

Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR220900037102

Page: 1 of 67

TEST REPORT

Application No.:	FYCR2209000371AT
Applicant:	Beijing Siemens Cerberus Electronics Ltd.
Address of Applicant:	No 1, Fengzhi East Road, Xibeiwang, Haidian District 100094 BEIJING, 100094 China
Manufacturer:	Siemens Switzerland Ltd.
Address of Manufacturer:	Theilerstrasse 1a, CH-6300 Zug / Switzerland
Factory:	Shenzhen Guanglian Zhitong Technology Co., LTD
Address of Factory:	Room 305, 306, Chuangwei Digital Building, Songbai Road, Shiyan Street, Baoan District, Shenzhen
Equipment Under Test (EUT):	
EUT Name:	KNX IoT to BACnet/IP Gateway
Model No.:	OCT200.KNBA
Trade Mark:	Siemens
FCC ID:	2AL8AOCT200
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2022-09-15
Date of Test:	2022-09-22 to 2023-02-14
Date of Issue:	2023-02-16
Test Result:	Pass*

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



Winkey Wang
EMC Technical Manager



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Revision Record

Version	Chapter	Date	Modifier	Remark
01		2023-02-16		Original

Authorized for issue by:

	 _____ Tree Zhan/Project Engineer		
	 _____ Winkey Wang/Reviewer		

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2 Test Summary

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

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	Switching Power Supply: Model: ICP12-120-1000D AC Input: 100-240V~ 50/60Hz MAX.0.3A DC Output: 12V/1A
Cable(s):	DC cable:150cm unshielded
Operation Frequency:	2405MHz to 2480MHz
Modulation Type:	O-QPSK
Number of Channels:	16
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	2.37 dBi

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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

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

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4.4 Test Location

All tests were performed at:

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

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **A2LA (Certificate No. 6606.01)**

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

- **FCC –Designation Number: CN1322**

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

Designation Number: CN1322. Test Firm Registration Number: 718073

- **Innovation, Science and Economic Development Canada**

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

CAB identifier: CN0129.

IC#: 28189.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	CRT	N/A	SEM001-14	2021/7/13	2024/7/12
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-01	2022/7/12	2023/7/11
Two-Line V-Network	Rohde & Schwarz	ENV216	SEM007-16	2022/7/12	2023/7/11
Two-Line V-Network	Rohde & Schwarz	ESH3-Z5	SEM007-22	2022/1/10	2023/1/9
				2023/1/8	2024/1/7
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

Conducted Peak Output Power					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2022/7/12	2023/7/11
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Signal Generator	Agilent	N5173B	SEM006-05	2022/7/12	2023/7/11
ESG Vector Signal Generator	Agilent	E4438C	SEM006-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-08	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2022/7/12	2023/7/11
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Signal Generator	Agilent	N5173B	SEM006-05	2022/7/12	2023/7/11
ESG Vector Signal Generator	Agilent	E4438C	SEM006-15	2022/7/12	2023/7/11

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Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-08	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Power Spectrum Density					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2022/7/12	2023/7/11
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Signal Generator	Agilent	N5173B	SEM006-05	2022/7/12	2023/7/11
ESG Vector Signal Generator	Agilent	E4438C	SEM006-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-08	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2022/7/12	2023/7/11
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Signal Generator	Agilent	N5173B	SEM006-05	2022/7/12	2023/7/11
ESG Vector Signal Generator	Agilent	E4438C	SEM006-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11

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Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-08	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Conducted Spurious Emissions

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2022/7/12	2023/7/11
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Signal Generator	Agilent	N5173B	SEM006-05	2022/7/12	2023/7/11
ESG Vector Signal Generator	Agilent	E4438C	SEM006-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-08	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Radiated Emissions which fall in the restricted bands

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

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Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2022/4/15	2023/4/14
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

Radiated Spurious Emissions Below 1GHz

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
Loop Antenna	ETS-LINDGREN	6502	SEM003-36	2021/9/26	2024/9/25
MXE EMI receiver	Agilent	N9038A	SEM004-05	2022/7/12	2023/7/11
Pre-amplifier	HP	8447D	SEM005-02	2022/7/12	2023/7/11
Coaxial Cable	CCS	N/A	SEM035-01	2022/5/16	2023/5/15
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

Radiated Spurious Emissions Above 1GHz

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

General used equipment

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

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

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 2.37 dBi.

Antenna location: Refer to internal photo.



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7 Radio Spectrum Matter Test Results

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

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dB μ V)	
	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: 22.3 °C Humidity: 52.4 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

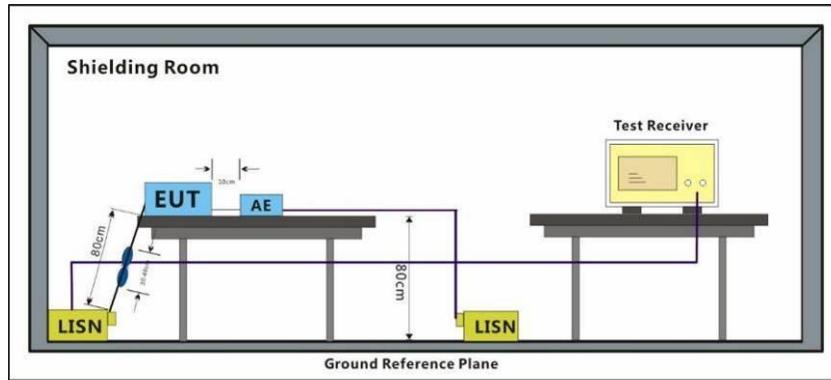
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

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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/50 μ H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

