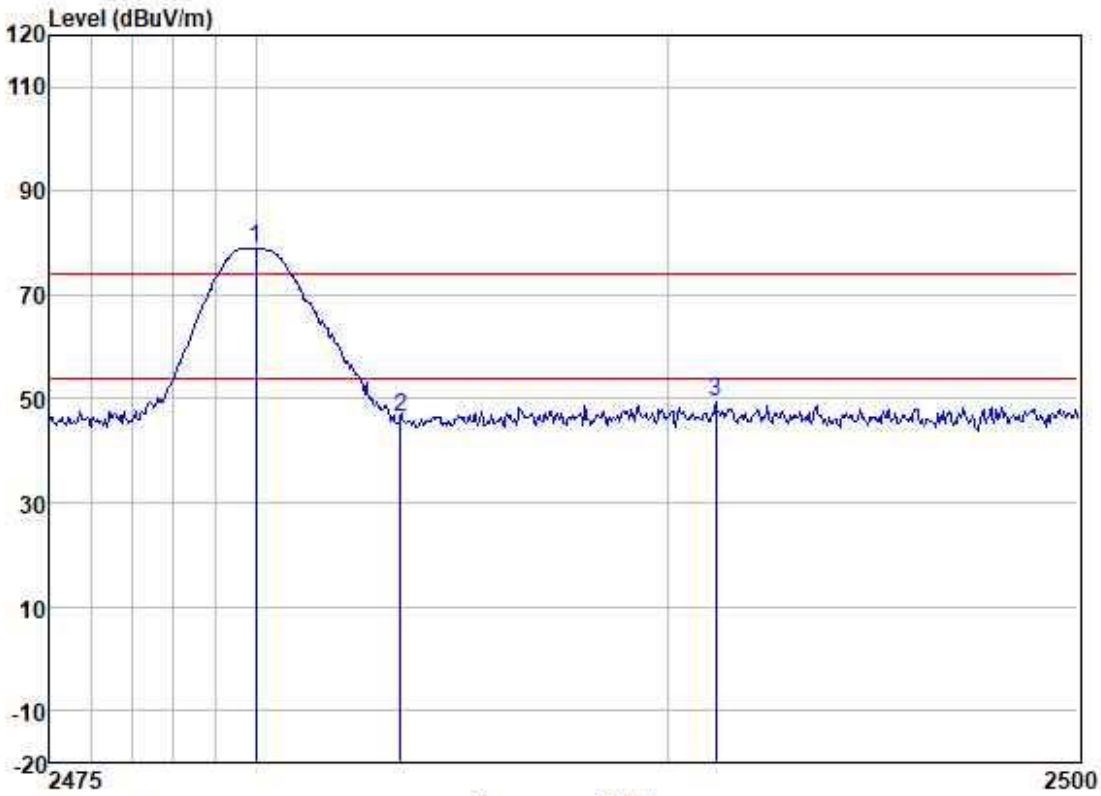
Test Mode: 13; Polarity: Vertical; Modulation: GFSK; Channel:High



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2480.000	76.36	27.84	3.82	37.19	70.83	74.00	-3.17	VERTICAL	peak
2	2483.500	48.06	27.85	3.82	37.19	42.54	74.00	-31.46	VERTICAL	peak
3	2490.320	50.59	27.86	3.83	37.19	45.09	74.00	-28.91	VERTICAL	peak

Test Mode: 13; Polarity: Horizontal; Modulation: GFSK; Channel:High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2480.000	84.28	27.84	3.82	37.19	78.75	74.00	4.75	HORIZONTAL	peak
2	2483.500	51.83	27.85	3.82	37.19	46.31	74.00	-27.69	HORIZONTAL	peak
3	2491.171	54.77	27.86	3.83	37.19	49.27	74.00	-24.73	HORIZONTAL	peak

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

Limit:

Test Distance: 3 m

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

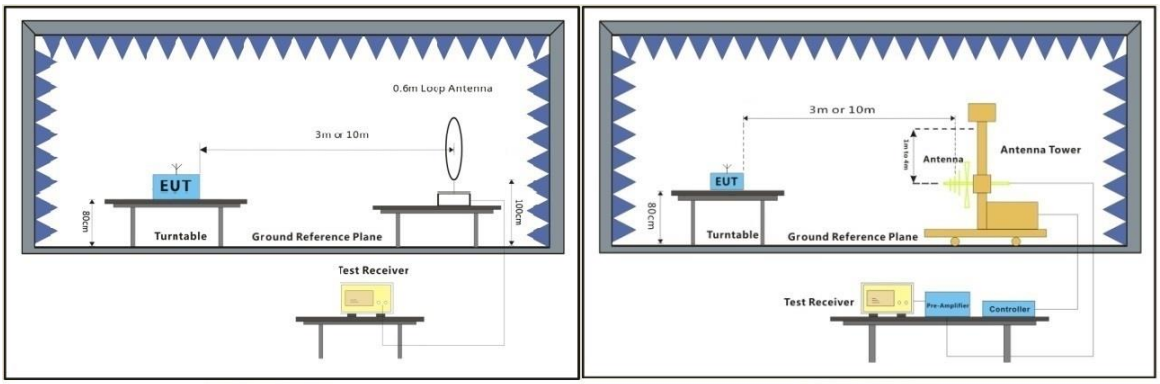
Operating Environment:

Temperature: 22.5 °C Humidity: 52.4 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA50 and Powered Supply by AC/DC ADAPTER).
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA80 and Powered Supply by AC/DC ADAPTER).

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.

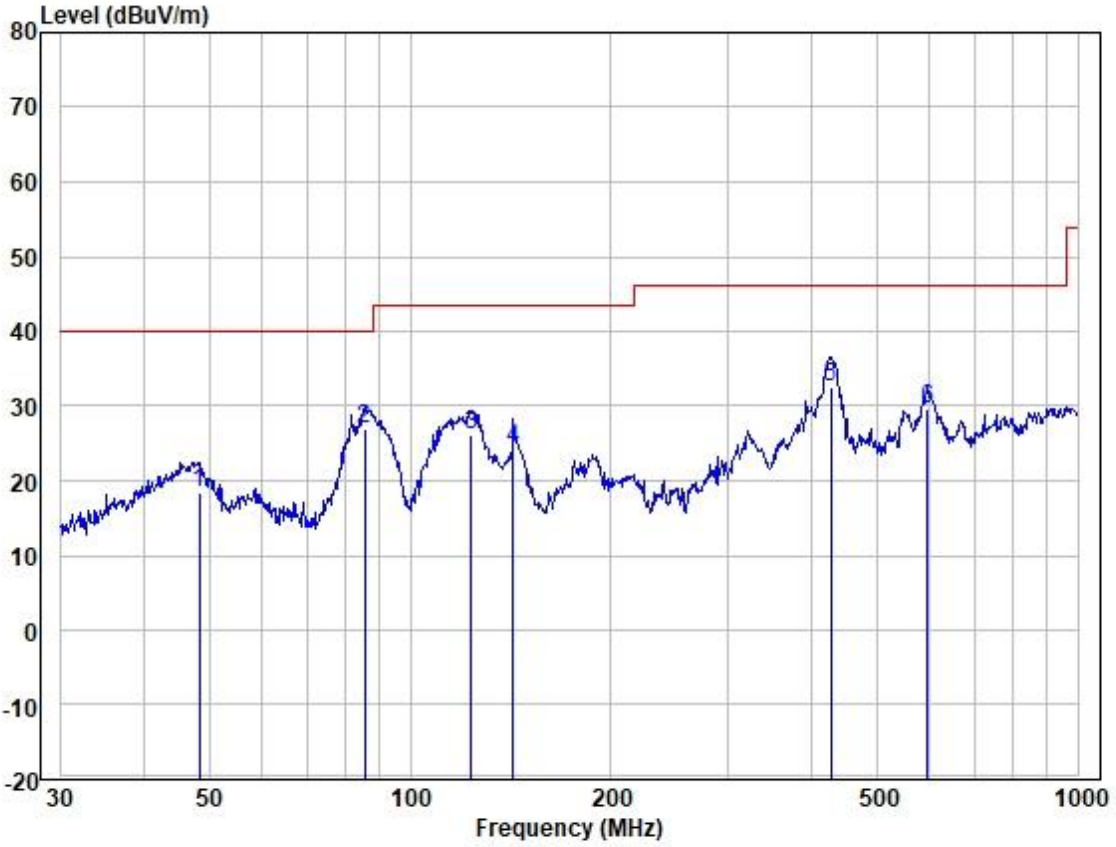
i. Repeat above procedures until all frequencies measured was complete.

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.

Test Mode: 00; Polarity: Horizontal



Site : 966 Chamber
Job :
Model : alta50
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	48.332	31.42	19.52	0.38	32.80	18.52	40.00	-21.48	HORIZONTAL	QP
2	85.598	44.92	14.23	0.51	32.80	26.86	40.00	-13.14	HORIZONTAL	QP
3	123.699	40.83	17.60	0.61	32.80	26.24	43.52	-17.28	HORIZONTAL	QP
4	142.824	37.65	18.74	0.65	32.80	24.24	43.52	-19.28	HORIZONTAL	QP
5	426.521	42.15	22.03	1.18	32.82	32.54	46.02	-13.48	HORIZONTAL	QP
6	595.133	35.62	25.42	1.43	32.90	29.57	46.02	-16.45	HORIZONTAL	QP

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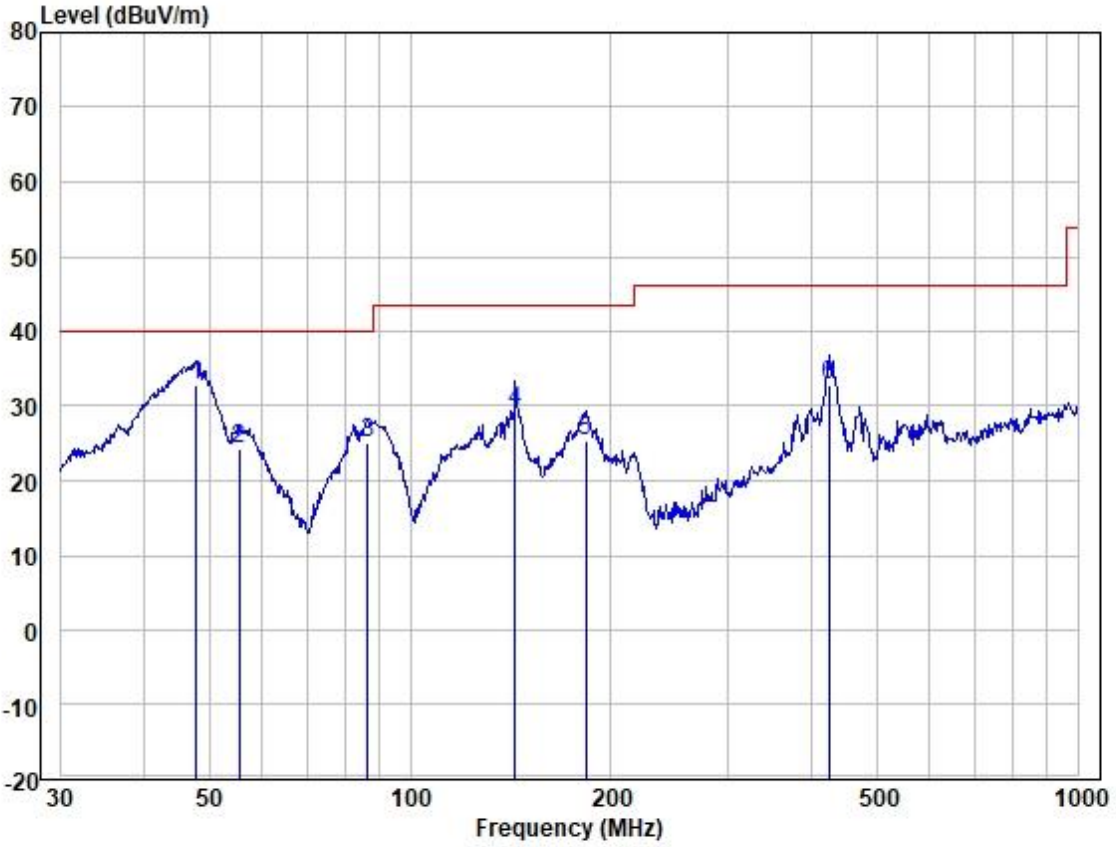
Test Mode: 00; Polarity: Vertical



Site : 966 Chamber
Job :
Model : alta50
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	47.826	45.79	19.50	0.38	32.80	32.87	40.00	-7.13	VERTICAL	QP
2	55.415	37.49	19.28	0.40	32.80	24.37	40.00	-15.63	VERTICAL	QP
3	86.503	43.31	14.12	0.51	32.80	25.14	40.00	-14.86	VERTICAL	QP
4	143.830	42.74	18.77	0.65	32.80	29.36	43.52	-14.16	VERTICAL	QP
5	183.201	40.07	17.23	0.75	32.80	25.25	43.52	-18.27	VERTICAL	QP
6	423.540	42.58	21.93	1.18	32.81	32.88	46.02	-13.14	VERTICAL	QP

