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TEST REPORT

 Application No.:
 KSCR2411002264AT

 FCC ID:
 2BKBC-XFVI-D95

 IC:
 32848-XFVID95

Applicant: Hong Kong Future Intelligent Technology Co., Ltd

Address of Applicant: Room 1450 14/F, Eton Tower, 8 Hysan Avenue, Causeway Bay, Hong

Kong, China

Manufacturer: Hong Kong Future Intelligent Technology Co., Ltd

Address of Manufacturer: Room 1450 14/F, Eton Tower, 8 Hysan Avenue, Causeway Bay, Hong

Kong, China

Equipment Under Test (EUT):

EUT Name: viaim NoteKit

Model No.: XFVI-D95

Trade Mark: viaim

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

RSS-247 Issue 3, August 2023

RSS-Gen Issue 5 Amendment 2 (February 2021)

Date of Receipt: 2024-11-11

Date of Test: 2024-11-21 to 2024-12-10

Date of Issue: 2024-12-11

Test Result: Pass*

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

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



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	Revision Record		
Version	Description	Date	Remark
00	Original	2024-12-11	/

Authorized for issue by:		
Tested By	Ceril Lin	
	Eric Liu /Project Engineer	
Approved By	Terry Hon	
	Terry Hou /Reviewer	



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2 Test Summary

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

N/A: Not applicable

Radio Spectrum Matt	Radio Spectrum Matter Part				
Item	FCC Requirement	IC Requirement	Method	Result	
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207	RSS-Gen Clause 8.8	ANSI C63.10 (2013) Section 6.2	Pass	
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247a(2)	RSS-247 Clause 5.2(a)	ANSI C63.10 (2013) Section 11.8.1	Pass	
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247(b)(3)	RSS-247 Clause 5.4(d)	ANSI C63.10 (2013) Section 11.9.1	Pass	
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247(e)	RSS-247 Clause 5.2(b)	ANSI C63.10 (2013) Section 11.10.2	Pass	
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.13.3.2	Pass	
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.11	Pass	
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Section 3.3 & RSS- Gen Section 8.9	ANSI C63.10 (2013) Section 6.10.5	Pass	
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Section 3.3 & RSS- Gen Section 8.9	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass	
99% Bandwidth	-	RSS-Gen Section 6.6	ANSI C63.10 Section 6.9.3	Pass	



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V by USB power
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.3 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-5.55dBi (Provided by the manufacturer)
S/N:	D954M244600001
Firmware Version:	V1.1.9

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645

4.3 Power level setting using in test

Channel	BLE
Charmer	1M
0	default
19	default
39	default



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4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8 RF Radiated Power	DC Dedicted Device	5.2dB (Below 1GHz)
	RF Radiated Power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
0	Dadiated Churiana Emission Test	4.5dB (30MHz-1GHz)
9	Radiated Spurious Emission Test —	5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

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



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4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

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

4.6 Test Facility

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

A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted I	Emission at Mains Terminal	s		•		
1	EMI Test Receive	R&S	ESCI	KS301101	01/15/2024	01/14/2025
2	LISN	R&S	ENV216	KS301197	01/15/2024	01/14/2025
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/15/2024	01/14/2025
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/15/2024	01/14/2025
5	CE test Cable	Thermax	/	CZ301102	01/15/2024	01/14/2025
6	Test Software	ESE	E3_V 6.111221a	/	N.C.R	N.C.R
RF Conduct	ed Test					
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/01/2024	07/31/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/01/2024	07/31/2025
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2024	01/14/2025
4	Signal Generator	R&S	SMBV100B	KSEM032	03/19/2024	03/18/2025
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/02/2024	08/01/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/01/2024	07/31/2025
7	Signal Generator	Agilent	E8257C	KS301066	08/06/2024	08/05/2025
8	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/01/2024	07/31/2025
9	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
10	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/12/2024	08/11/2025
11	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111- CZ301120	01/15/2024	01/14/2025
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/26/2024	08/25/2025
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
15	Software	BST	TST-PASS	/	NCR	NCR
RF Radiated	Test		<u> </u>			
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	08/06/2024	08/05/2025
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	03/19/2024	03/18/2025
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	03/18/2023	03/17/2025
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2023	06/28/2025
6	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E006	03/19/2024	03/18/2025
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	03/23/2024	08/22/2026
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	04/07/2023	04/06/2025
9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	01/07/2024	01/06/2026
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/15/2024	01/14/2025
11	Amplifier(18~40GHz)	PANSHAN TECHNOLOGY	LNA180400G40	KSEM038	08/12/2024	08/11/2025
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	08/12/2024	08/11/2025
13	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	03/21/2024	03/20/2025
14	Software	Faratronic	EZ_EMC-v 3A1	/	NCR	NCR
15	Software	ESE	E3_V 6.111221a	/	NCR	NCR



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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 -5.55dBi.

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	Conducted limit(dBμV)		
emission(MHz)	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 (9k	Hz resolution bandwidth) 0.15M	to 30MHz	

7.1.1 E.U.T. Operation

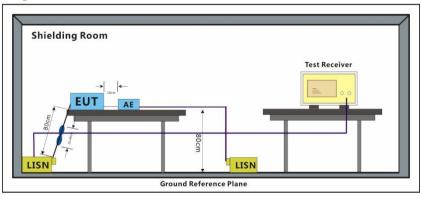
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode(1Mbps)_Keep the EUT in 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 $50 \text{ohm}/50 \mu\text{H} + 5 \text{ohm}$ 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