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



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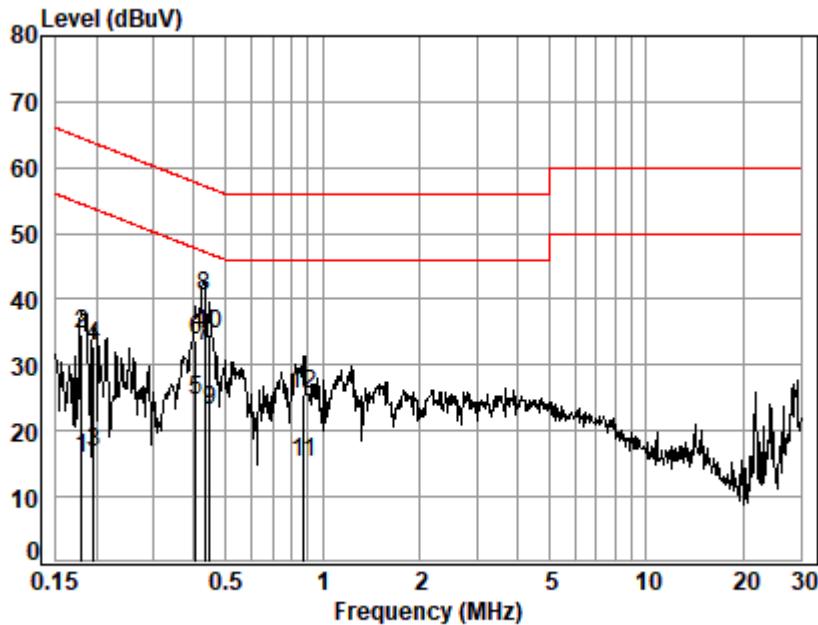
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Test Mode: 00; Line: Live line



Site : Shielding Room

Condition: Line

Job No. : 00371AT

Test mode: 00

1	0.1796	0.02	0.26	15.51	15.79	54.50	-38.71	Over
								Remark
Freq	Loss	Factor	Level	Level	dBuV	dBuV	dB	
MHz	dB		dB	dBuV				
2	0.1796	0.02	0.26	34.31	34.59	64.50	-29.91	QP
3	0.1965	0.02	0.26	16.31	16.59	53.76	-37.17	Average
4	0.1965	0.02	0.26	32.70	32.98	63.76	-30.78	QP
5	0.4040	0.03	0.27	24.47	24.77	47.77	-23.00	Average
6	0.4040	0.03	0.27	33.38	33.68	57.77	-24.09	QP
7	0.4328	0.02	0.27	32.48	32.77	47.20	-14.43	Average
8	0.4328	0.02	0.27	40.02	40.31	57.20	-16.89	QP
9	0.4492	0.02	0.27	22.77	23.06	46.89	-23.83	Average
10	0.4492	0.02	0.27	34.35	34.64	56.89	-22.25	QP
11	0.8757	0.02	0.20	15.12	15.34	46.00	-30.66	Average
12	0.8757	0.02	0.20	25.22	25.44	56.00	-30.56	QP



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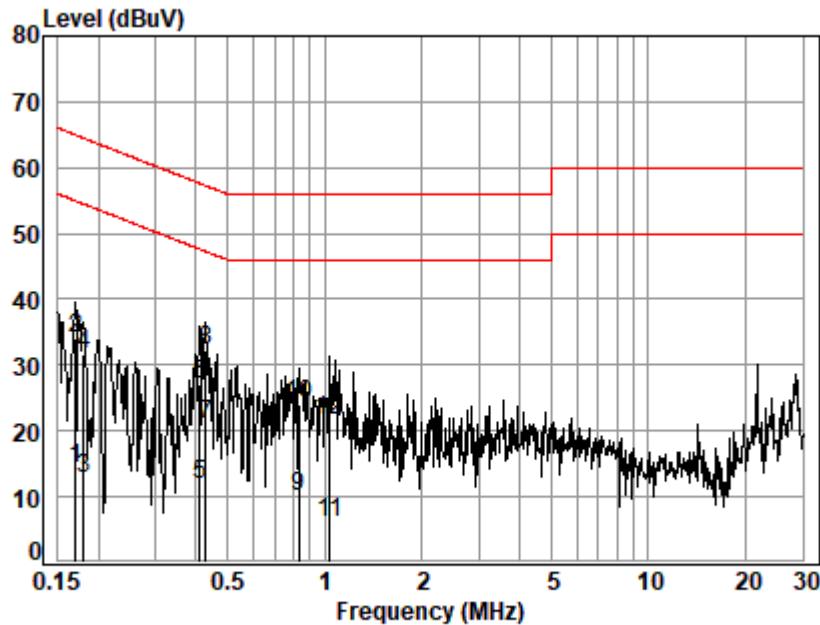
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Test Mode: 00; Line: Neutral Line



Site : Shielding Room

Condition: Neutral

Job No. : 00371AT

Test mode: 00

Freq	Cable	LISN	Read	Limit	Over	Remark
	Loss	Factor	Level	Level	Line	
	MHz	dB	dB	dBuV	dBuV	dB
1	0.1694	0.02	0.30	14.11	14.43	54.99 -40.56 Average
2	0.1694	0.02	0.30	33.60	33.92	64.99 -31.07 QP
3	0.1796	0.02	0.30	12.57	12.89	54.50 -41.61 Average
4	0.1796	0.02	0.30	31.44	31.76	64.50 -32.74 QP
5	0.4105	0.03	0.27	11.60	11.90	47.64 -35.74 Average
6	0.4105	0.03	0.27	26.80	27.10	57.64 -30.54 QP
7	0.4282	0.02	0.27	20.83	21.12	47.29 -26.17 Average
8	0.4282	0.02	0.27	32.08	32.37	57.29 -24.92 QP
9	0.8305	0.05	0.11	9.80	9.96	46.00 -36.04 Average
10	0.8305	0.05	0.11	23.80	23.96	56.00 -32.04 QP
11	1.0375	0.03	0.06	6.10	6.19	46.00 -39.81 Average
12	1.0375	0.03	0.06	21.50	21.59	56.00 -34.41 QP

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7.2 Conducted Peak Output Power

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

Limit:

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

7.2.1 E.U.T. Operation

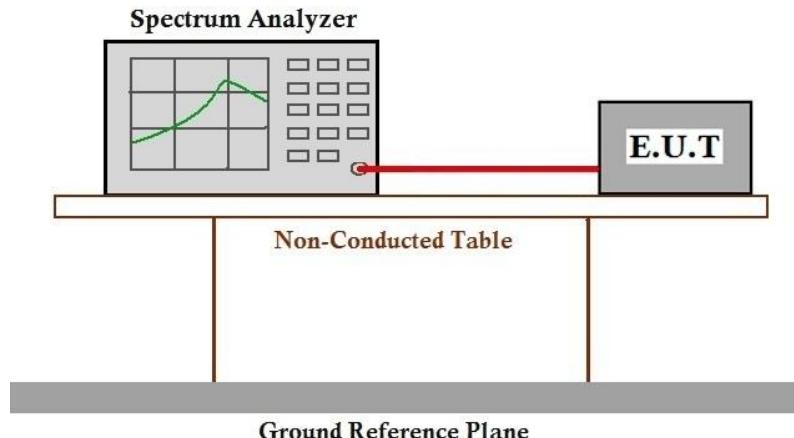
Operating Environment:

Temperature: 24.5 °C Humidity: 41.0 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.2.3 Test Setup Diagram



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7.2.4 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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7.3 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

7.3.1 E.U.T. Operation

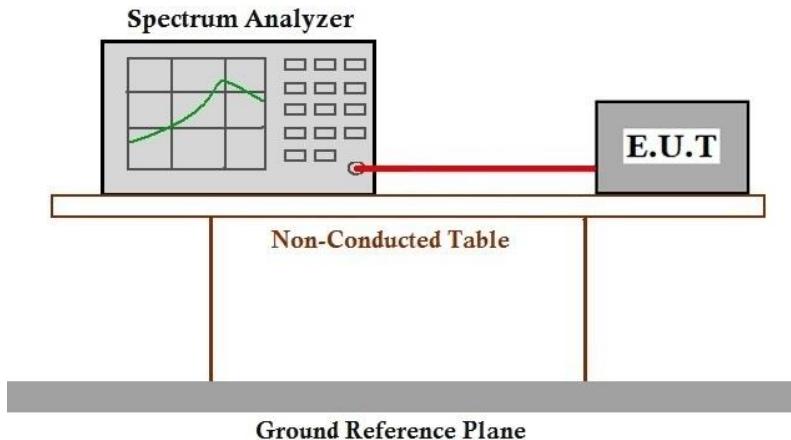
Operating Environment:

Temperature: 24.5 °C Humidity: 41.0 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.4 Power Spectrum Density

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

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

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

7.4.1 E.U.T. Operation

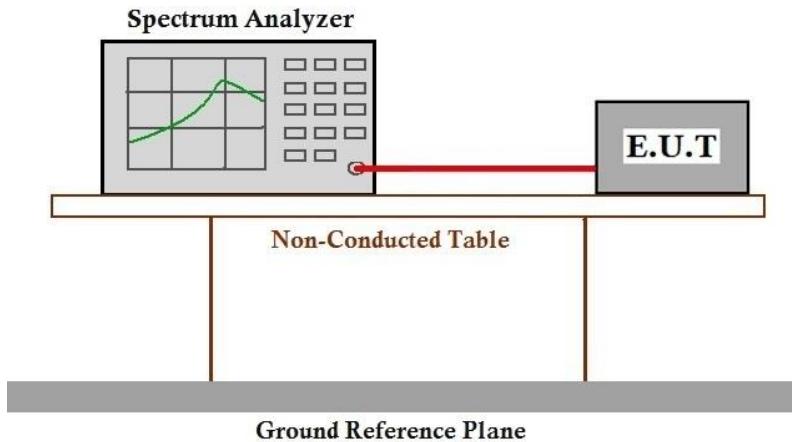
Operating Environment:

Temperature: 24.5 °C Humidity: 41.0 % RH Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

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

7.5.1 E.U.T. Operation

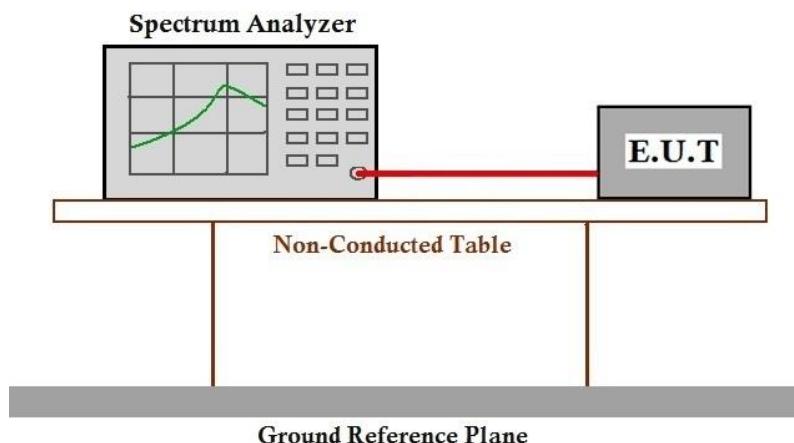
Operating Environment:

Temperature: 24.5 °C Humidity: 41.0 % RH Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.5.3 Test Setup Diagram



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7.5.4 Measurement Procedure and Data

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7.6 Conducted Spurious Emissions

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

Limit:

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

7.6.1 E.U.T. Operation

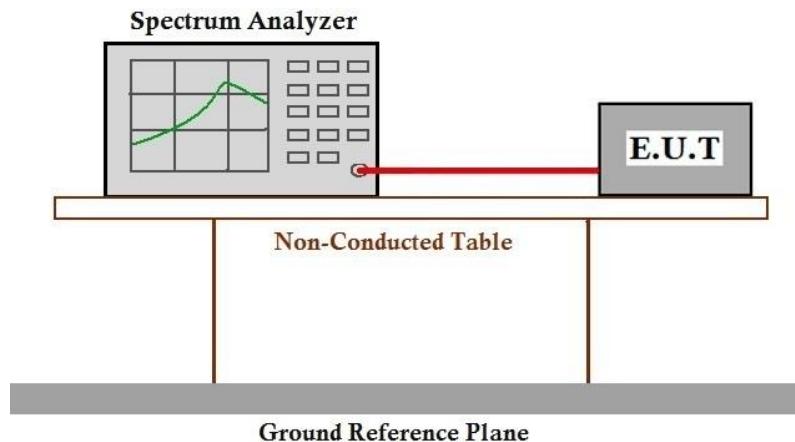
Operating Environment:

Temperature: 24.5 °C Humidity: 41.0 % RH Atmospheric Pressure: 1020 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.6.3 Test Setup Diagram