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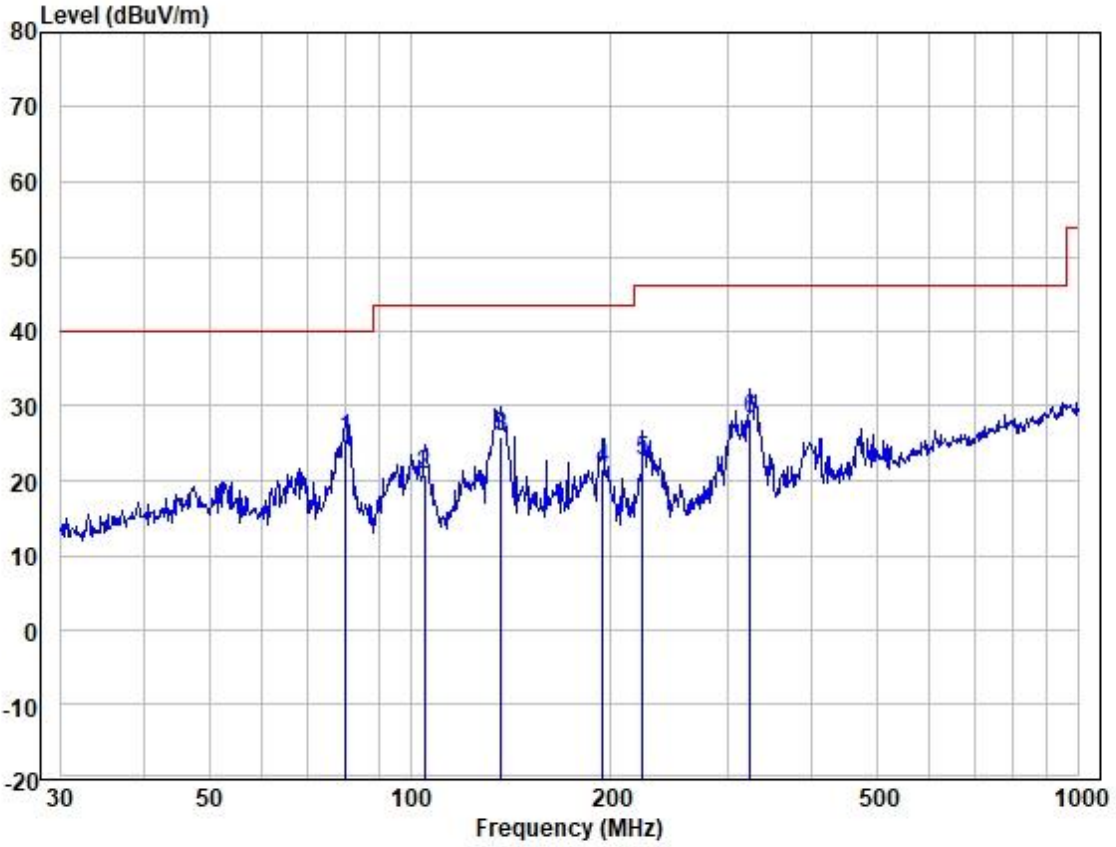
Test Mode: 03; Polarity: Horizontal



Site : 966 Chamber
Job :
Model :
Power :
Test Mode : alta80

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	80.081	42.69	15.17	0.50	32.80	25.56	40.00	-14.44	HORIZONTAL	QP
2	105.272	37.65	15.49	0.55	32.80	20.89	43.52	-22.63	HORIZONTAL	QP
3	136.939	39.57	18.50	0.64	32.80	25.91	43.52	-17.61	HORIZONTAL	QP
4	194.453	37.87	15.87	0.78	32.80	21.72	43.52	-21.80	HORIZONTAL	QP
5	222.950	38.72	15.84	0.82	32.80	22.58	46.02	-23.44	HORIZONTAL	QP
6	323.320	40.05	19.90	1.00	32.80	28.15	46.02	-17.87	HORIZONTAL	QP

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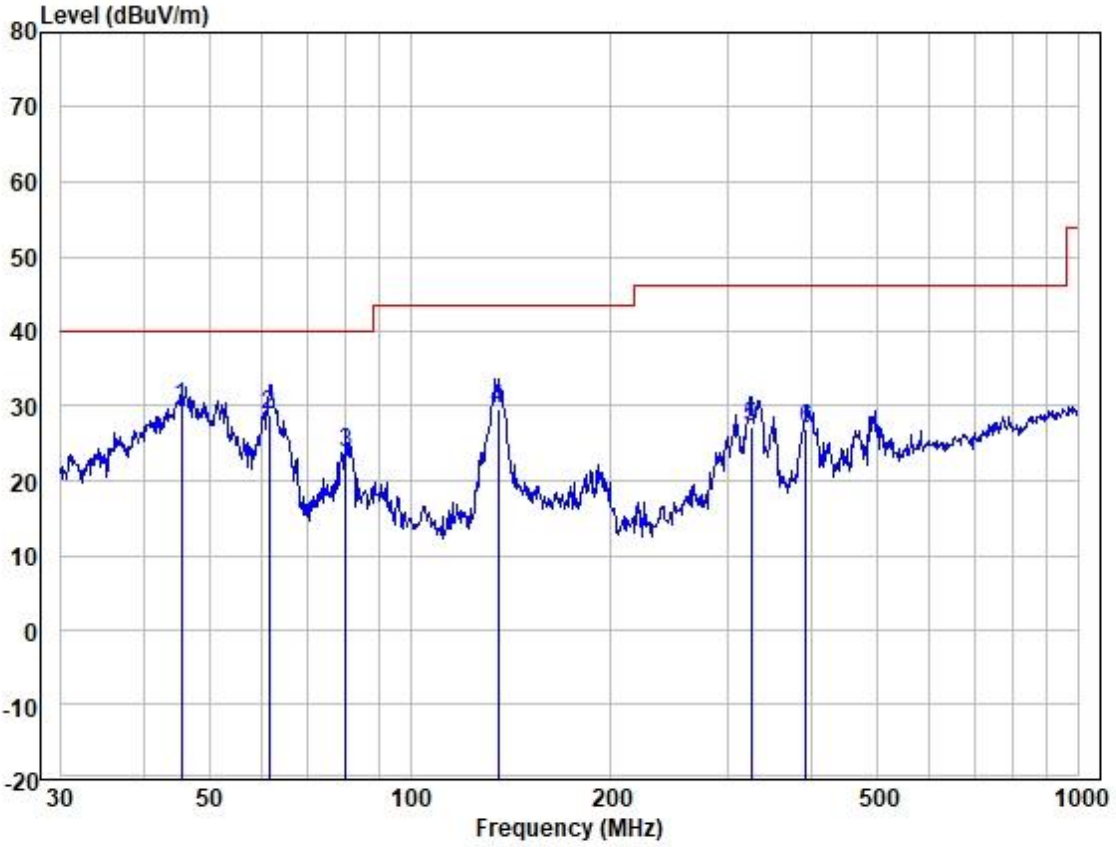
Test Mode: 03; Polarity: Vertical



Site : 966 Chamber
Job :
Model :
Power :
Test Mode : alta80

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	45.535	42.88	19.47	0.37	32.81	29.91	40.00	-10.09	VERTICAL	QP
2	61.562	42.61	18.47	0.42	32.80	28.70	40.00	-11.30	VERTICAL	QP
3	80.081	40.86	15.17	0.50	32.80	23.73	40.00	-16.27	VERTICAL	QP
4	135.506	43.35	18.46	0.63	32.80	29.64	43.52	-13.88	VERTICAL	QP
5	324.456	39.11	19.99	1.01	32.80	27.31	46.02	-18.71	VERTICAL	QP
6	392.095	37.11	21.39	1.15	32.80	26.85	46.02	-19.17	VERTICAL	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

Limit:

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

7.9.1 E.U.T. Operation

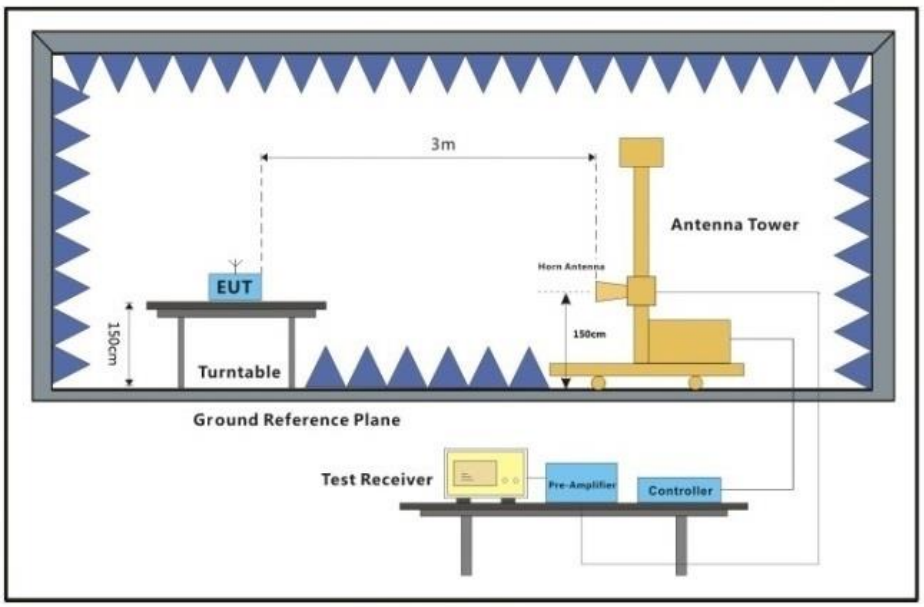
Operating Environment:

Temperature: 21.3 °C Humidity: 62.5 % RH Atmospheric Pressure: 1014 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA50 and Powered Supply by AC/DC ADAPTER).
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation(model ALTA80 and Powered Supply by AC/DC ADAPTER).

7.9.3 Test Setup Diagram



Above 1GHz

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.

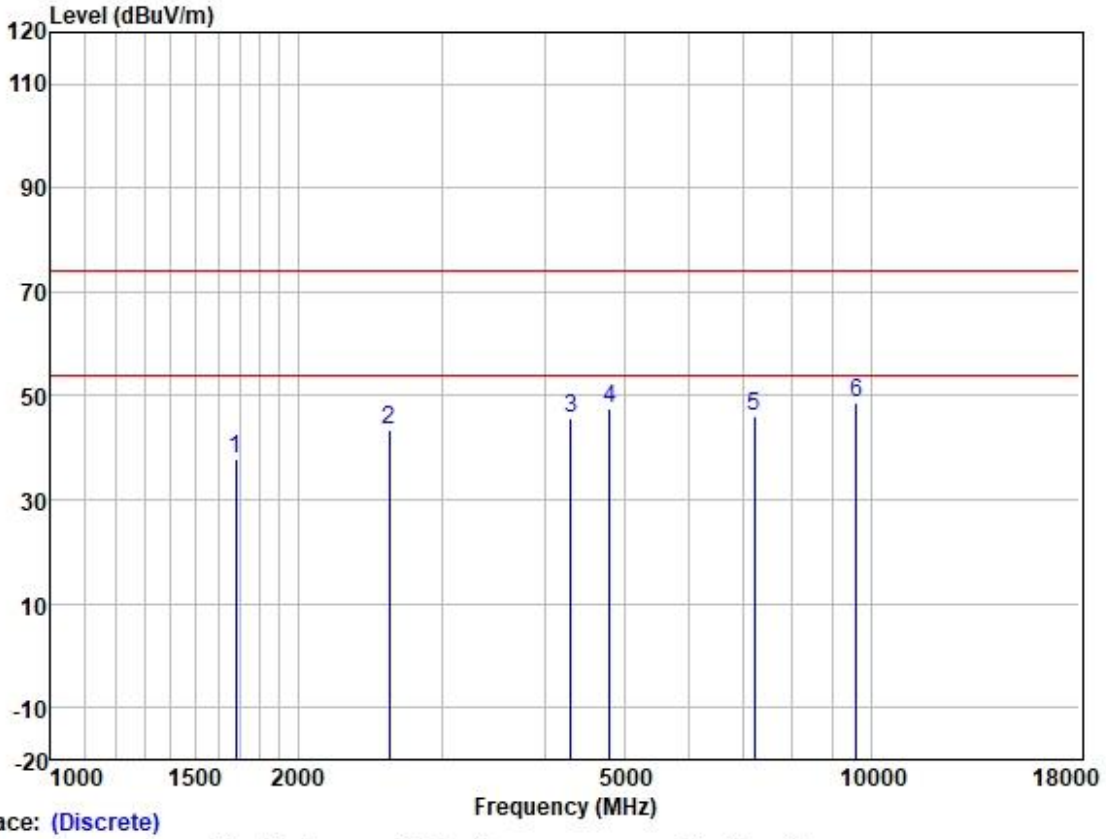
Remark:

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.