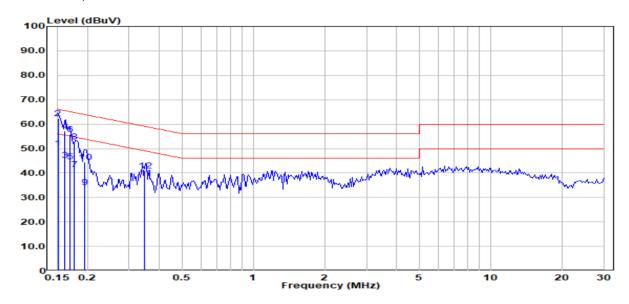


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Test Mode: 01; Line: Live line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1502	29.97	20.25	50.22	55.99	-5.77	Average
2	0.1502	42.04	20.25	62.29	65.99	-3.70	QP
3	0.1601	25.11	20.21	45.32	55.46	-10.14	Average
4	0.1601	36.97	20.21	57.18	65.46	-8.28	QP
5	0.1687	24.63	20.17	44.80	55.03	-10.23	Average
6	0.1687	35.76	20.17	55.93	65.03	-9.10	QP
7	0.1760	21.19	20.14	41.33	54.67	-13.34	Average
8	0.1760	32.74	20.14	52.88	64.67	-11.79	QP
9	0.1954	14.19	20.07	34.26	53.80	-19.54	Average
10	0.1954	24.45	20.07	44.52	63.80	-19.28	QP
11	0.3492	17.75	20.07	37.82	48.98	-11.16	Average
12	0.3492	20.81	20.07	40.88	58.98	-18.10	QP

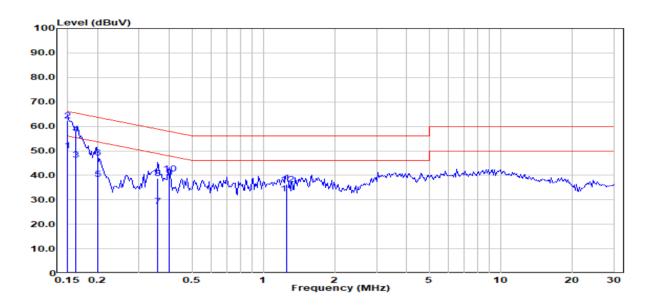


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Test Mode: 01; Line: Neutral Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1501	30.04	20.18	50.22	56.00	-5.78	Average
2	0.1501	42.06	20.18	62.24	66.00	-3.76	QP
3	0.1617	26.12	20.17	46.29	55.38	-9.09	Average
4	0.1617	36.73	20.17	56.90	65.38	-8.48	QP
5	0.2002	18.31	20.11	38.42	53.60	-15.18	Average
6	0.2002	27.16	20.11	47.27	63.60	-16.33	QP
7	0.3593	7.34	20.10	27.44	48.74	-21.30	Average
8	0.3593	18.72	20.10	38.82	58.74	-19.92	QP
9	0.4028	18.82	20.11	38.93	47.80	-8.87	Average
10	0.4028	20.50	20.11	40.61	57.80	-17.19	QP
11	1.2570	12.66	19.90	32.56	46.00	-13.44	Average
12	1.2570	16.39	19.90	36.29	56.00	-19.71	QP



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7.2 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

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.

7.2.1 E.U.T. Operation

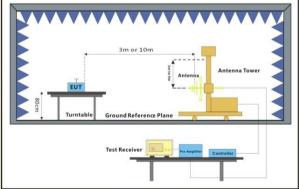
Operating Environment:

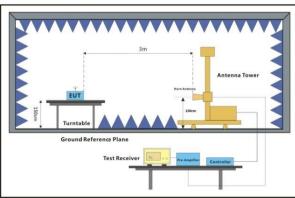
Temperature: 20.5 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

7.2.2 103010	1.2.2 Test made besorption									
Pre-scan / Final test	Mode Code	Description								
Final test	01	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.								

7.2.3 Test Setup Diagram





30MHz-1GHz Above 1GHz



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7.2.4 Measurement Procedure and Data

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

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

Remark 4:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is \geq 1/T (Duty cycle \leq 98%) or 10Hz (Duty cycle \geq 98%) for Average detection (AV) at frequency above 1GHz.

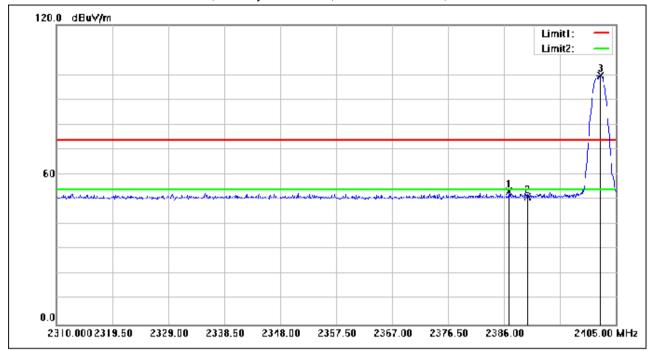


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Test Mode: 01; Polarity: Horizontal; Modulation: GFSK; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2386.855	77.85	-24.72	53.13	74.00	-20.87	peak
2	2390.000	75.97	-24.71	51.26	74.00	-22.74	peak
3	2402.340	124.39	-24.65	99.74	74.00	25.74	peak

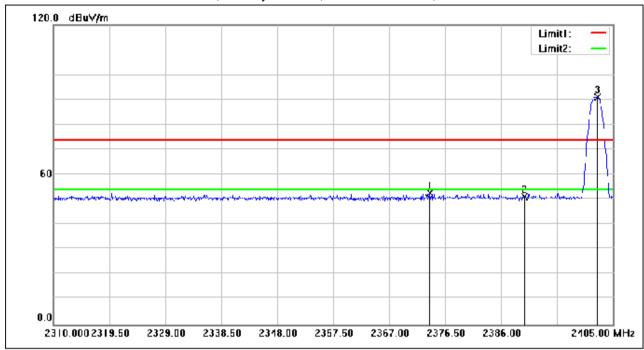


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2373.935	77.45	-24.78	52.67	74.00	-21.33	peak
2	2390.000	75.83	-24.71	51.12	74.00	-22.88	peak
3	2402.340	115.70	-24.65	91.05	74.00	17.05	peak