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7.6.4 Measurement Procedure and Data

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7.7 Radiated Emissions which fall in the restricted bands

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

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

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

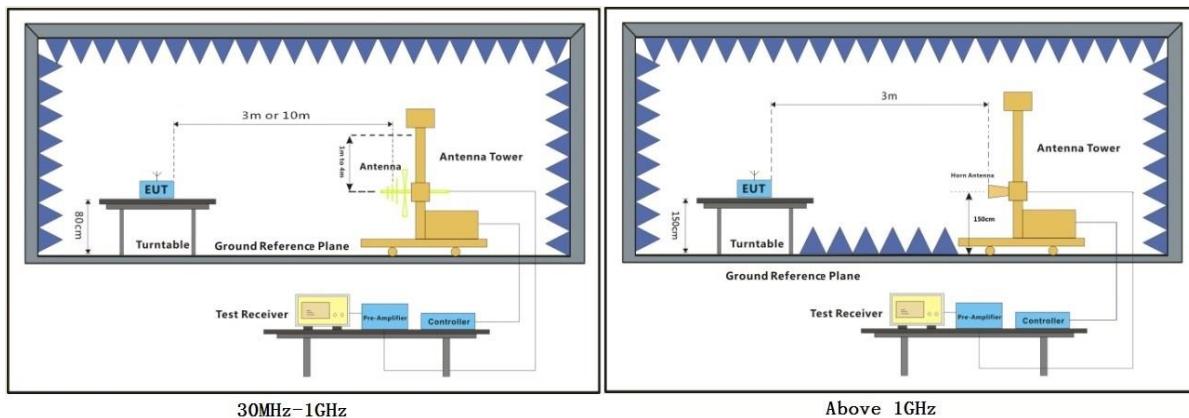
Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(Thread)_Keep the EUT in continuously transmitting with O-QPSK modulation mode. Only the data of worst case is recorded in the report
Final test	03	TX mode(Thread+2.4G WiFi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report

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7.7.3 Test Setup Diagram**7.7.4 Measurement Procedure and Data**

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

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

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



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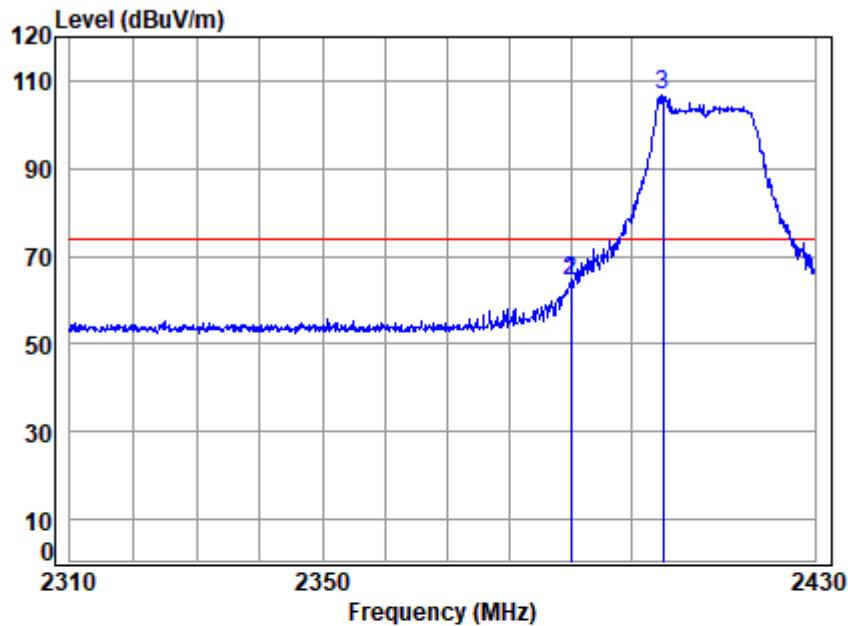
Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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Report No.: FYCR220900037102

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Test Mode: 03; Polarity: Horizontal; Modulation:O-QPSK+802.11g; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00371AT\00372AT
Mode : 2405 Band edge
Note :

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	5.05	27.16	32.50	64.62	64.33	74.00	-9.67	peak	
2	2390.000	5.05	27.16	32.50	64.62	64.33	74.00	-9.67	peak	
3	2405.000	5.06	27.19	32.50	107.01	106.76	74.00	32.76	peak	

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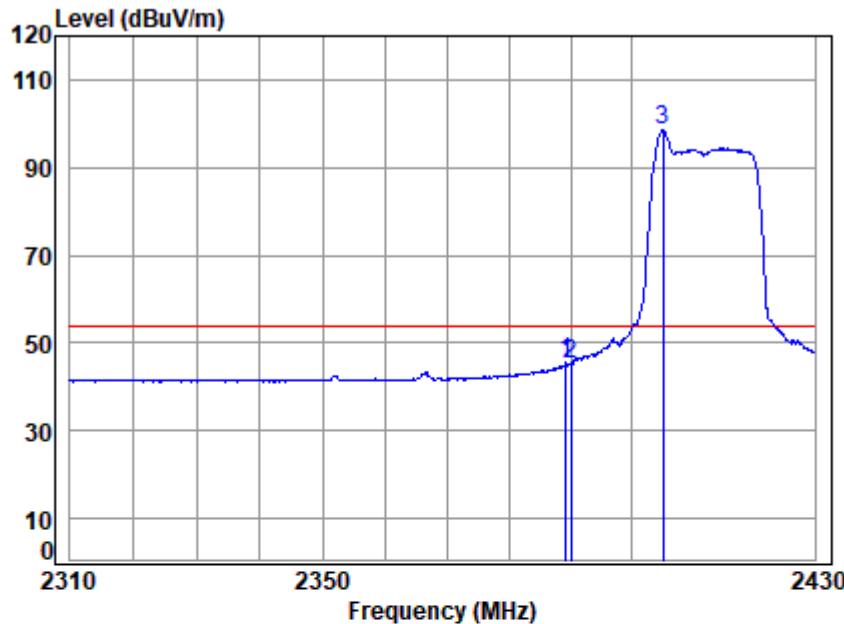
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Test Mode: 03; Polarity: Horizontal; Modulation: O-QPSK+802.11g; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL