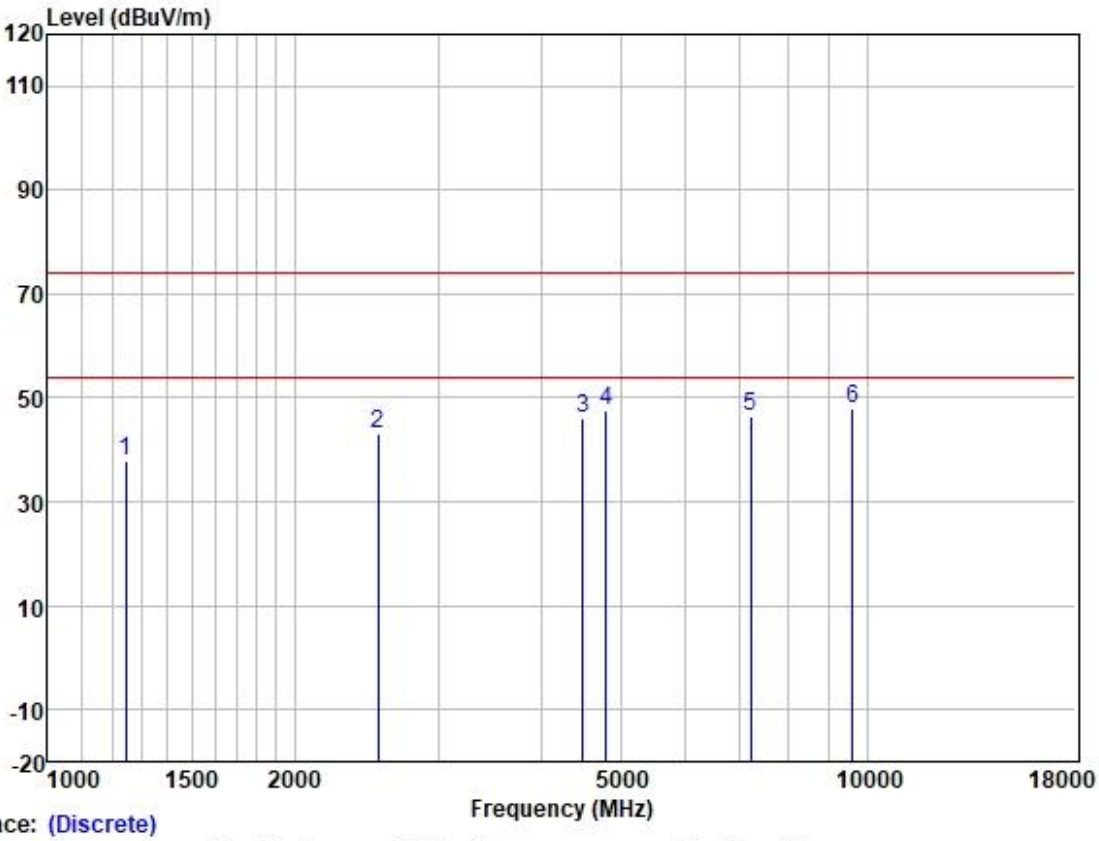
Test Mode: 00; Polarity: Vertical; Channel: Low



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1682.477	47.21	25.03	3.06	37.40	37.90	74.00	-36.10	VERTICAL	peak
2	2588.122	48.86	27.97	3.89	37.16	43.56	74.00	-30.44	VERTICAL	peak
3	4304.400	44.42	33.05	4.81	36.62	45.66	74.00	-28.34	VERTICAL	peak
4	4804.000	44.74	34.16	5.15	36.66	47.39	74.00	-26.61	VERTICAL	peak
5	7206.000	40.43	35.63	6.96	36.93	46.09	74.00	-27.91	VERTICAL	peak
6	9608.000	39.02	38.68	7.65	36.82	48.53	74.00	-25.47	VERTICAL	peak

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



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1245.663	49.00	23.65	2.70	37.63	37.72	74.00	-36.28	HORIZONTAL	peak
2	2528.963	48.39	27.90	3.85	37.18	42.96	74.00	-31.04	HORIZONTAL	peak
3	4495.125	43.87	34.17	4.78	36.63	46.19	74.00	-27.81	HORIZONTAL	peak
4	4804.000	44.77	34.16	5.15	36.66	47.42	74.00	-26.58	HORIZONTAL	peak
5	7206.000	40.82	35.63	6.96	36.93	46.48	74.00	-27.52	HORIZONTAL	peak
6	9608.000	38.45	38.68	7.65	36.82	47.96	74.00	-26.04	HORIZONTAL	peak

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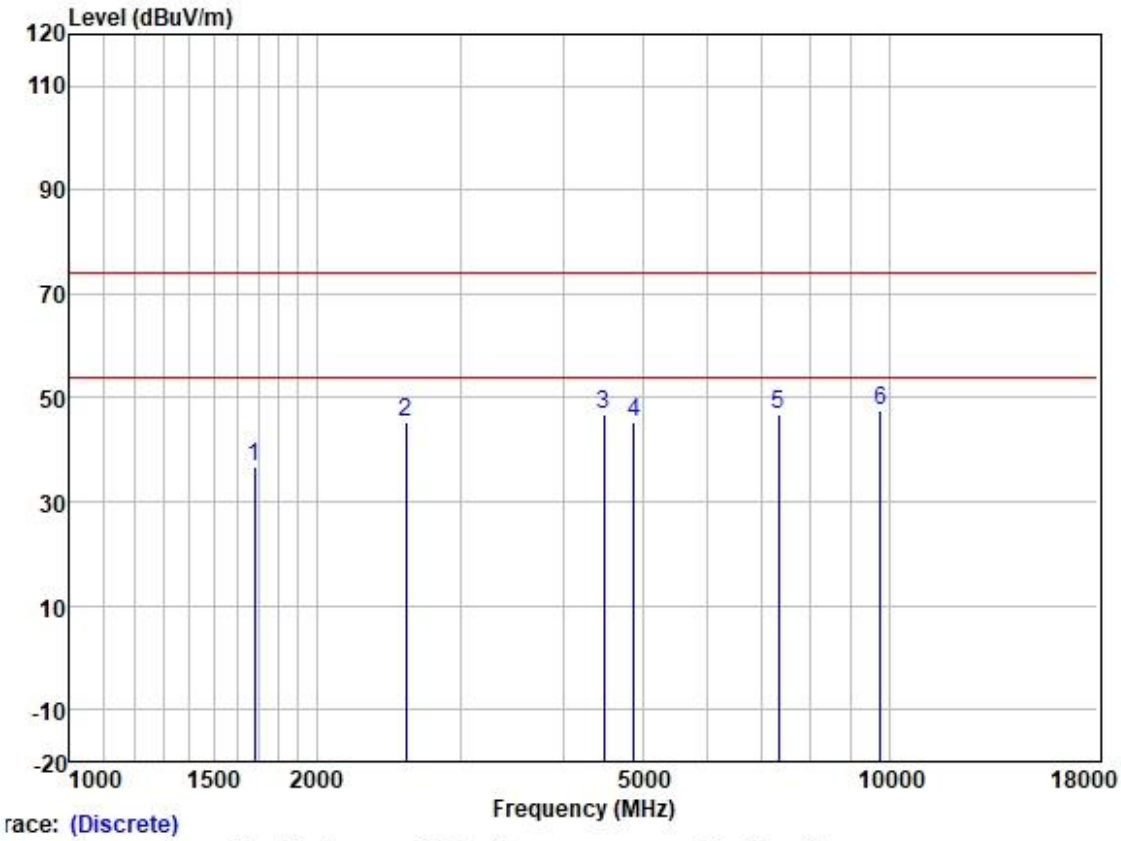
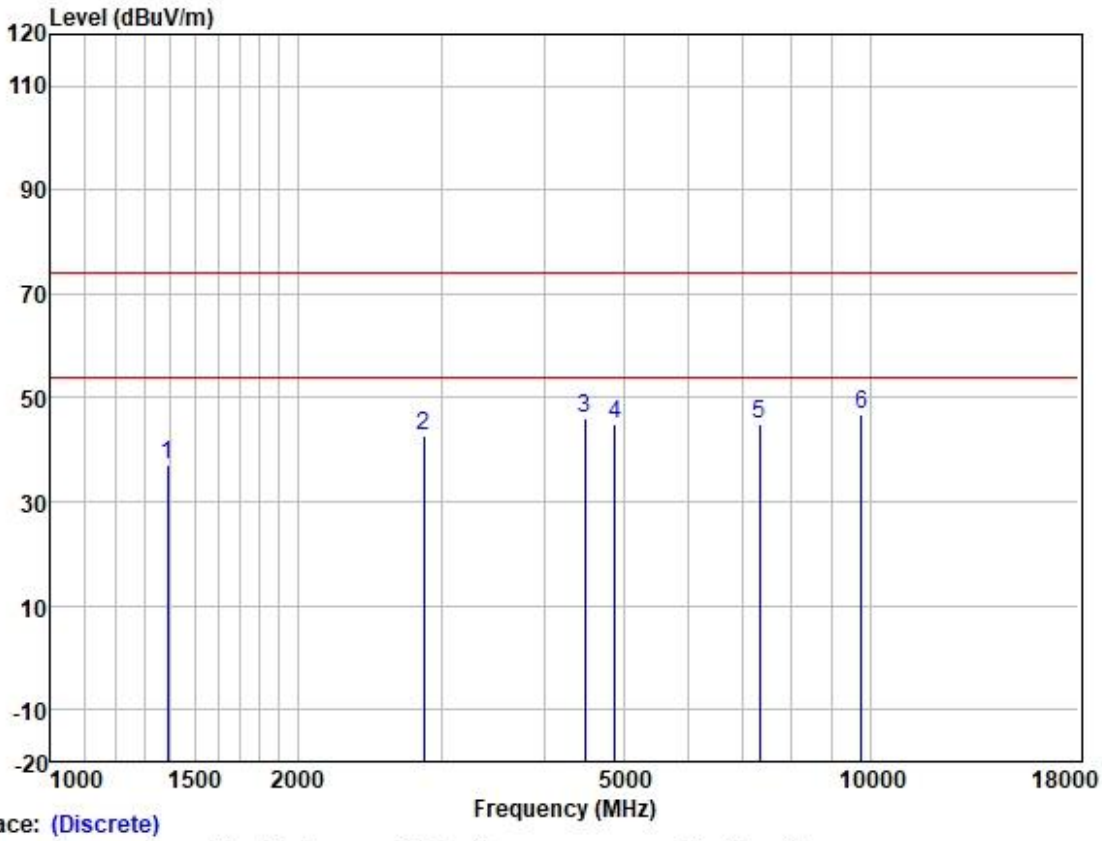
Test Mode: 00; Polarity: Vertical; Channel: Middle



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1682.477	46.21	25.03	3.06	37.40	36.90	74.00	-37.10	VERTICAL	peak
2	2573.203	50.66	27.95	3.88	37.16	45.33	74.00	-28.67	VERTICAL	peak
3	4482.150	44.53	34.12	4.78	36.63	46.80	74.00	-27.20	VERTICAL	peak
4	4880.000	42.51	34.15	5.22	36.67	45.21	74.00	-28.79	VERTICAL	peak
5	7320.000	40.71	36.07	6.81	36.95	46.64	74.00	-27.36	VERTICAL	peak
6	9760.000	37.99	38.81	7.65	36.81	47.64	74.00	-26.36	VERTICAL	peak

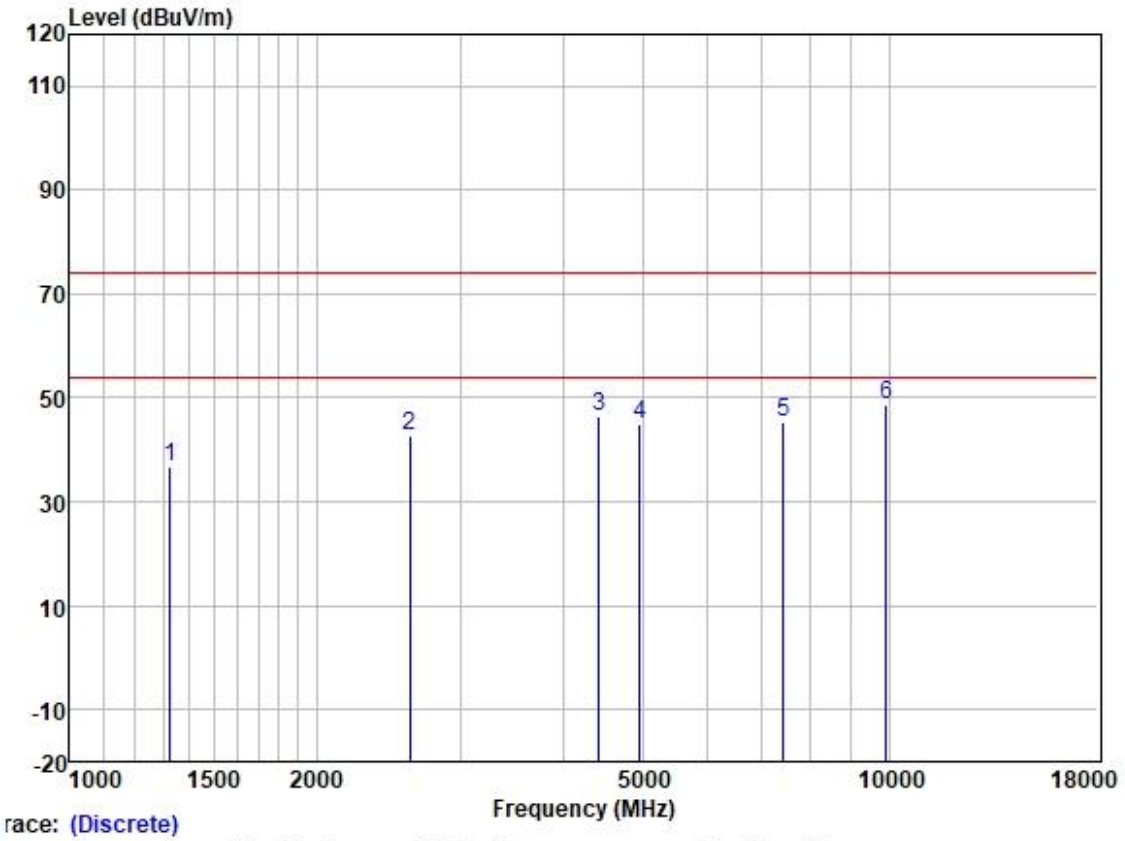
Test Mode: 00; Polarity: Horizontal; Channel: Middle