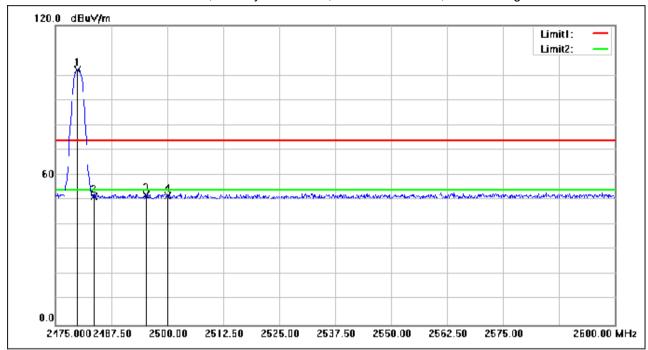


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2479.875	126.41	-24.28	102.13	74.00	28.13	peak
2	2483.500	75.77	-24.27	51.50	74.00	-22.50	peak
3	2495.250	76.28	-24.21	52.07	74.00	-21.93	peak
4	2500.000	75.99	-24.19	51.80	74.00	-22.20	peak

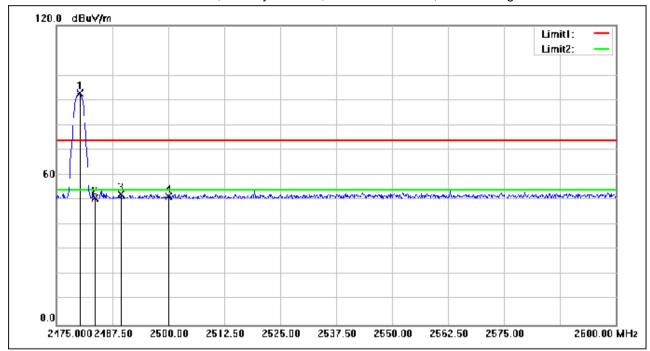


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.250	117.05	-24.28	92.77	74.00	18.77	peak
2	2483.500	75.26	-24.27	50.99	74.00	-23.01	peak
3	2489.375	76.59	-24.24	52.35	74.00	-21.65	peak
4	2500.000	75.62	-24.19	51.43	74.00	-22.57	peak



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7.3 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:

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

7.3.1 E.U.T. Operation

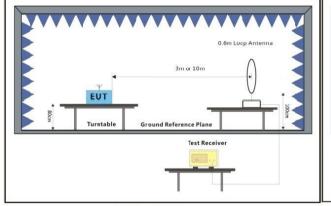
Operating Environment:

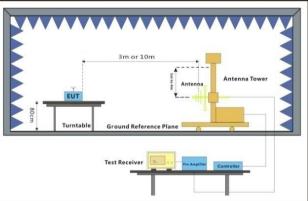
Temperature: 20.5 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

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

7.3.3 Test Setup Diagram





Below 30MHz 30MHz 30MHz-1GHz



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7.3.4 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.

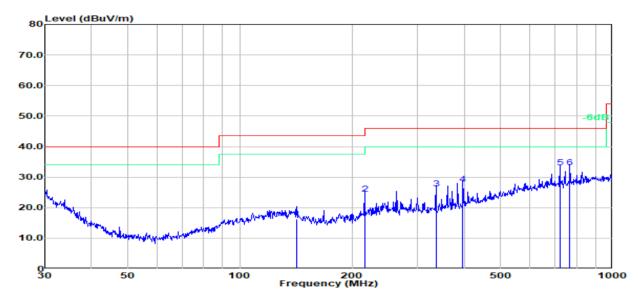


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Test Mode: 01; Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	141.8260	2.48	13.87	16.35	43.50	-27.15	100	108	QP
2	216.0240	12.19	12.39	24.58	46.00	-21.42	200	40	QP
3	336.0350	10.06	16.22	26.28	46.00	-19.72	100	356	QP
4	396.2420	10.08	17.76	27.84	46.00	-18.16	100	165	QP
5	721.7260	8.96	24.16	33.12	46.00	-12.88	200	117	QP
6	768.7480	8.75	24.41	33.16	46.00	-12.84	100	356	QP

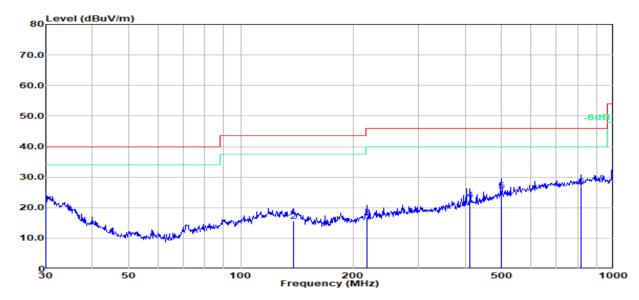


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Test Mode: 01; Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	30.0000	1.61	19.42	21.03	40.00	-18.97	200	280	QP
2	138.8740	0.93	14.71	15.64	43.50	-27.86	100	271	QP
3	217.5440	4.28	12.54	16.82	46.00	-29.18	100	50	QP
4	411.8240	4.33	18.29	22.62	46.00	-23.38	200	280	QP
5	501.1790	4.68	20.91	25.59	46.00	-20.41	100	176	QP
6	815.9680	2.38	24.41	26.79	46.00	-19.21	200	346	QP



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7.4 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	

7.4.1 E.U.T. Operation

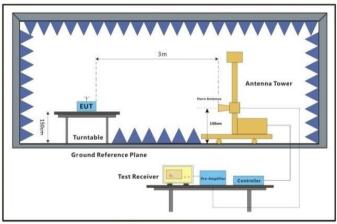
Operating Environment:

Temperature: 20.5 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

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

7.4.3 Test Setup Diagram



Above 1GHz



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7.4.4 Measurement Procedure and Data