Job No : 00371AT\00372AT

Mode : 2405 Band edge

Note :

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.242	5.05	27.16	32.50	45.80	45.51	54.00	-8.49	Average
2	2390.000	5.05	27.16	32.50	45.61	45.32	54.00	-8.68	Average
3	2405.000	5.06	27.19	32.50	98.93	98.68	54.00	44.68	Average



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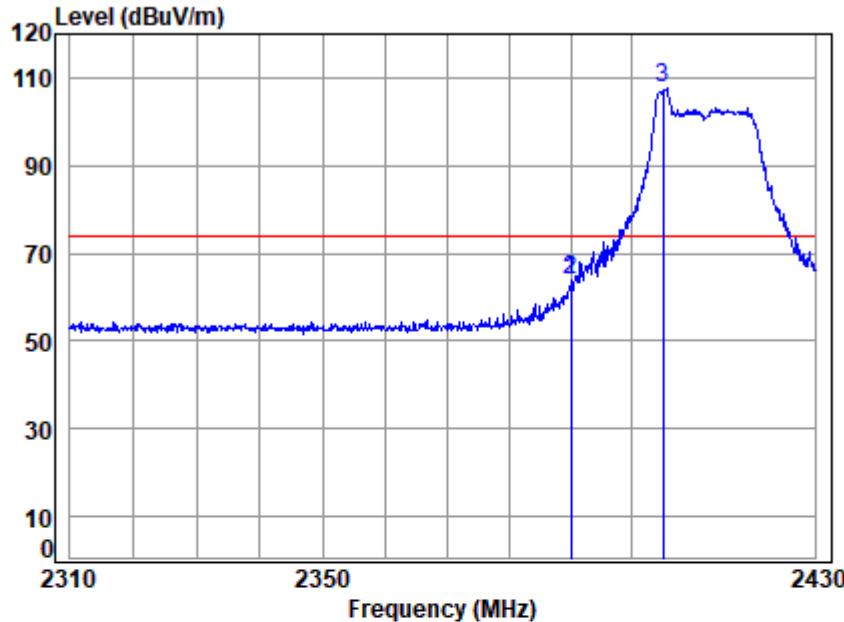
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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel:Low



Site : chamber

Condition: 3m VERTICAL

Job No : 00371AT\00372AT

Mode : 2405 Band edge

Note :

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Over Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	5.05	27.16	32.50	64.01	63.72	74.00	-10.28	Peak	
2	2390.000	5.05	27.16	32.50	64.01	63.72	74.00	-10.28	Peak	
3	2405.000	5.06	27.19	32.50	107.84	107.59	74.00	33.59	Peak	



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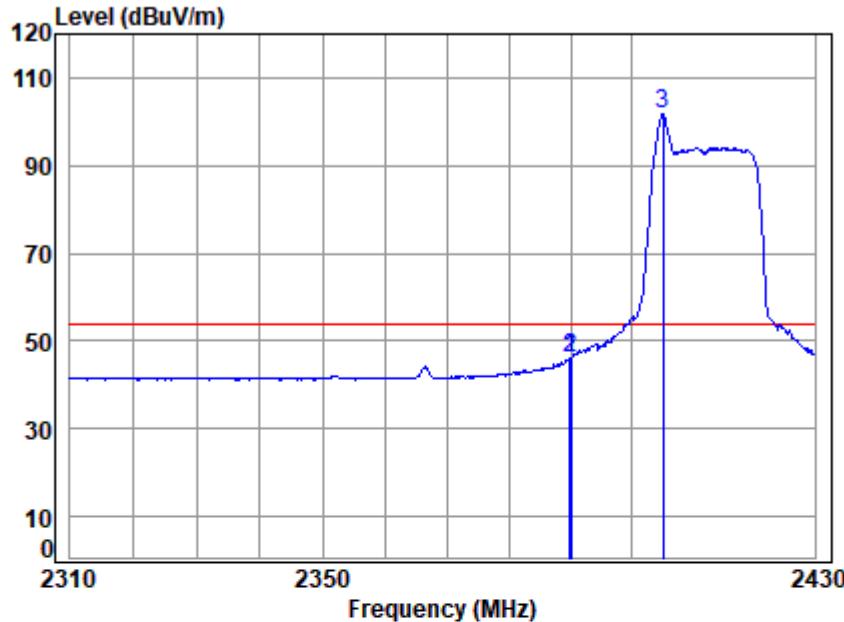
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Report No.: FYCR220900037102

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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel:Low



Site : chamber

Condition: 3m VERTICAL

Job No : 00371AT\00372AT

Mode : 2405 Band edge

Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	5.05	27.16	32.50	46.46	46.17	54.00	-7.83	Average
2	2390.000	5.05	27.16	32.50	46.44	46.15	54.00	-7.85	Average
3	2405.000	5.06	27.19	32.50	101.94	101.69	54.00	47.69	Average



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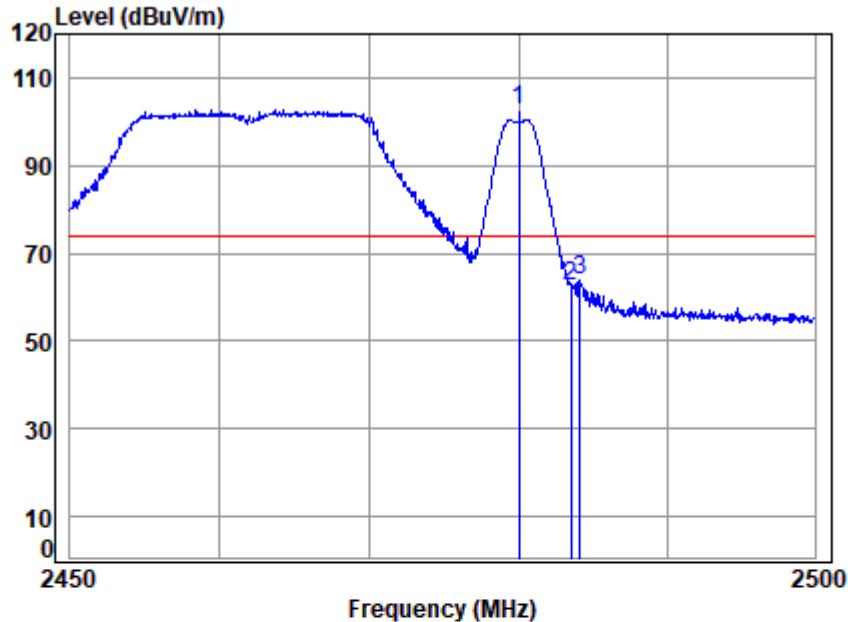
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Test Mode: 03; Polarity: Horizontal; Modulation: O-QPSK+802.11g; Channel:High