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1390.276	47.46	24.24	2.88	37.57	37.01	74.00	-36.99	HORIZONTAL	peak
2	2855.380	46.96	28.53	4.21	37.04	42.66	74.00	-31.34	HORIZONTAL	peak
3	4482.150	43.94	34.12	4.78	36.63	46.21	74.00	-27.79	HORIZONTAL	peak
4	4880.000	42.24	34.15	5.22	36.67	44.94	74.00	-29.06	HORIZONTAL	peak
5	7320.000	39.13	36.07	6.81	36.95	45.06	74.00	-28.94	HORIZONTAL	peak
6	9760.000	37.17	38.81	7.65	36.81	46.82	74.00	-27.18	HORIZONTAL	peak

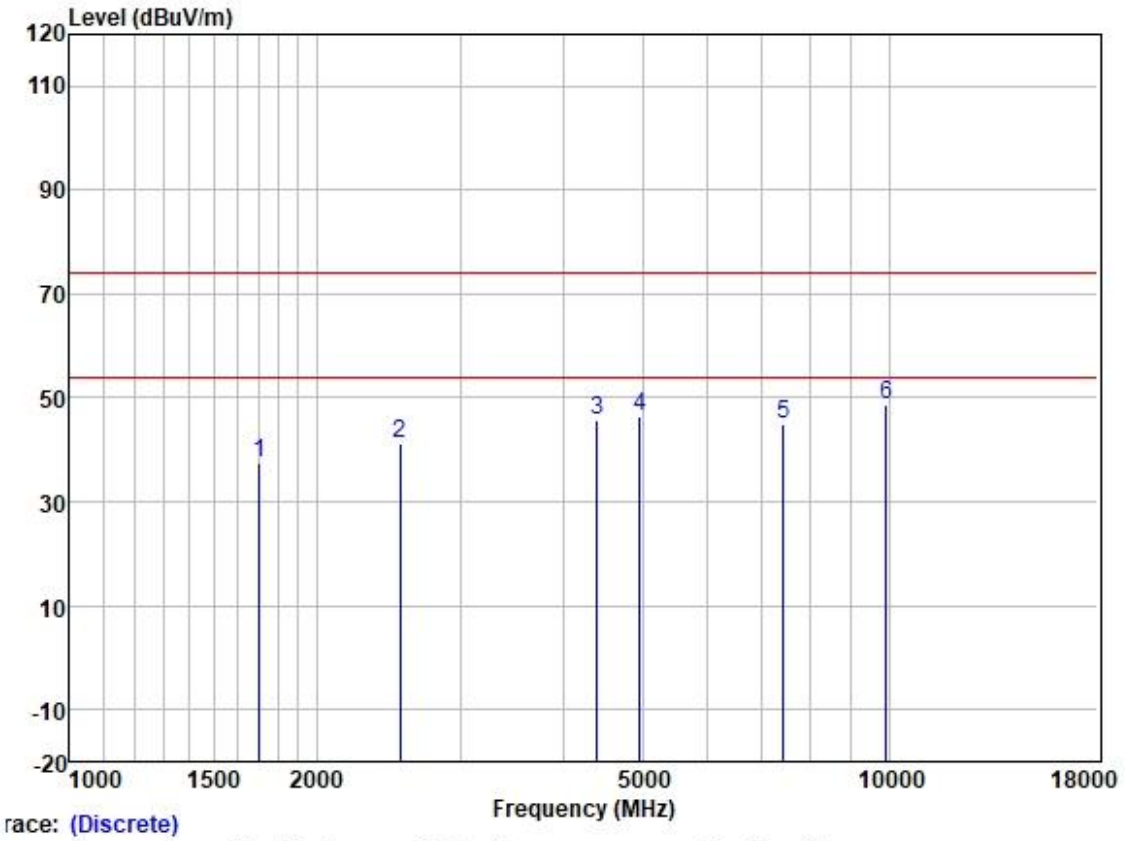
Test Mode: 00; Polarity: Vertical; Channel: High



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1327.446	47.49	24.07	2.83	37.60	36.79	74.00	-37.21	VERTICAL	peak
2	2603.126	48.15	27.99	3.90	37.15	42.89	74.00	-31.11	VERTICAL	peak
3	4430.628	44.40	33.87	4.79	36.63	46.43	74.00	-27.57	VERTICAL	peak
4	4960.000	42.37	34.15	5.28	36.69	45.11	74.00	-28.89	VERTICAL	peak
5	7440.000	39.23	36.33	6.72	36.96	45.32	74.00	-28.68	VERTICAL	peak
6	9920.000	38.79	38.95	7.67	36.80	48.61	74.00	-25.39	VERTICAL	peak

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



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1702.042	46.81	25.15	3.09	37.39	37.66	74.00	-36.34	HORIZONTAL	peak
2	2528.963	46.57	27.90	3.85	37.18	41.14	74.00	-32.86	HORIZONTAL	peak
3	4405.090	43.88	33.74	4.79	36.62	45.79	74.00	-28.21	HORIZONTAL	peak
4	4960.000	43.80	34.15	5.28	36.69	46.54	74.00	-27.46	HORIZONTAL	peak
5	7440.000	38.71	36.33	6.72	36.96	44.80	74.00	-29.20	HORIZONTAL	peak
6	9920.000	38.93	38.95	7.67	36.80	48.75	74.00	-25.25	HORIZONTAL	peak

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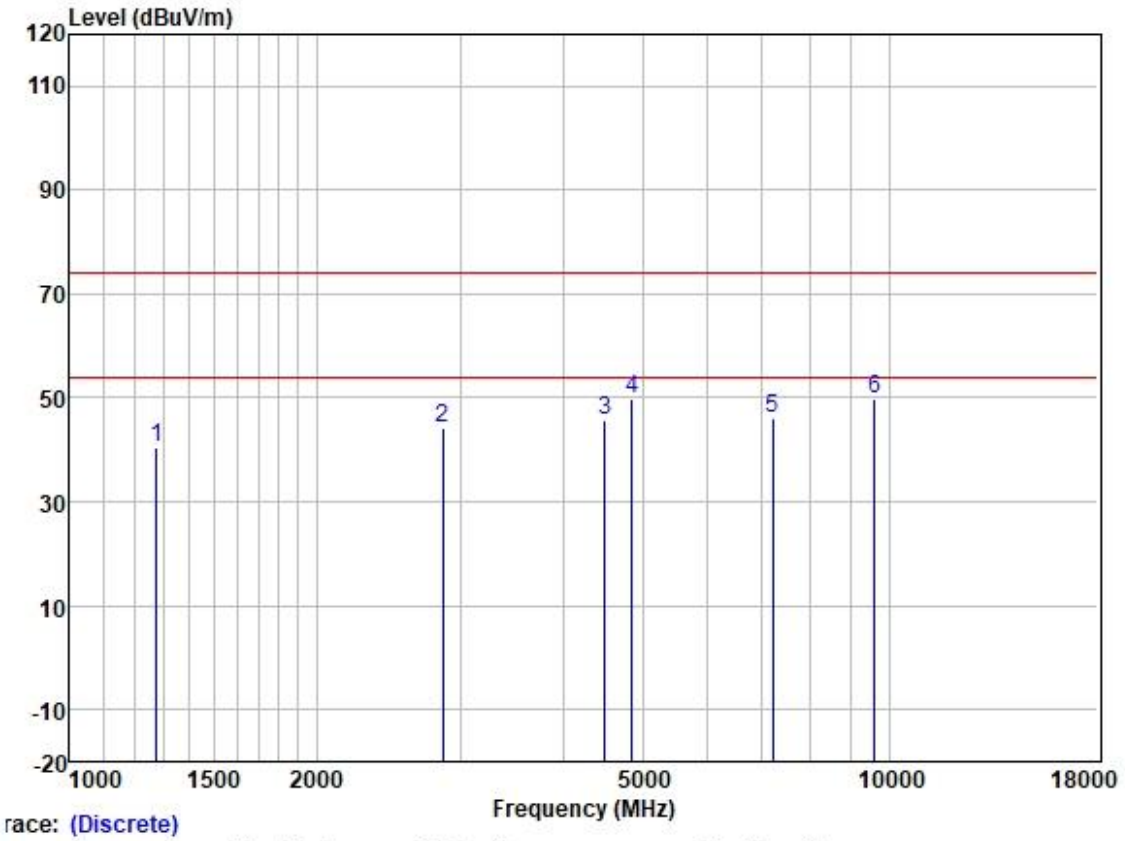
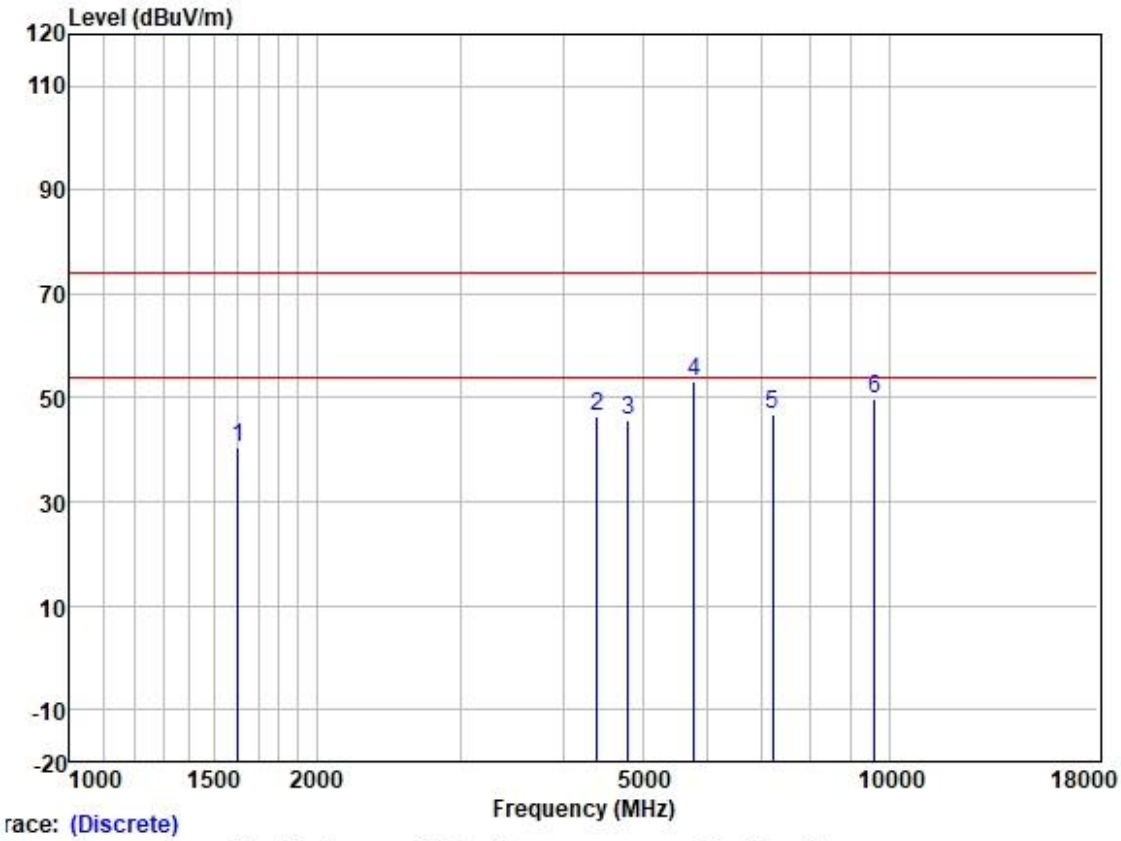
Test Mode: 03; Polarity: Vertical; Channel: Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1274.802	51.50	23.85	2.76	37.62	40.49	74.00	-33.51	VERTICAL	peak
2	2855.380	48.37	28.53	4.21	37.04	44.07	74.00	-29.93	VERTICAL	peak
3	4495.125	43.39	34.17	4.78	36.63	45.71	74.00	-28.29	VERTICAL	peak
4	4859.975	47.04	34.15	5.20	36.67	49.72	74.00	-24.28	VERTICAL	Peak
5	7206.000	40.39	35.63	6.96	36.93	46.05	74.00	-27.95	VERTICAL	peak
6	9608.000	40.25	38.68	7.65	36.82	49.76	74.00	-24.24	VERTICAL	peak