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

- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

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

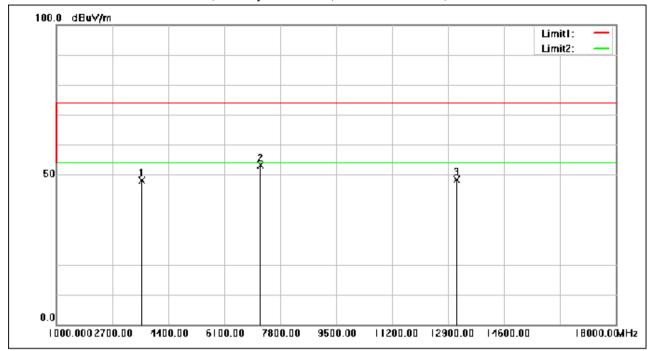


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3601.060	69.59	-21.49	48.10	74.00	-25.90	peak
2	7205.480	64.59	-11.47	53.12	74.00	-20.88	peak
3	13155.330	54.75	-6.28	48.47	74.00	-25.53	peak

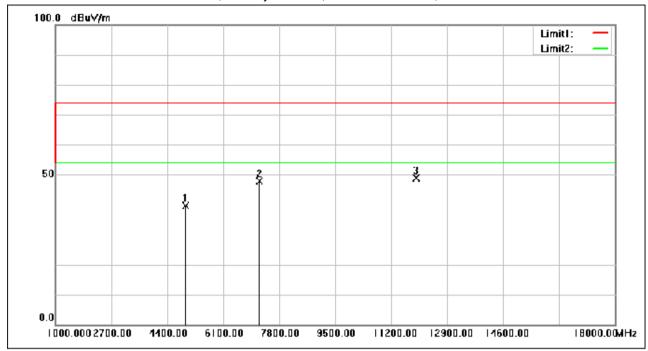


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4944.550	58.06	-18.48	39.58	74.00	-34.42	peak
2	7205.310	59.27	-11.47	47.80	74.00	-26.20	peak
3	11948.270	54.85	-5.97	48.88	74.00	-25.12	peak

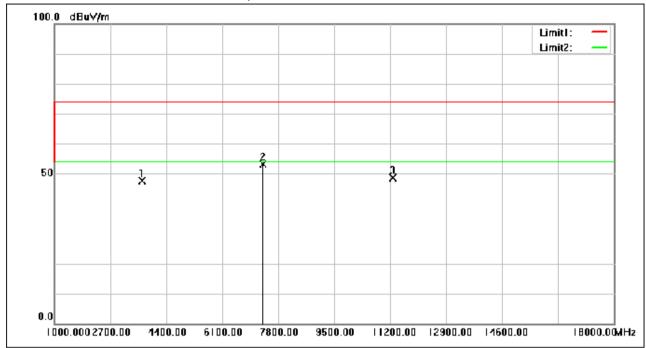


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3652.150	68.93	-21.30	47.63	74.00	-26.37	peak
2	7324.430	64.54	-11.42	53.12	74.00	-20.88	peak
3	11285.390	55.14	-6.53	48.61	74.00	-25.39	peak

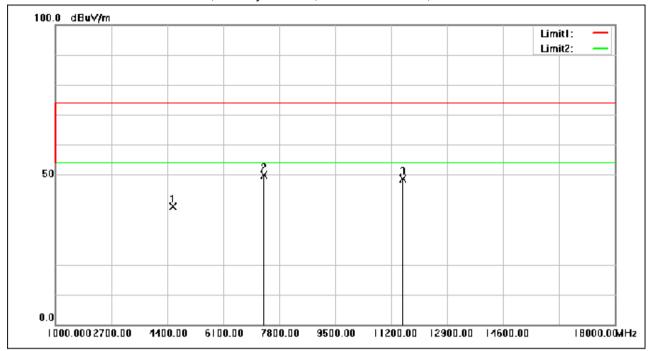


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4570.590	58.24	-18.75	39.49	74.00	-34.51	peak
2	7324.390	61.29	-11.42	49.87	74.00	-24.13	peak
3	11540.240	54.88	-6.33	48.55	74.00	-25.45	peak

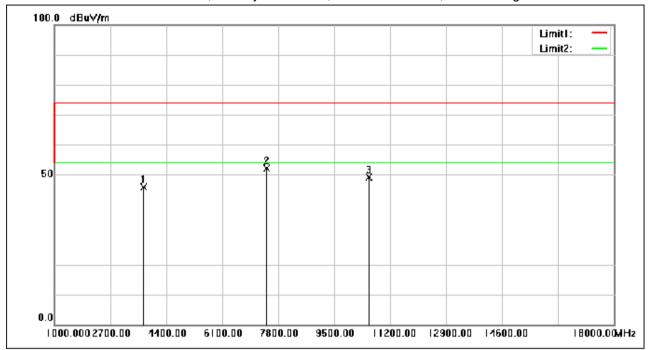


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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3718.880	67.00	-21.05	45.95	74.00	-28.05	peak
2	7439.172	63.48	-11.34	52.14	74.00	-21.86	peak
3	10570.084	56.02	-7.00	49.02	74.00	-24.98	peak

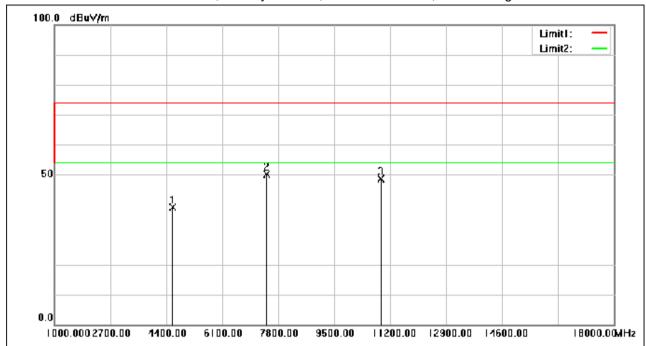


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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