Site : chamber

Condition: 3m HORIZONTAL

Job No : 00371AT\00372AT

Mode : 2480 Band edge

Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 .	2480.000	5.12	27.36	32.50	102.84	102.82	74.00	28.82	peak
2	2483.500	5.12	27.36	32.50	62.45	62.43	74.00	-11.57	peak
3	2484.141	5.12	27.37	32.50	63.96	63.95	74.00	-10.05	peak



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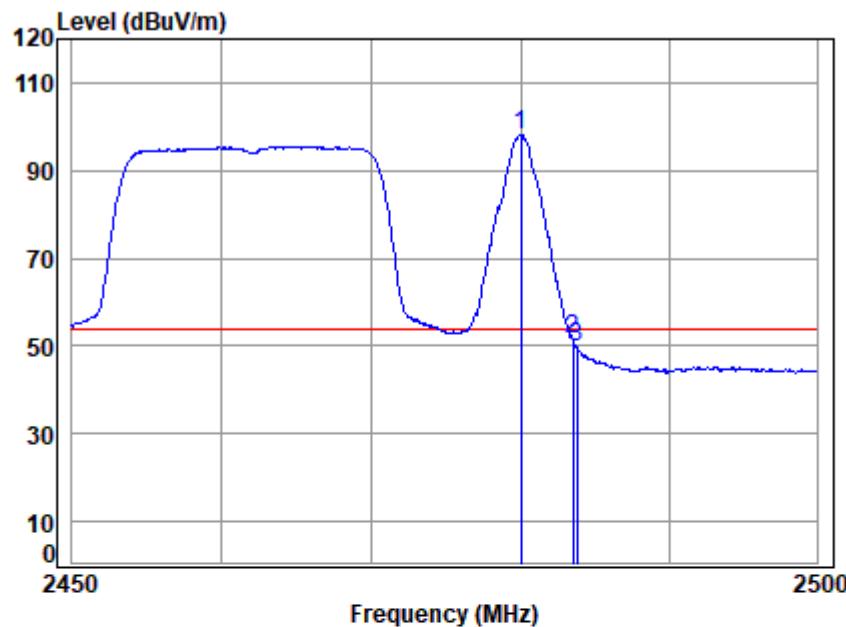
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Test Mode: 03; Polarity: Horizontal; Modulation: O-QPSK+802.11g; Channel:High



Site : chamber

Condition: 3m HORIZONTAL

Job No : 00371AT\00372AT

Mode : 2480 Band edge

Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 .	2480.000	5.12	27.36	32.50	98.15	98.13	54.00	44.13	Average
2	2483.500	5.12	27.36	32.50	51.57	51.55	54.00	-2.45	Average
3	2483.790	5.12	27.37	32.50	49.57	49.56	54.00	-4.44	Average



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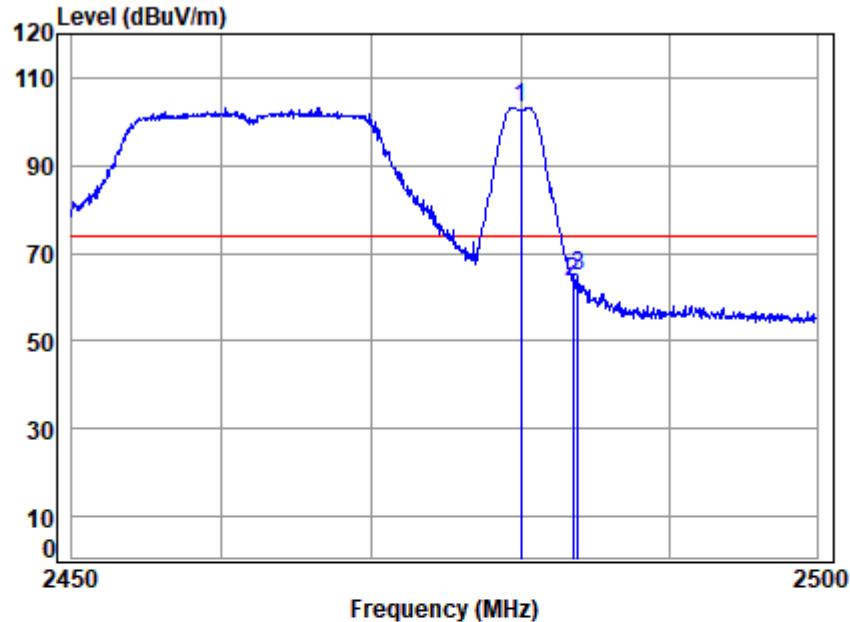
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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel:High



Site : chamber

Condition: 3m VERTICAL

Job No : 00371AT\00372AT

Mode : 2480 Band edge

Note :

Freq	Cable	Ant	Preamp	Read	Limit	Over	Over	
	Loss	Factor	Factor	Level				Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 . 2480.000	5.12	27.36	32.50	103.30	103.28	74.00	29.28	Peak
2 2483.500	5.12	27.36	32.50	63.36	63.34	74.00	-10.66	Peak
3 2483.890	5.12	27.37	32.50	64.88	64.87	74.00	-9.13	Peak