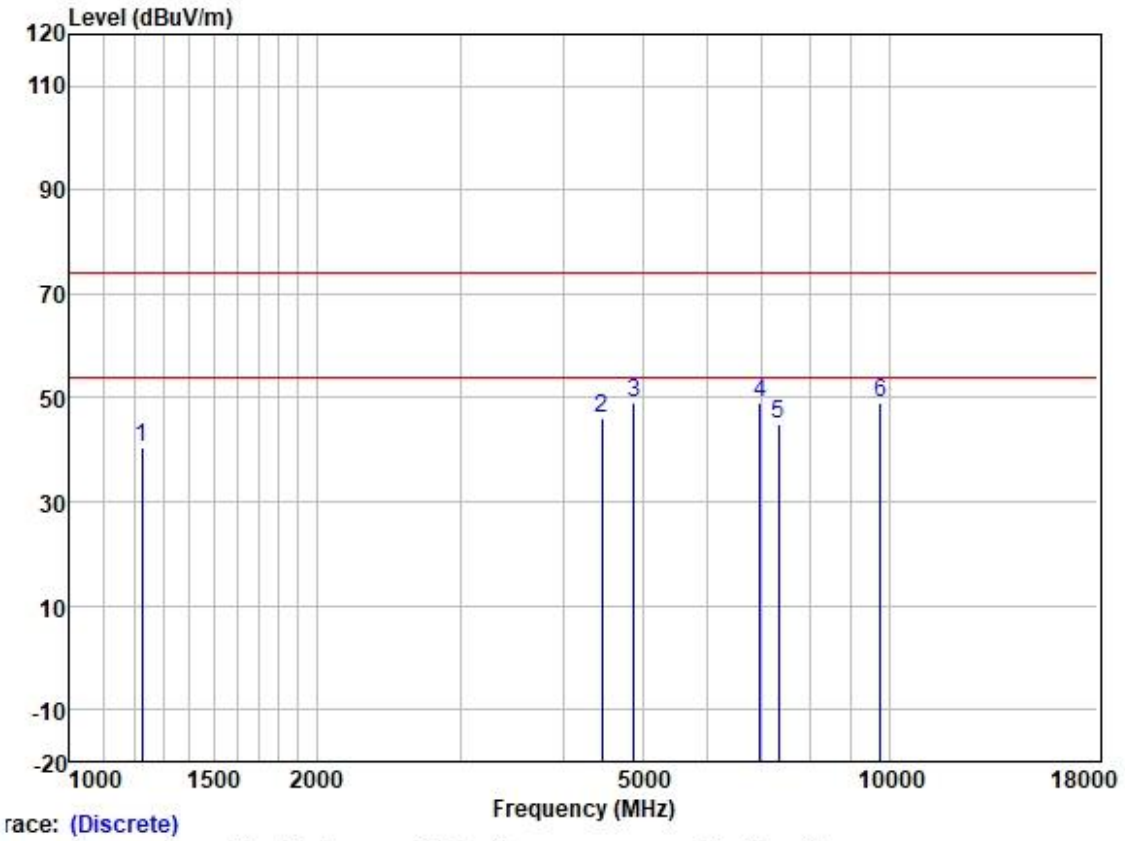
Test Mode: 03; Polarity: Horizontal; Channel: Low



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1606.441	50.19	24.71	3.00	37.44	40.46	74.00	-33.54	HORIZONTAL	peak
2	4405.090	44.61	33.74	4.79	36.62	46.52	74.00	-27.48	HORIZONTAL	peak
3	4804.000	43.02	34.16	5.15	36.66	45.67	74.00	-28.33	HORIZONTAL	peak
4	5780.300	51.71	32.66	5.76	36.79	53.34	74.00	-20.66	HORIZONTAL	peak
5	7206.000	40.99	35.63	6.96	36.93	46.65	74.00	-27.35	HORIZONTAL	peak
6	9608.000	40.14	38.68	7.65	36.82	49.65	74.00	-24.35	HORIZONTAL	peak

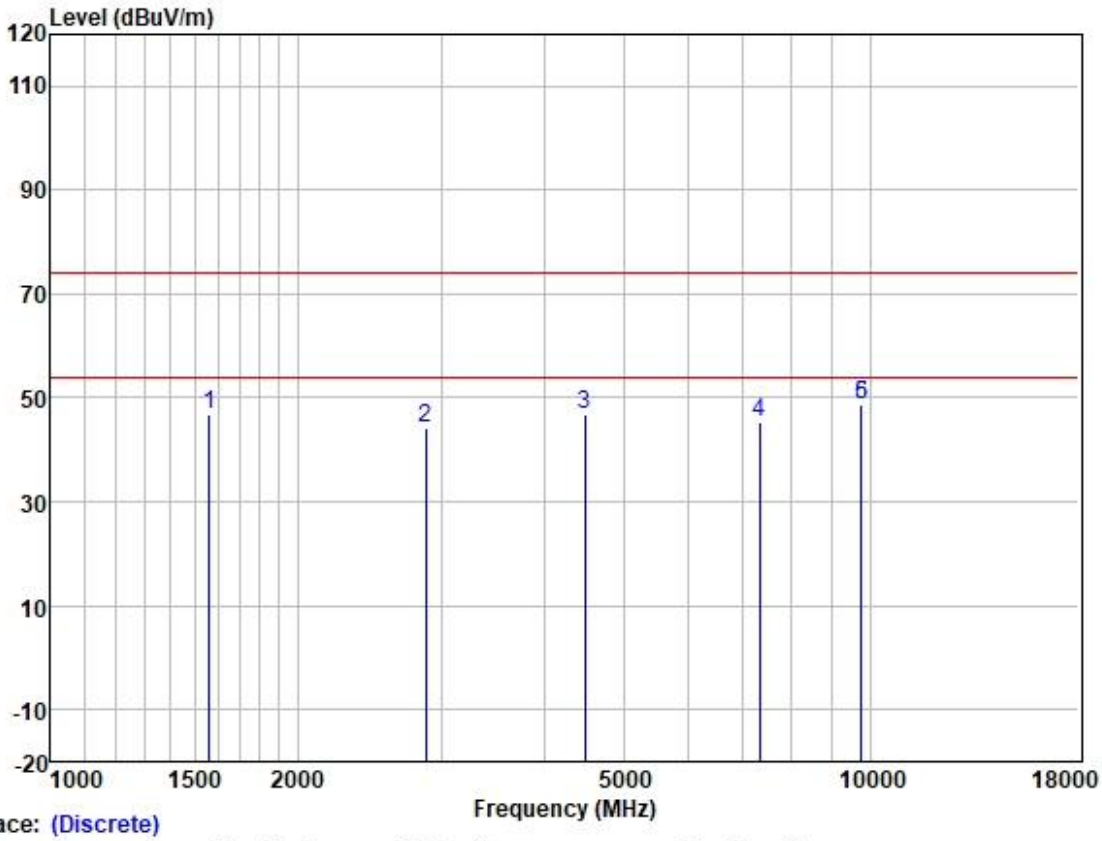
Test Mode: 03; Polarity: Vertical; Channel: Middle



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1224.247	52.09	23.42	2.63	37.64	40.50	74.00	-33.50	VERTICAL	peak
2	4456.315	43.97	34.00	4.79	36.63	46.13	74.00	-27.87	VERTICAL	peak
3	4880.000	46.20	34.15	5.22	36.67	48.90	74.00	-25.10	VERTICAL	peak
4	6954.852	43.81	35.04	7.10	36.89	49.06	74.00	-24.94	VERTICAL	peak
5	7320.000	38.99	36.07	6.81	36.95	44.92	74.00	-29.08	VERTICAL	peak
6	9760.000	39.25	38.81	7.65	36.81	48.90	74.00	-25.10	VERTICAL	peak

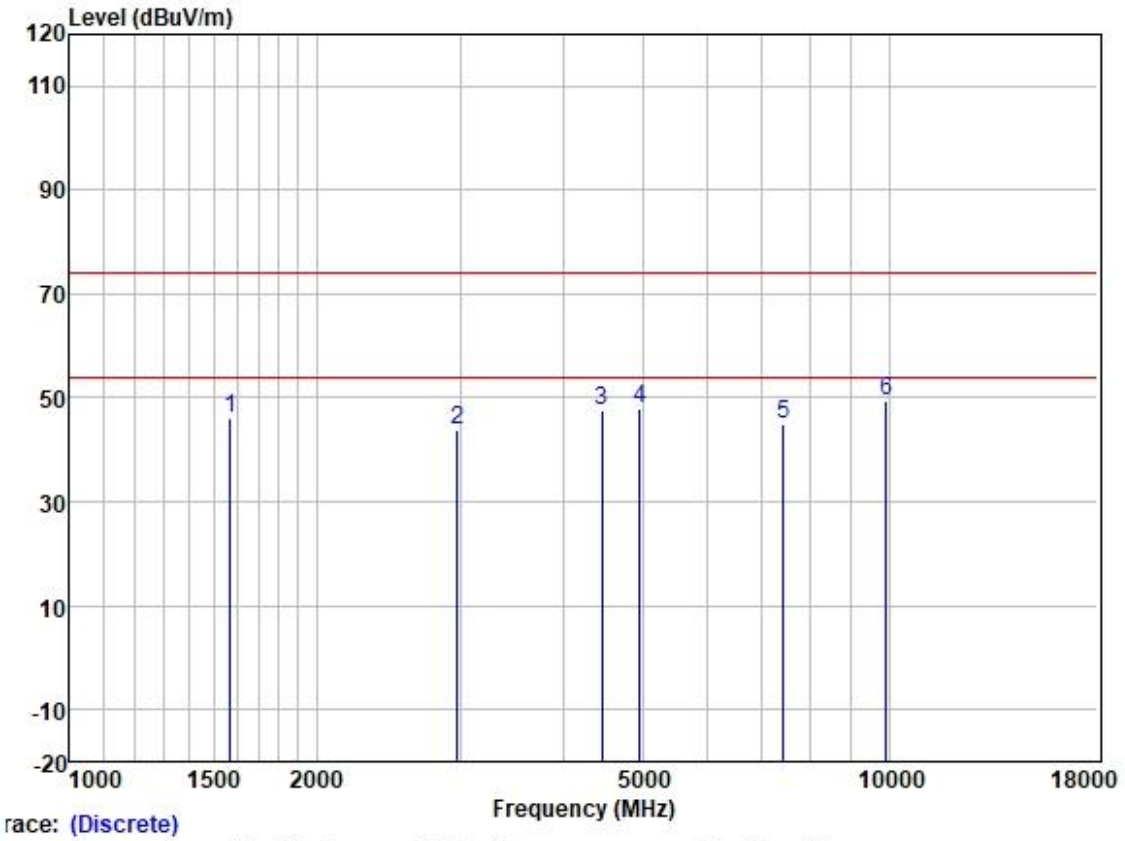
Test Mode: 03; Polarity: Horizontal; Channel: Middle



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1560.673	56.75	24.57	2.97	37.47	46.82	74.00	-27.18	HORIZONTAL	peak
2	2871.934	48.29	28.56	4.22	37.04	44.03	74.00	-29.97	HORIZONTAL	peak
3	4482.150	44.42	34.12	4.78	36.63	46.69	74.00	-27.31	HORIZONTAL	peak
4	7326.267	39.30	36.07	6.81	36.95	45.23	74.00	-28.77	HORIZONTAL	Peak
5	9753.371	39.02	38.81	7.65	36.81	48.67	74.00	-25.33	HORIZONTAL	Peak
6	9760.000	39.02	38.81	7.65	36.81	48.67	74.00	-25.33	HORIZONTAL	peak