No.	Frequency	Reading	Correction	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4594.949	57.88	-18.69	39.19	74.00	-34.81	peak
2	7439.172	61.48	-11.34	50.14	74.00	-23.86	peak
3	10923.445	55.39	-6.80	48.59	74.00	-25.41	peak



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7.5 Conducted Peak Output Power

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

Limit:

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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

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

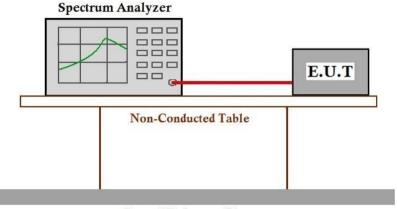


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7.5.3 Test Setup Diagram



Ground Reference Plane

7.5.4 Measurement Procedure and Data

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



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7.6 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

7.6.1 E.U.T. Operation

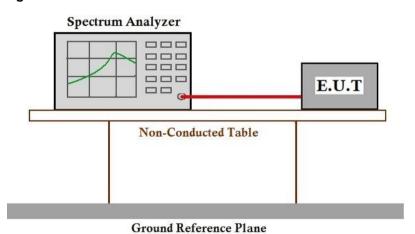
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

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

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data



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7.7 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

7.7.1 E.U.T. Operation

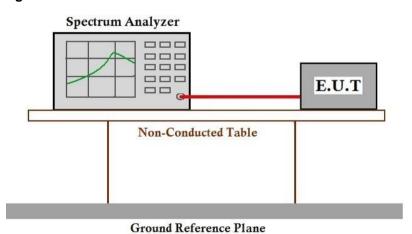
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

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

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data



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7.8 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).

7.8.1 E.U.T. Operation

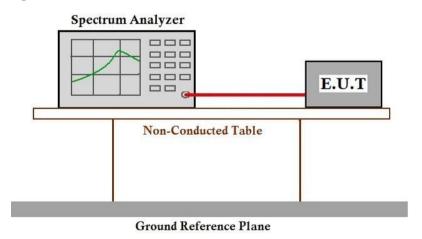
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

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

7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data



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7.9 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).

7.9.1 E.U.T. Operation

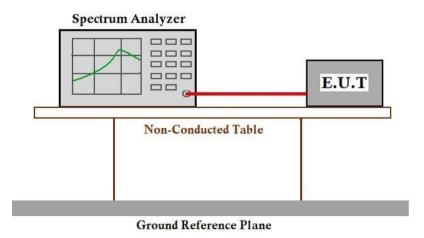
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

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

7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.10 99% Bandwidth

Test Requirement RSS-Gen Section 6.7

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

7.10.1 E.U.T. Operation

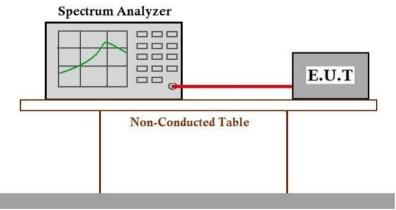
Operating Environment:

Temperature: 20.1 °C Humidity: 42.3 % RH Atmospheric Pressure: 1010 mbar

7.10.2 Test Mode Description

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

7.10.3 Test Setup Diagram



Ground Reference Plane

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 KSCR22411002264AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2411002264AT



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10 Appendix

1. Duty Cycle

1.1 Test Result

1.1.1 Ant1

	Ant1								
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)		
		2402	0.431	0.625	68.96	1.61	0.04		
1M	SISO	2440	0.431	0.626	68.85	1.62	0.04		
		2480	0.431	0.625	68.96	1.61	0.03		



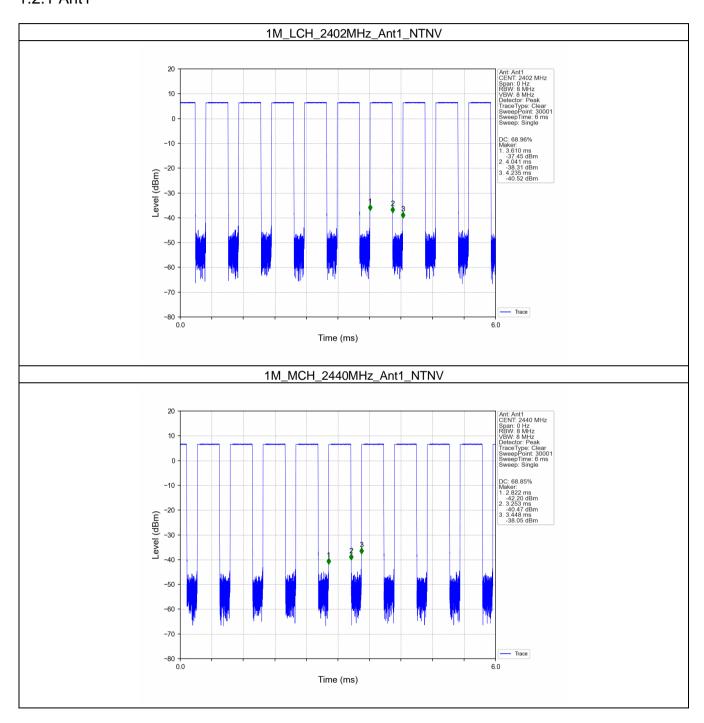
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1.2 Test Graph

1.2.1 Ant1

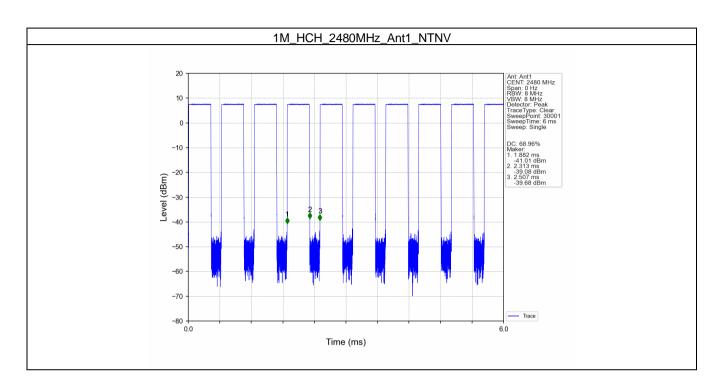




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2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode TX Type	TX	Frequency	ANT	99% Occupied E	Verdict	
	(MHz)	ANI	Result	Limit		
1M	SISO	2402	1	1.012	/	Pass
		2440	1	1.013	/	Pass
		2480	1	1.013	/	Pass