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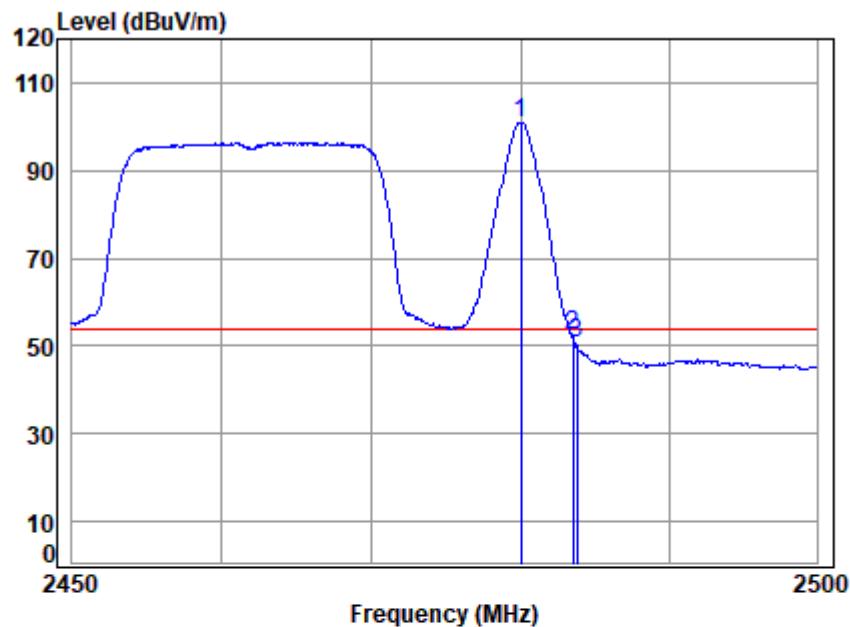
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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel:High



Site : chamber

Condition: 3m VERTICAL

Job No : 00371AT\00372AT

Mode : 2480 Band edge

Note :

Freq	Cable	Ant	Preamp	Read	Limit	Over	Over	
	Loss	Factor	Factor	Level				Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 . 2480.000	5.12	27.36	32.50	101.00	100.98	54.00	46.98	Average
2 2483.500	5.12	27.36	32.50	52.71	52.69	54.00	-1.31	Average
3 2483.790	5.12	27.37	32.50	50.61	50.60	54.00	-3.40	Average



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7.8 Radiated Spurious Emissions Below 1GHz

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

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.2 °C Humidity: 51.3 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

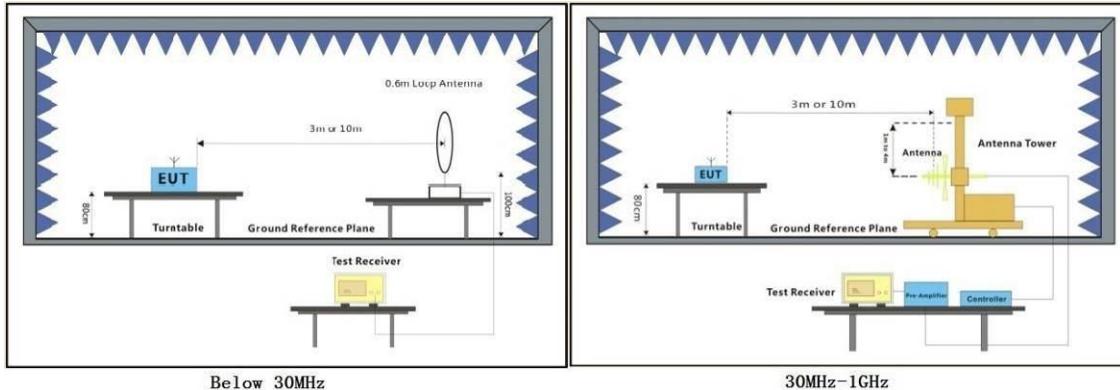
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(Thread)_Keep the EUT in continuously transmitting with O-QPSK modulation mode. Only the data of worst case is recorded in the report
Pre-scan	03	TX mode(Thread+2.4G WiFi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report

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7.8.3 Test Setup Diagram**7.8.4 Measurement Procedure and Data**

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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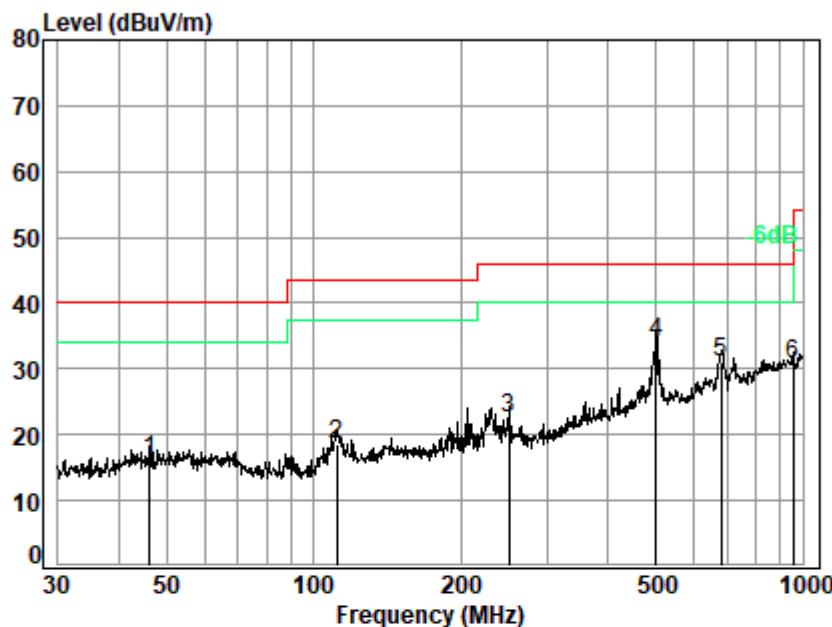
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Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00371AT
: 00

Freq	Cable	Ant	Preamp	Read	Limit	Over	Over	Remark
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	46.178	0.21	17.27	25.87	24.54	16.15	40.00	-23.85 QP
2	111.738	0.89	15.29	25.73	28.11	18.56	43.50	-24.94 QP
3	250.301	0.82	16.82	25.22	30.05	22.47	46.00	-23.53 QP
4	501.179	1.42	22.91	26.36	35.99	33.96	46.00	-12.04 QP
5	679.960	1.81	25.62	26.71	30.16	30.88	46.00	-15.12 QP
6	955.438	2.13	29.30	26.28	25.43	30.58	46.00	-15.42 QP