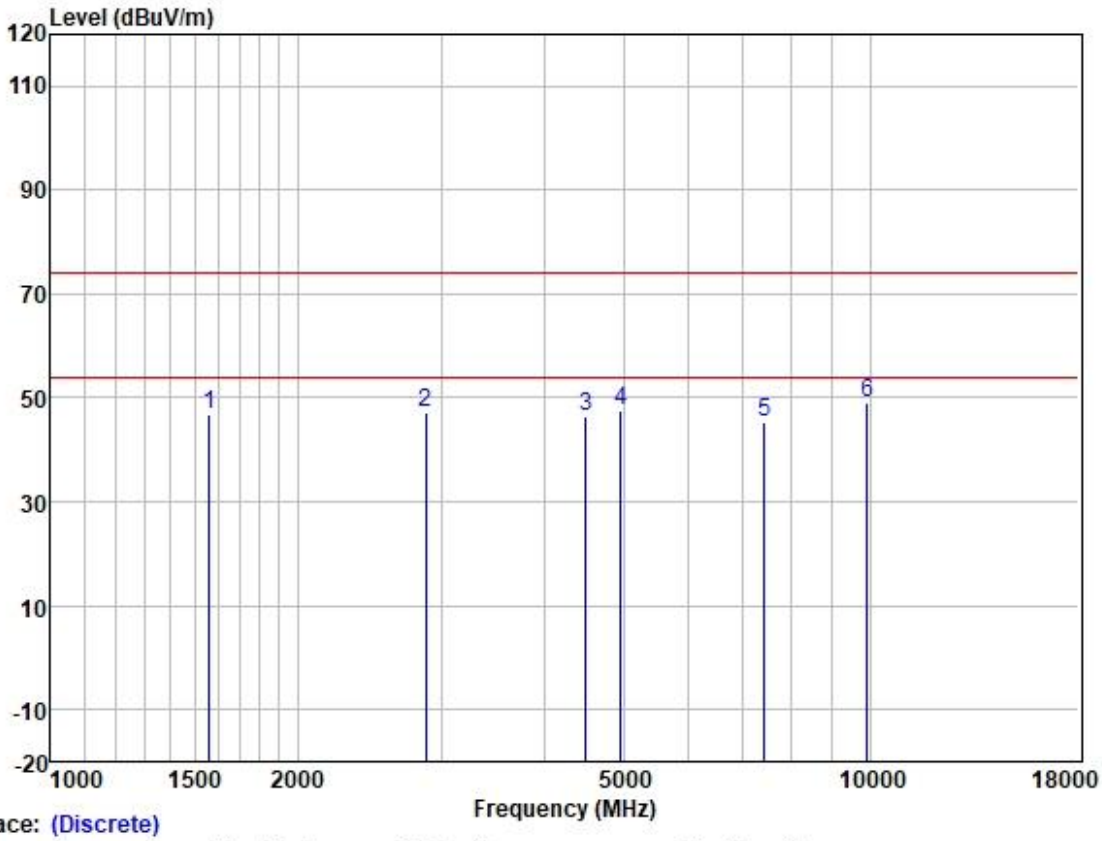
Test Mode: 03; Polarity: Vertical; Channel: High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1569.721	56.16	24.60	2.97	37.47	46.26	74.00	-27.74	VERTICAL	peak
2	2973.293	47.80	28.66	4.28	36.97	43.77	74.00	-30.23	VERTICAL	peak
3	4456.315	45.51	34.00	4.79	36.63	47.67	74.00	-26.33	VERTICAL	peak
4	4960.000	45.25	34.15	5.28	36.69	47.99	74.00	-26.01	VERTICAL	peak
5	7440.000	39.00	36.33	6.72	36.96	45.09	74.00	-28.91	VERTICAL	peak
6	9920.000	39.67	38.95	7.67	36.80	49.49	74.00	-24.51	VERTICAL	peak

Test Mode: 03; Polarity: Horizontal; Channel: High



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1560.673	56.75	24.57	2.97	37.47	46.82	74.00	-27.18	HORIZONTAL	peak
2	2871.934	51.50	28.56	4.22	37.04	47.24	74.00	-26.76	HORIZONTAL	peak
3	4495.125	44.19	34.17	4.78	36.63	46.51	74.00	-27.49	HORIZONTAL	peak
4	4960.000	44.65	34.15	5.28	36.69	47.39	74.00	-26.61	HORIZONTAL	peak
5	7440.000	39.27	36.33	6.72	36.96	45.36	74.00	-28.64	HORIZONTAL	peak
6	9920.000	39.12	38.95	7.67	36.80	48.94	74.00	-25.06	HORIZONTAL	peak

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZCR240100003702

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2401000037HS

10 Appendix

1. Duty Cycle

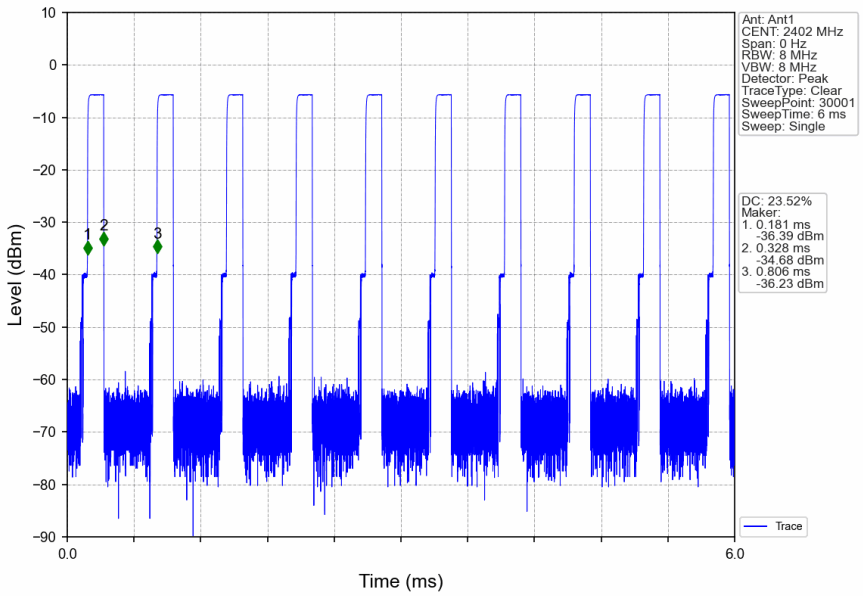
1.1 Ant1

1.1.1 Test Result

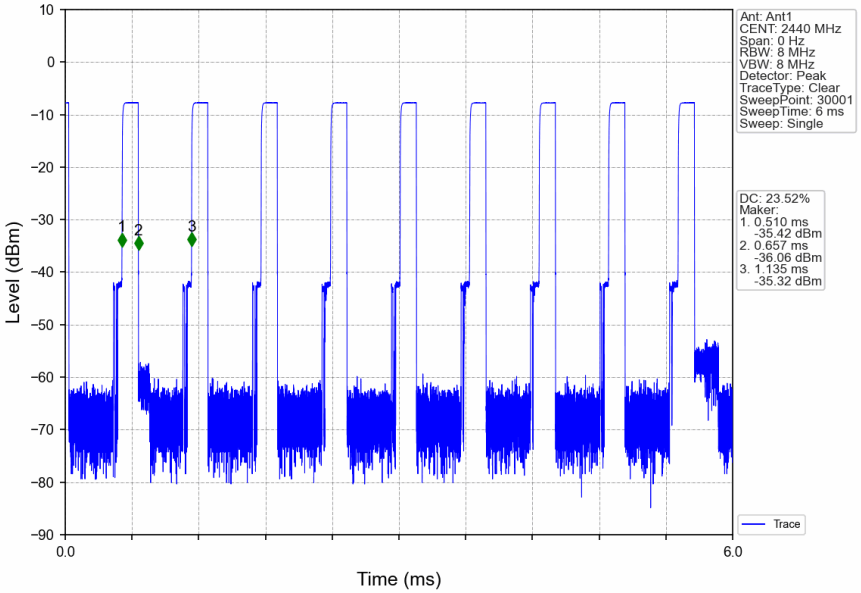
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	0.147	0.625	23.52	6.29	0.00
		2440	0.147	0.625	23.52	6.29	0.03
		2480	0.147	0.625	23.52	6.29	0.00

1.1.2 Test Graph

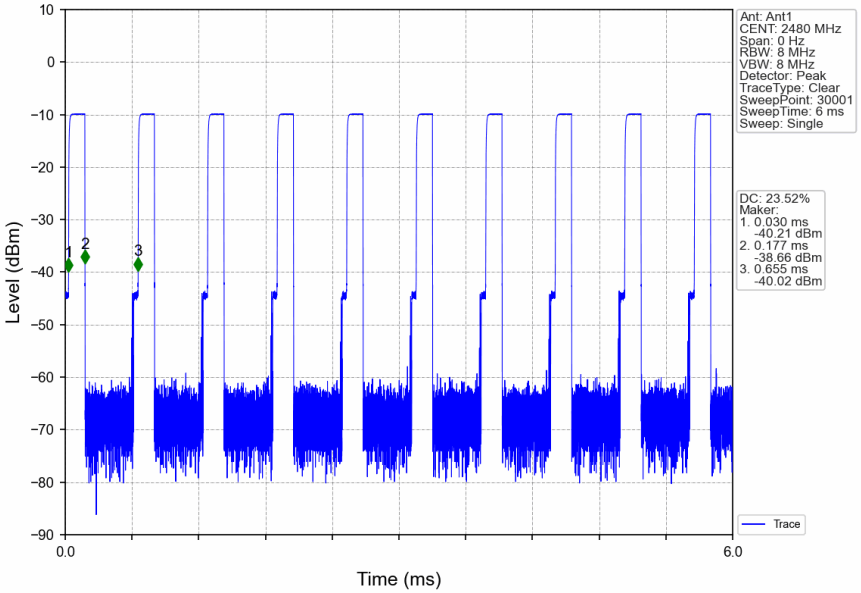
1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



2. Bandwidth

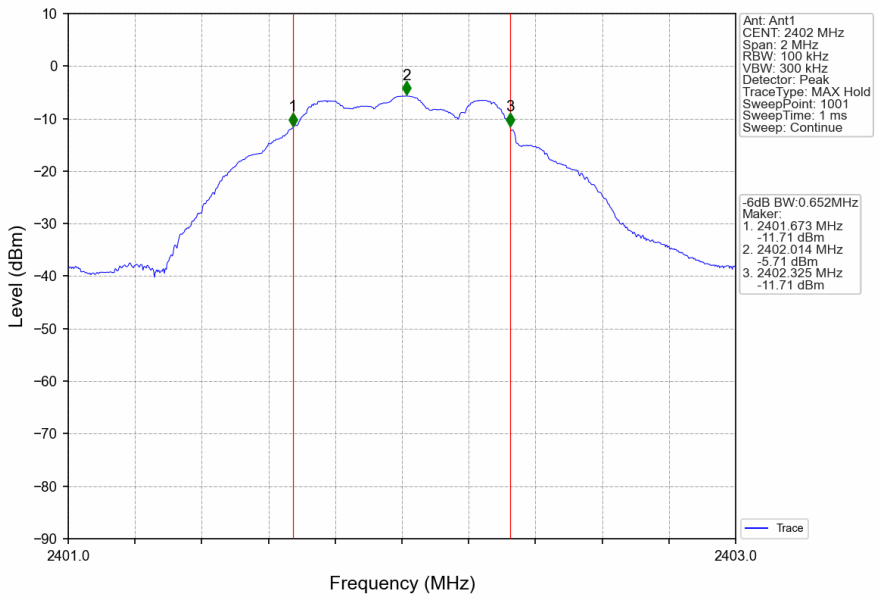
2.2 6dB BW

2.2.1 Test Result

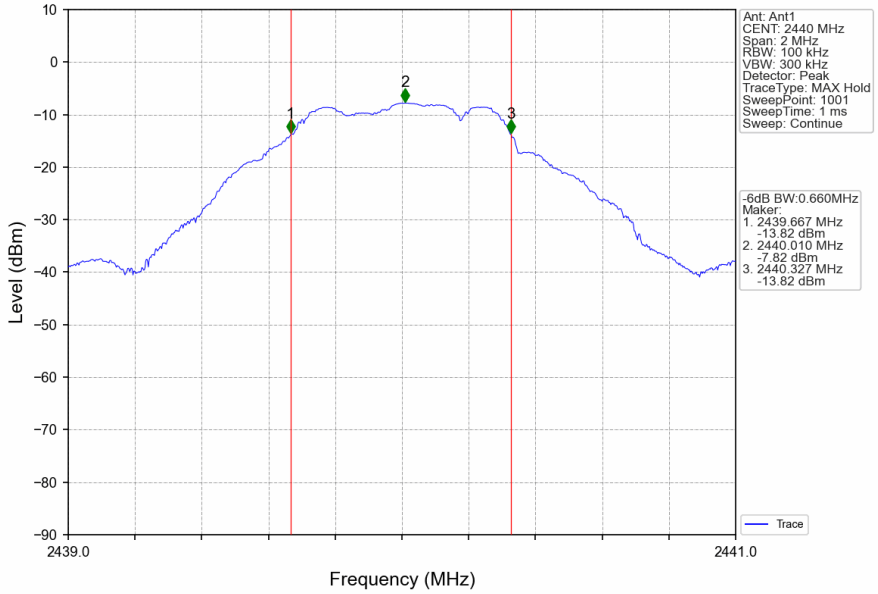
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.652	>=0.5	Pass
		2440	1	0.660	>=0.5	Pass
		2480	1	0.668	>=0.5	Pass

2.2.2 Test Graph

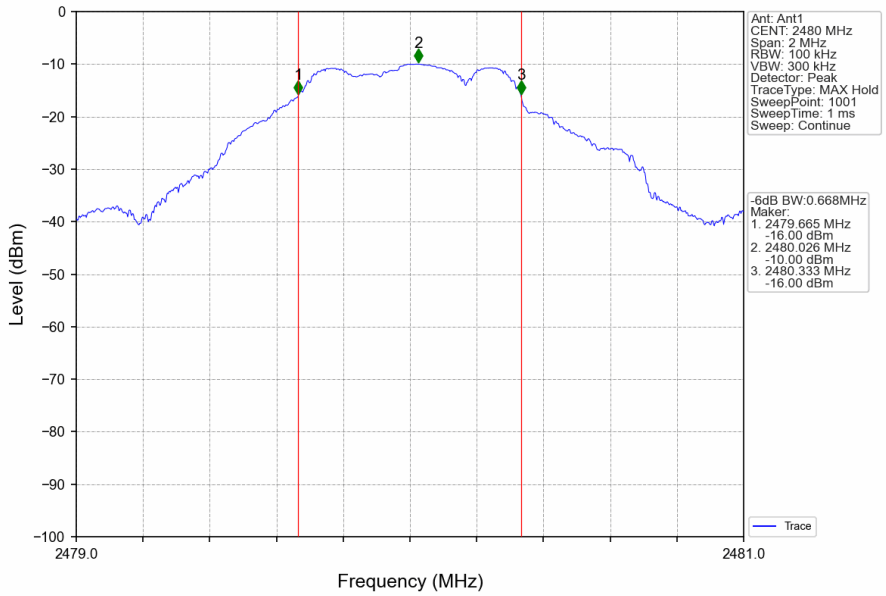
1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