2.1.2 6dB BW

	TX	Frequency	ANT	6dB Bandv	\/a =diat	
	Type	(MHz)		Result	Limit	Verdict
1M	SISO	2402	1	0.666	>=0.5	Pass
		2440	1	0.667	>=0.5	Pass
		2480	1	0.667	>=0.5	Pass



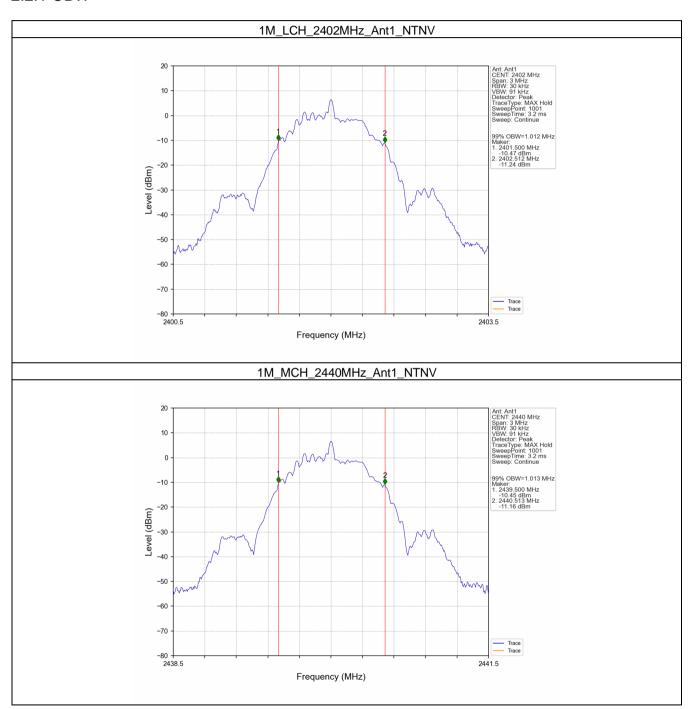
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2.2 Test Graph

2.2.1 OBW

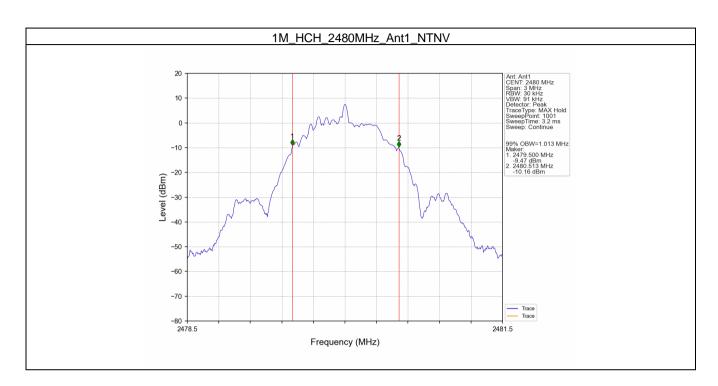




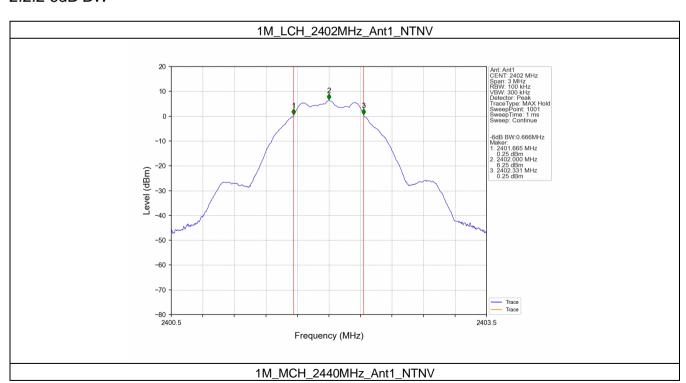
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2.2.2 6dB BW

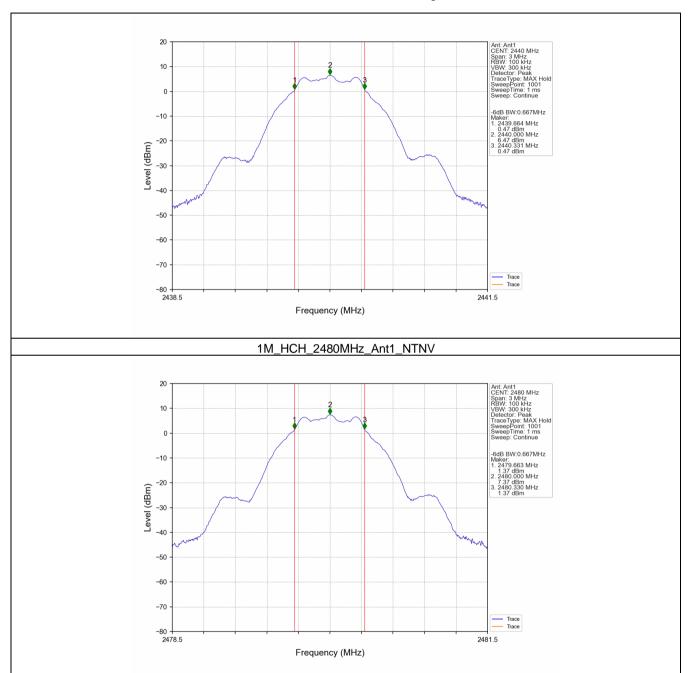




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3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mada TX		Frequency	Maximum Peak Conduc	Verdict			
Mode	Type	(MHz)	ANT1	Limit	verdict		
	2402	6.45	<=30	Pass			
1M	SISO	2440	6.67	<=30	Pass		
		2480	7.53	<=30	Pass		
Note1: Antenn	Note1: Antenna Gain: Ant1: -5.55dBi;						

......