3. Maximum Conducted Output Power

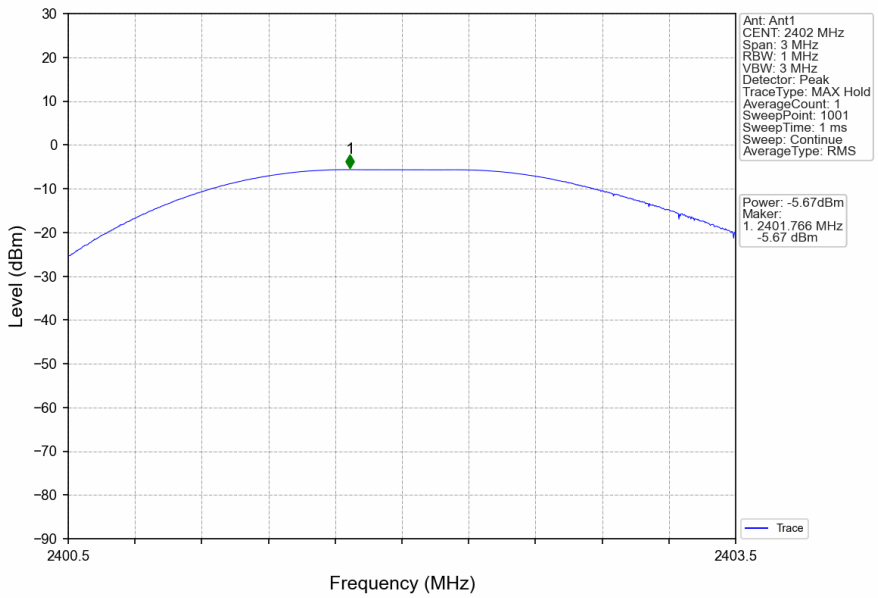
3.1 Power

3.1.1 Test Result

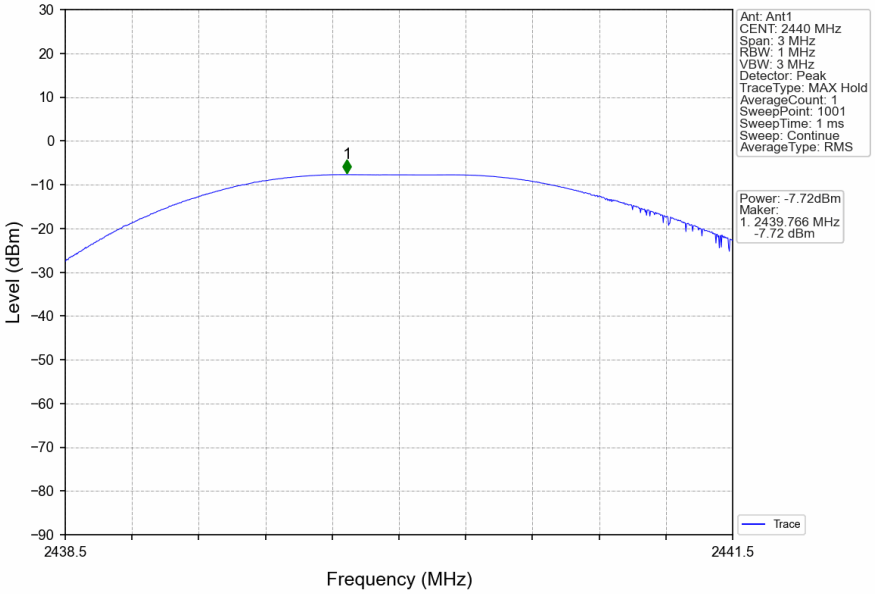
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	**-5.67**	<=30	Pass
		2440	-7.72	<=30	Pass
		2480	-9.89	<=30	Pass
Note1: Antenna Gain: Ant1: 1.68 dBi;					

3.1.2 Test Graph

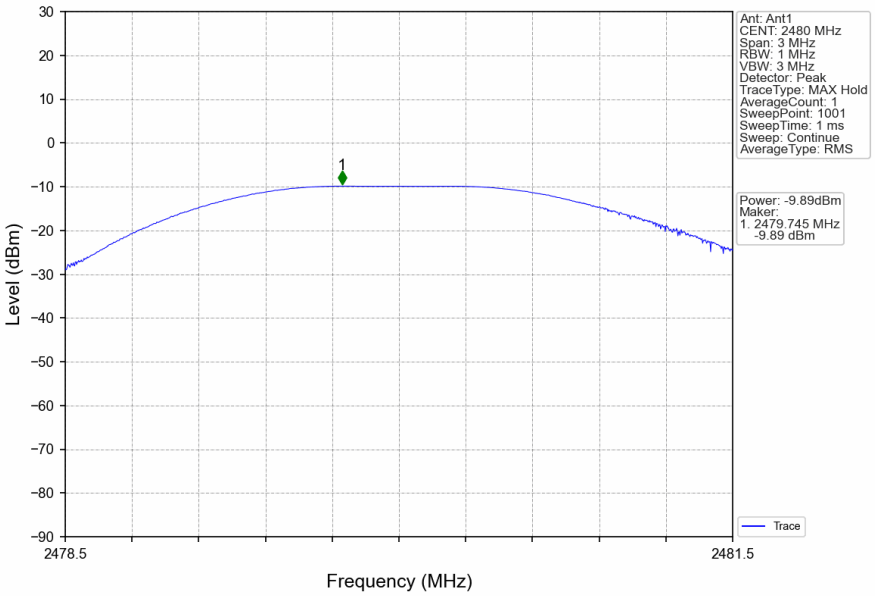
1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



4. Maximum Power Spectral Density

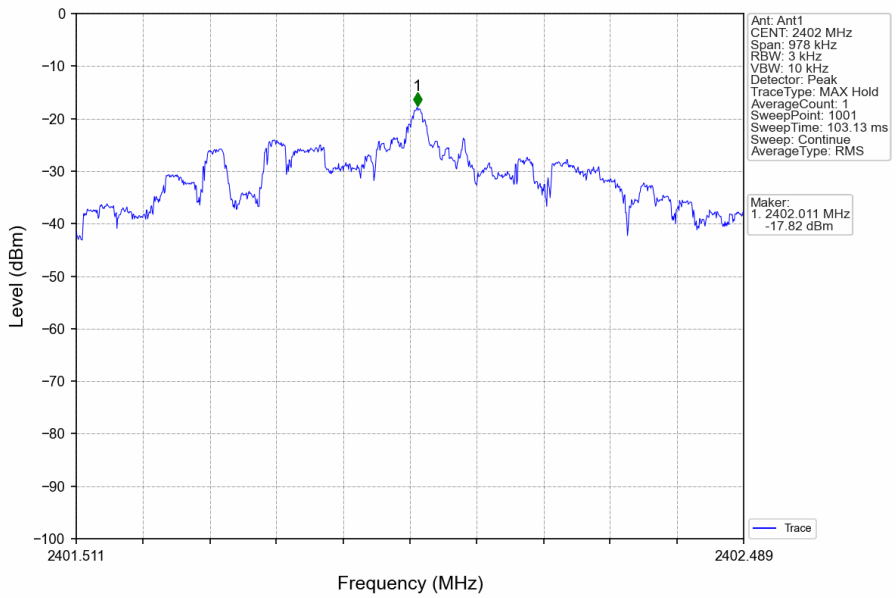
4.1 PSD

4.1.1 Test Result

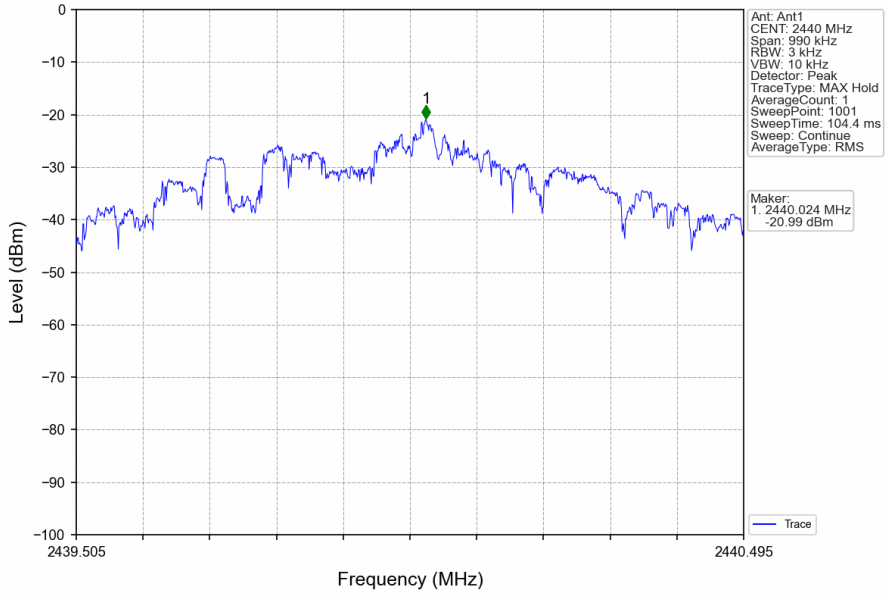
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-17.82	<=8	Pass
		2440	-20.99	<=8	Pass
		2480	-23.33	<=8	Pass
Note1: Antenna Gain: Ant1: 1.68 dBi;					

4.1.2 Test Graph

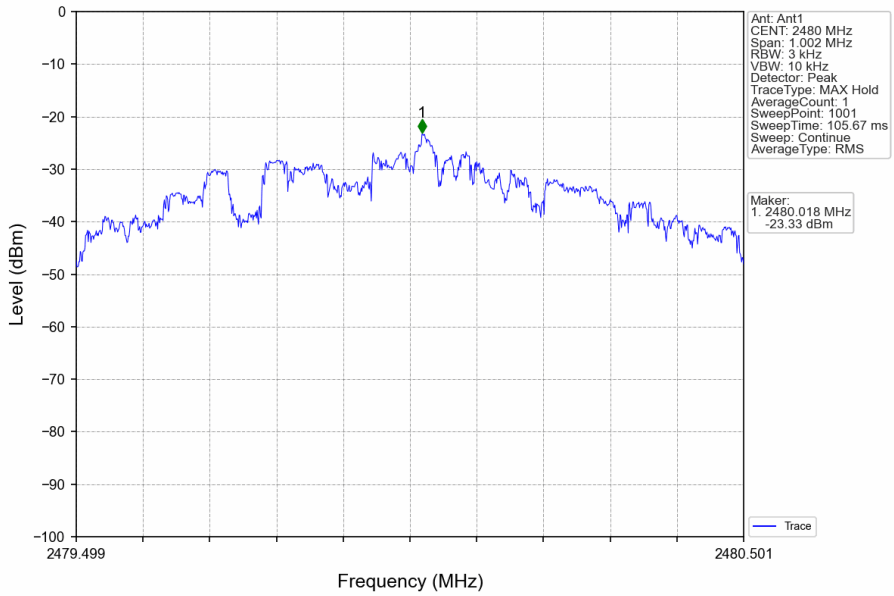
1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

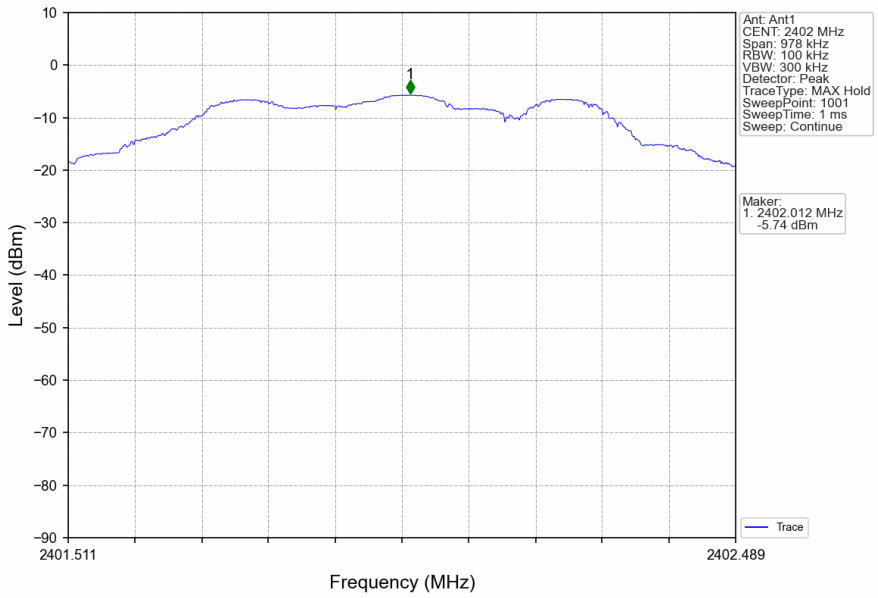
5.1 Ref

5.1.1 Test Result

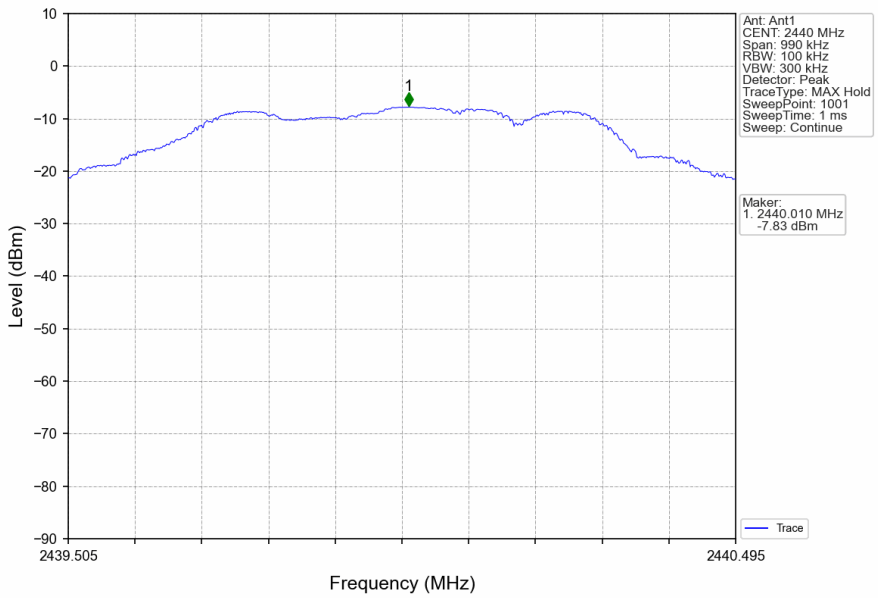
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
1M	SISO	2402	1	-5.74
		2440	1	-7.83
		2480	1	-10.02
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.				

5.1.2 Test Graph

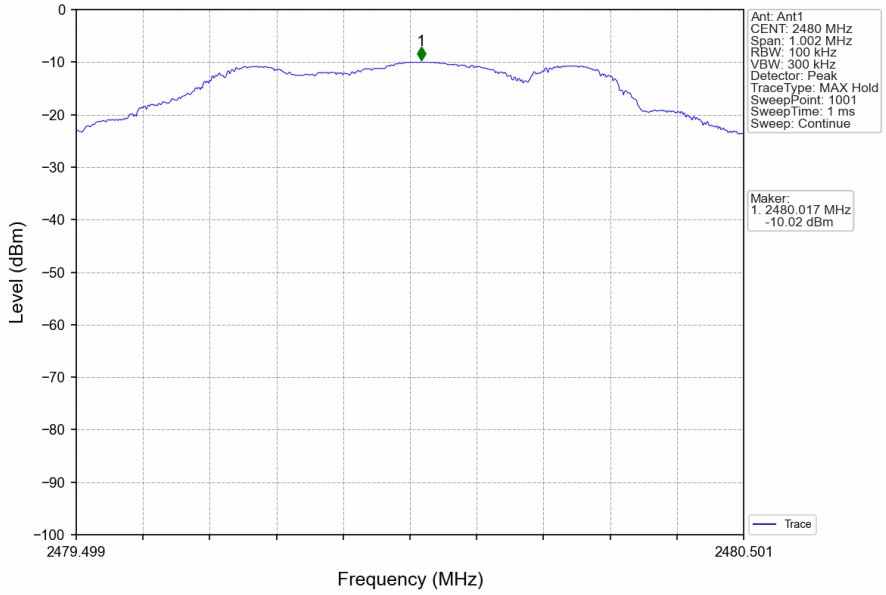
1M_LCH_2402MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



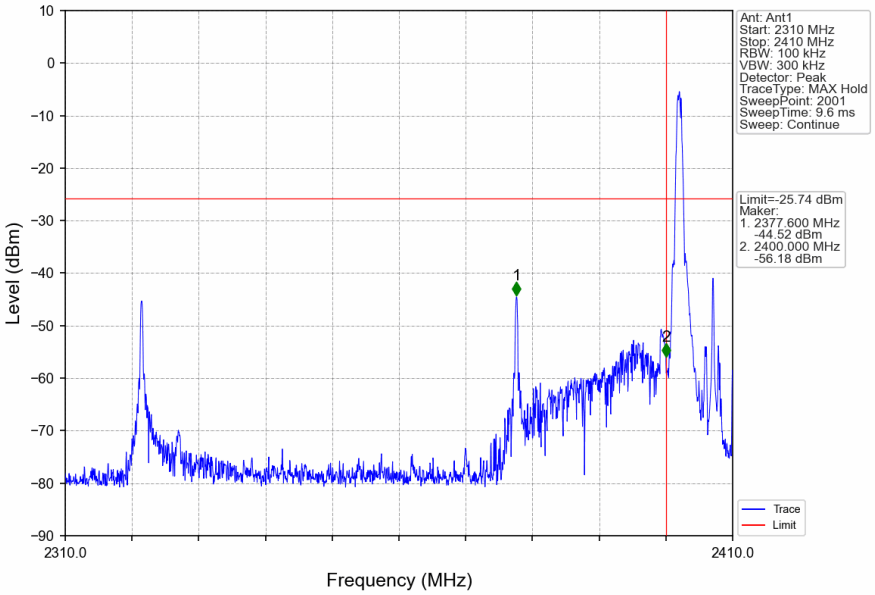
5.2 CSE and Band Edges

5.2.1 Test Result

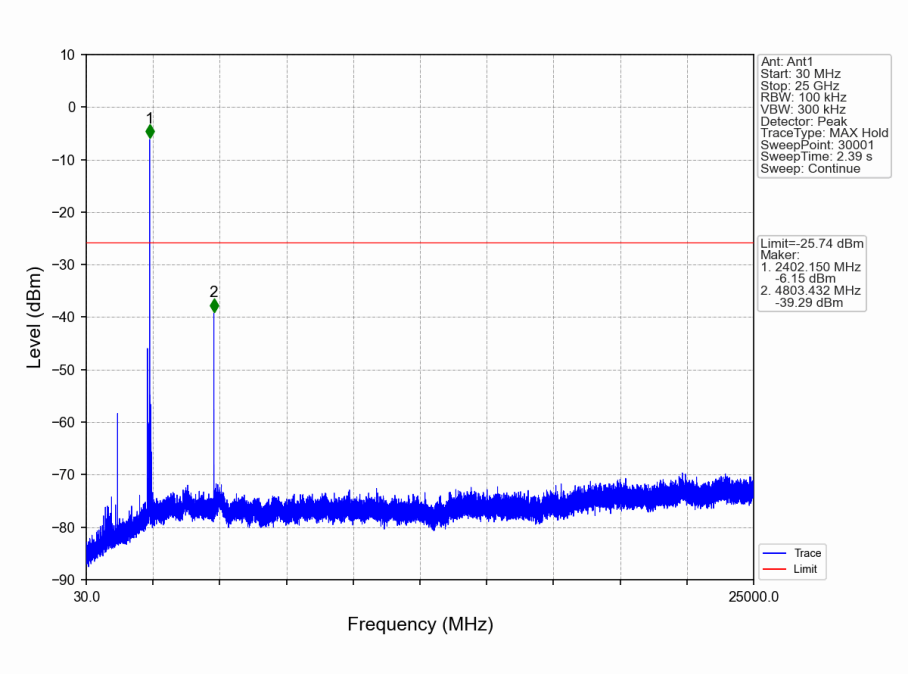
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	-5.74	-25.74	Pass
		2440	1	-5.74	-25.74	Pass
		2480	1	-5.74	-25.74	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.						

5.2.2 Test Graph

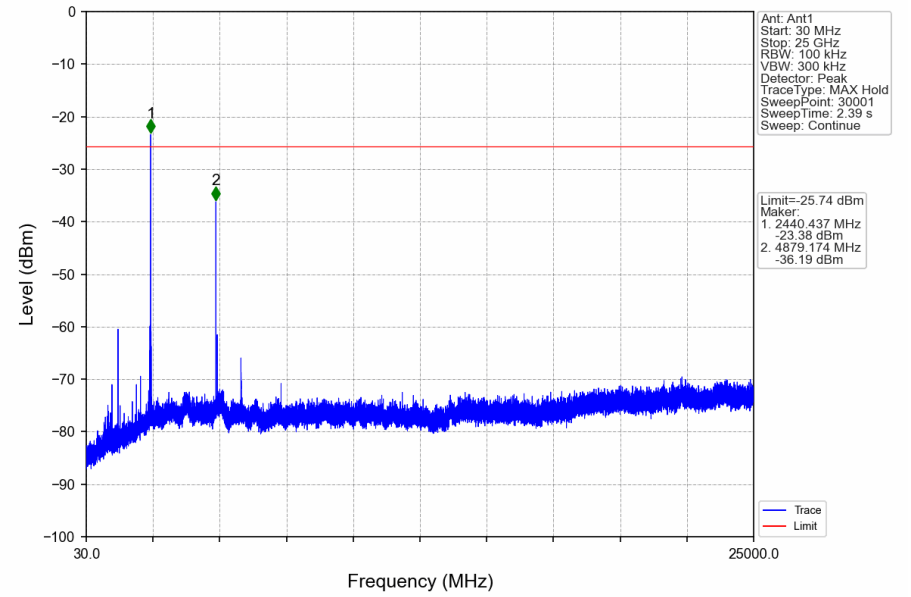
1M_LCH_2402MHz_Ant1_NTNV



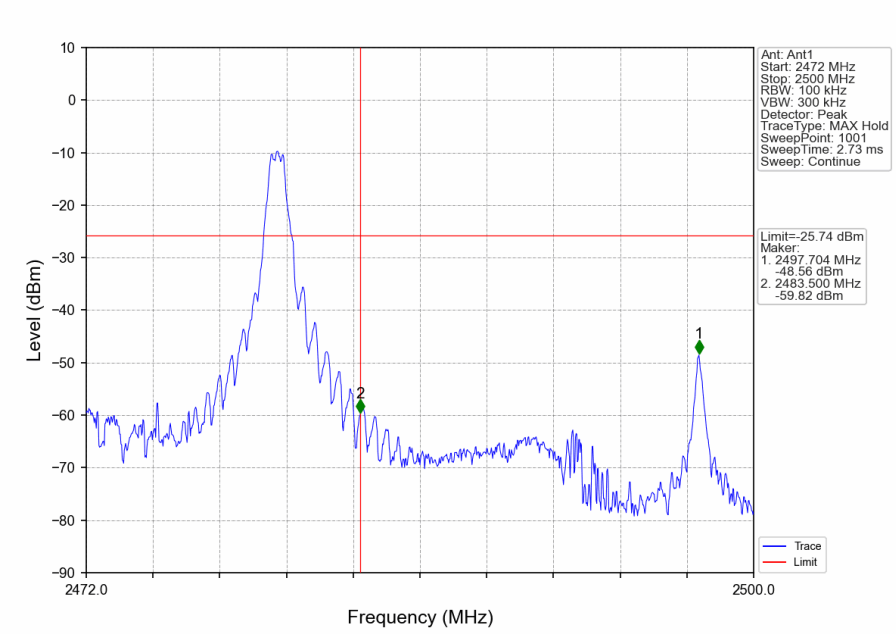
1M_LCH_2402MHz_Ant1_NTNV



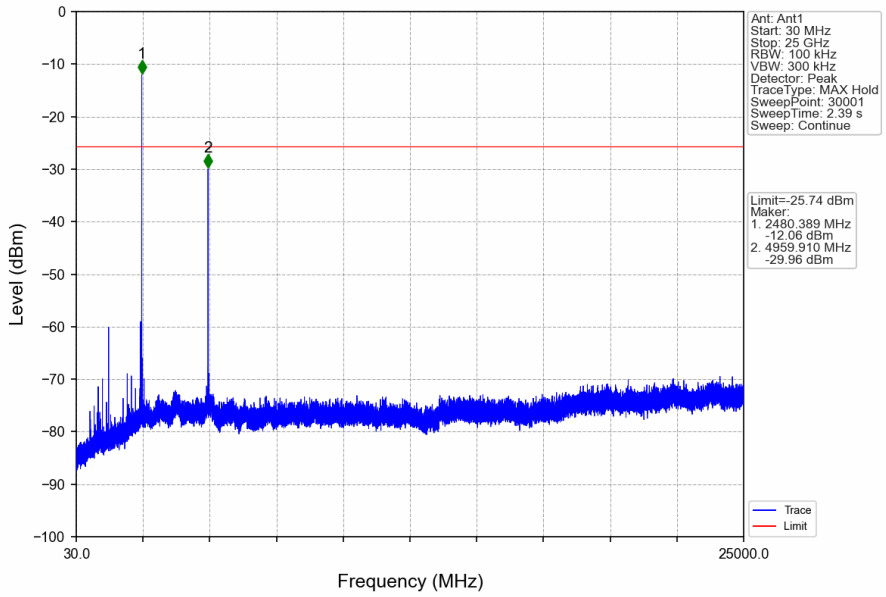
1M_MCH_2440MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



1M_HCH_2480MHz_Ant1_NTNV



- End of the Report -

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch, Testing Center EEC Laboratory.
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663 t (86-20) 82155555 www.sgsgroup.com.cn
中国・广东・广州高新技术产业开发区科学城科珠路198号 邮编：510663 t (86-20) 82155555 sgs.china@sgs.com
Member of the SGS Group (SGS SA)