3.1.2 EIRP

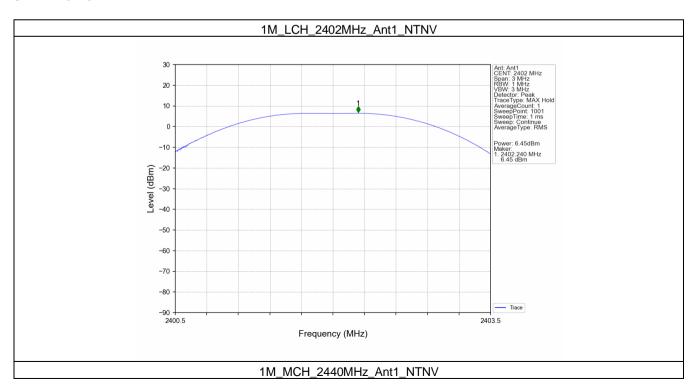
Mode	TX	Frequency	E.I.R.F	\/o.rd;	
Mode	Type	(MHz)	ANT1	Limit	Verdict
1M	SISO	2402	0.90	<=36.02	Pass
		2440	1.12	<=36.02	Pass
		2480	1.98	<=36.02	Pass

Note1: Antenna Gain: Ant1: -5.55dBi;

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

3.2 Test Graph

3.2.1 Power

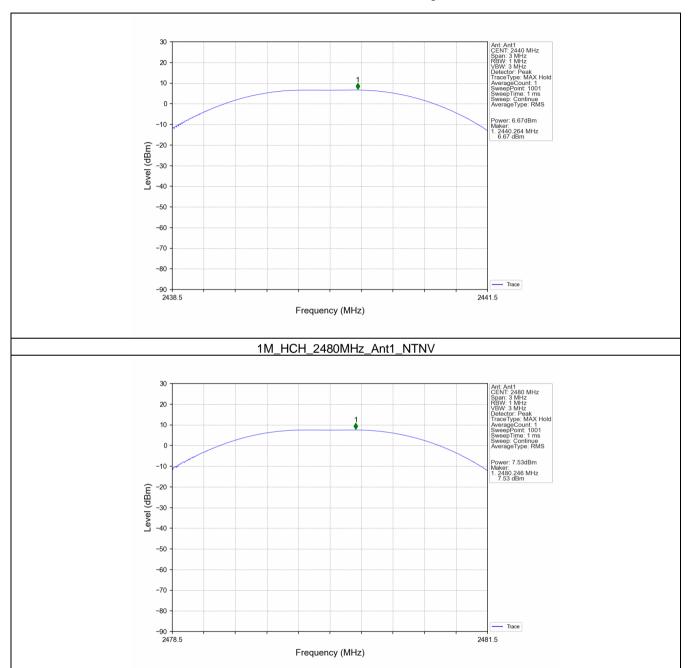




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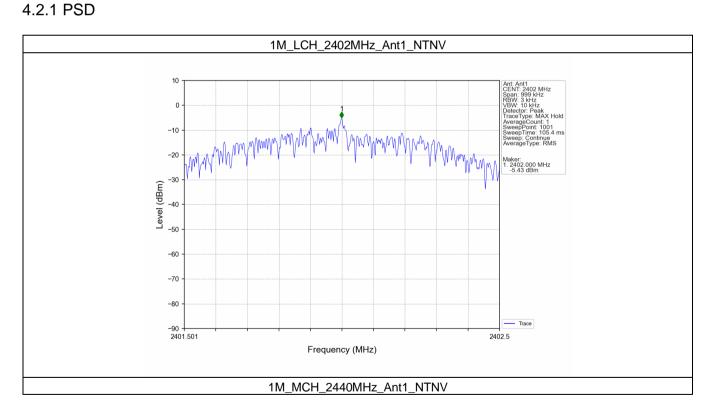
4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

Mode	TX	Frequency	Maximum PS	Vordict			
Mode	Type	(MHz)	ANT1	Limit	Verdict		
		2402	-5.43	<=8	Pass		
1M	SISO	2440	-5.24	<=8	Pass		
		2480	-4.26	<=8	Pass		
Note1: Antenna Gain: Ant1: -5.55dBi:							

4.2 Test Graph

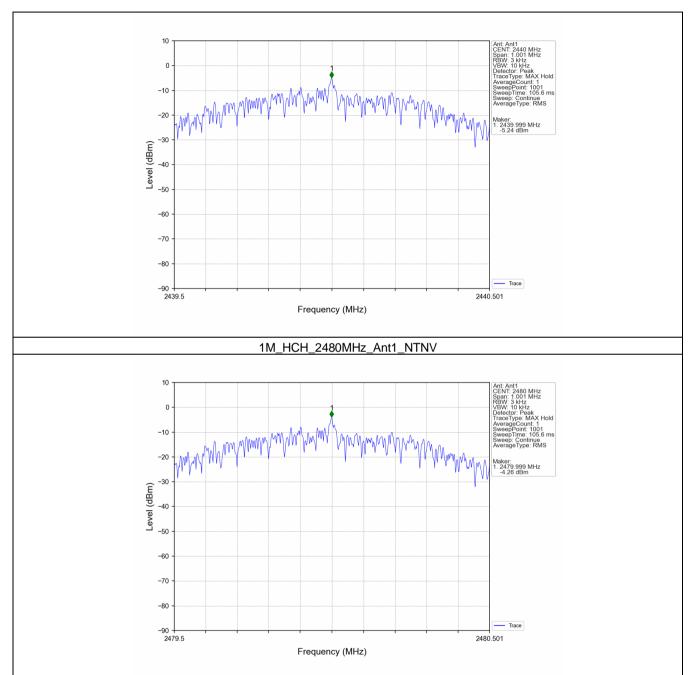




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5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
		2402	1	6.22
1M	SISO	2440	1	6.46
	0.00	2480	1	7.37

Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
		2402	1	7.37	-12.63	Pass
1M	SISO	2440	1	7.37	-12.63	Pass
		2480	1	7.37	-12.63	Pass

Note1: Refer to RSS-247 Issue 2 section 5.5 and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.



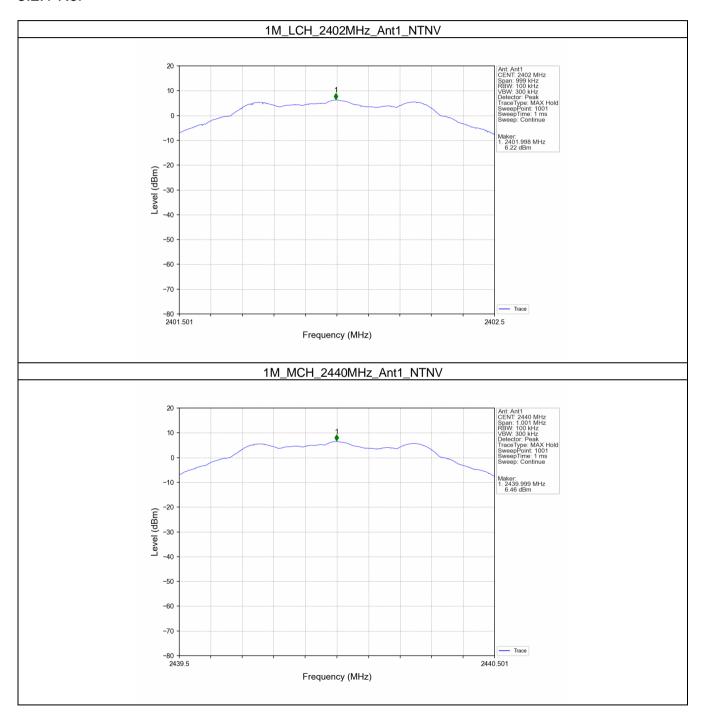
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5.2 Test Graph

5.2.1 Ref

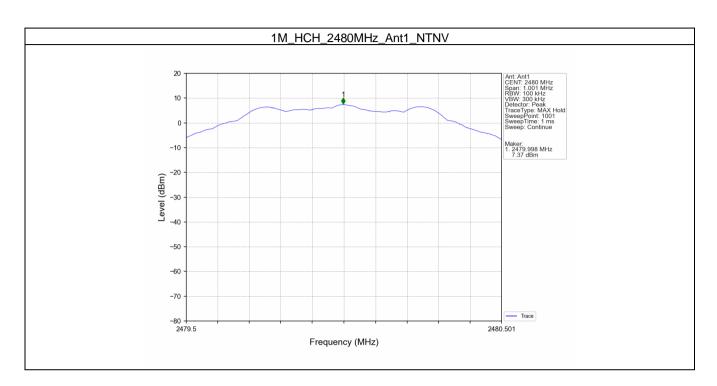




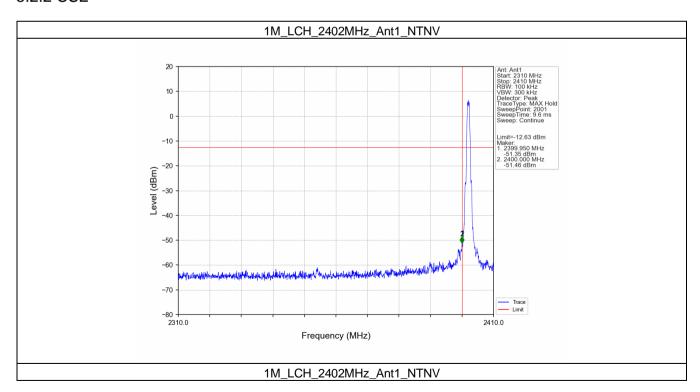
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5.2.2 CSE

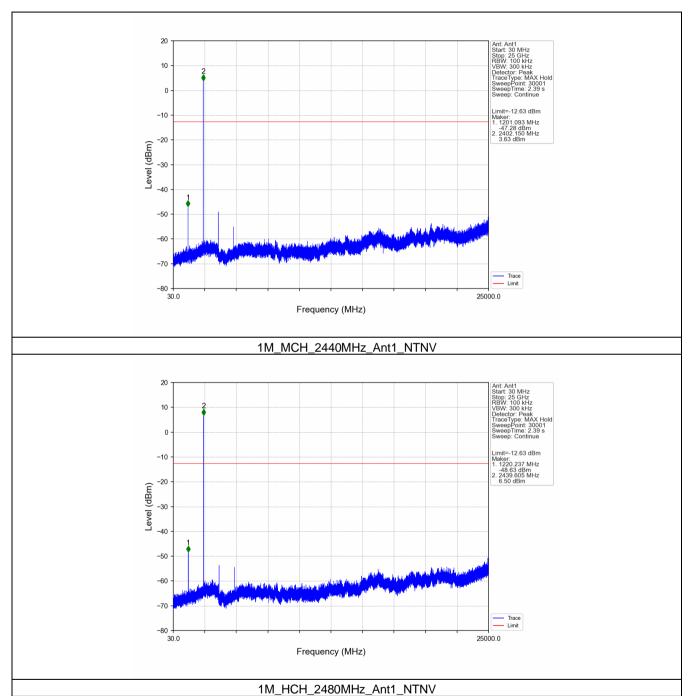




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