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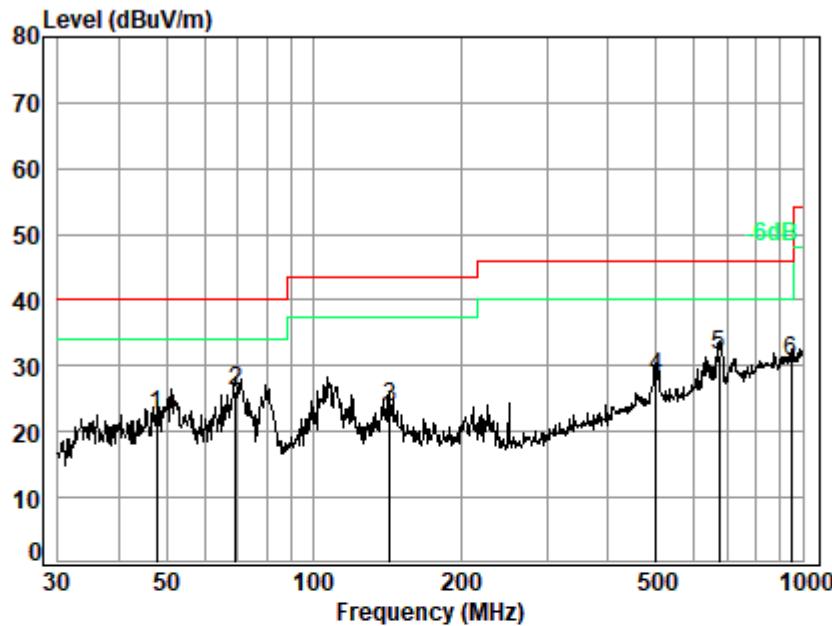
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Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00371AT
: 00

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	47.826	0.22	17.27	25.86	30.89	22.52	40.00	-17.48 QP
2	69.114	0.28	16.12	25.83	35.68	26.25	40.00	-13.75 QP
3	143.326	0.89	17.44	25.57	30.95	23.71	43.50	-19.79 QP
4	501.179	1.42	22.91	26.36	30.40	28.37	46.00	-17.63 QP
5	672.845	1.87	25.51	26.72	31.08	31.74	46.00	-14.26 QP
6	948.761	2.08	29.26	26.29	25.54	30.59	46.00	-15.41 QP

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7.9 Radiated Spurious Emissions Above 1GHz

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

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

Measurement Distance: 3m

Limit:

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

7.9.1 E.U.T. Operation

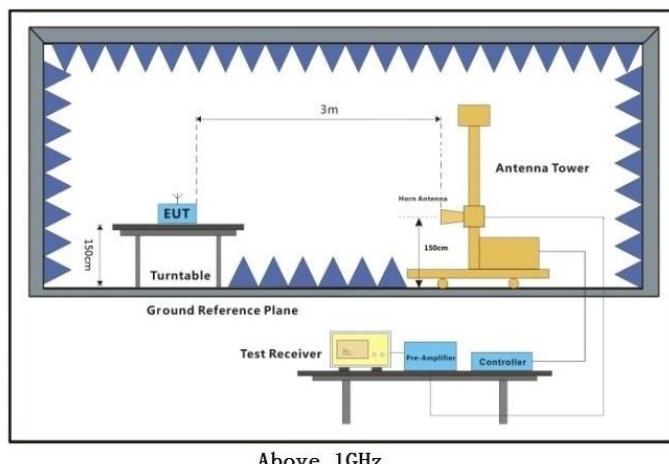
Operating Environment:

Temperature: 23.5 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(Thread)_Keep the EUT in continuously transmitting with O-QPSK modulation mode. Only the data of worst case is recorded in the report
Final test	03	TX mode(Thread+2.4G WiFi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report

7.9.3 Test Setup Diagram



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7.9.4 Measurement Procedure and Data

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

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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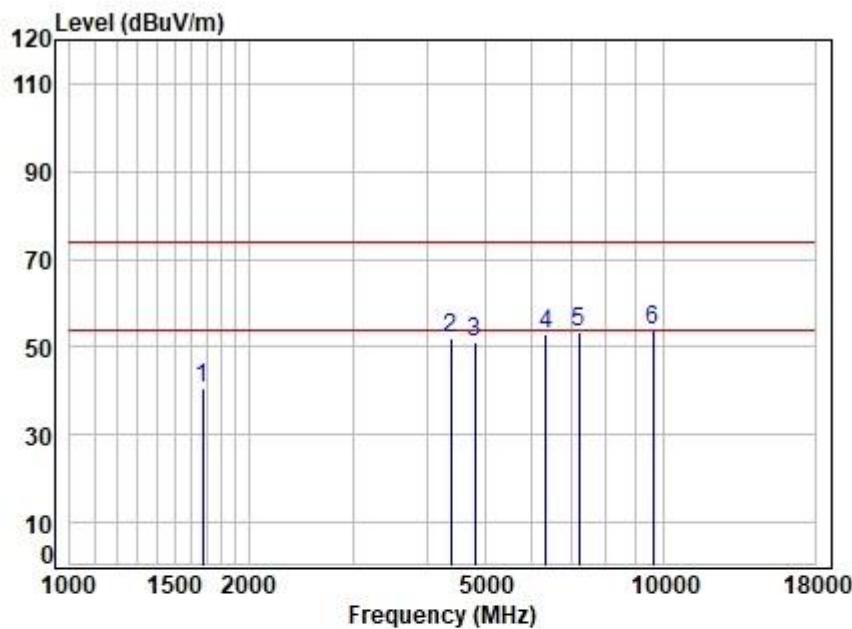
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Test Mode: 03; Polarity: Horizontal; Modulation:O-QPSK+802.11g; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00371AT\00372AT
Mode : 2405 TX RSE
:

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark	
								dB	
1	1672.779	4.14	24.95	52.95	64.67	40.81	74.00	-33.19	peak
2	4392.376	7.47	30.06	52.93	67.60	52.20	74.00	-21.80	peak
3	4810.000	7.99	30.96	53.05	65.26	51.16	74.00	-22.84	peak
4	6340.436	7.68	33.92	53.05	64.27	52.82	74.00	-21.18	peak
5	7215.000	8.30	36.06	53.52	62.34	53.18	74.00	-20.82	peak
6	9620.000	11.40	37.55	53.57	58.28	53.66	74.00	-20.34	peak

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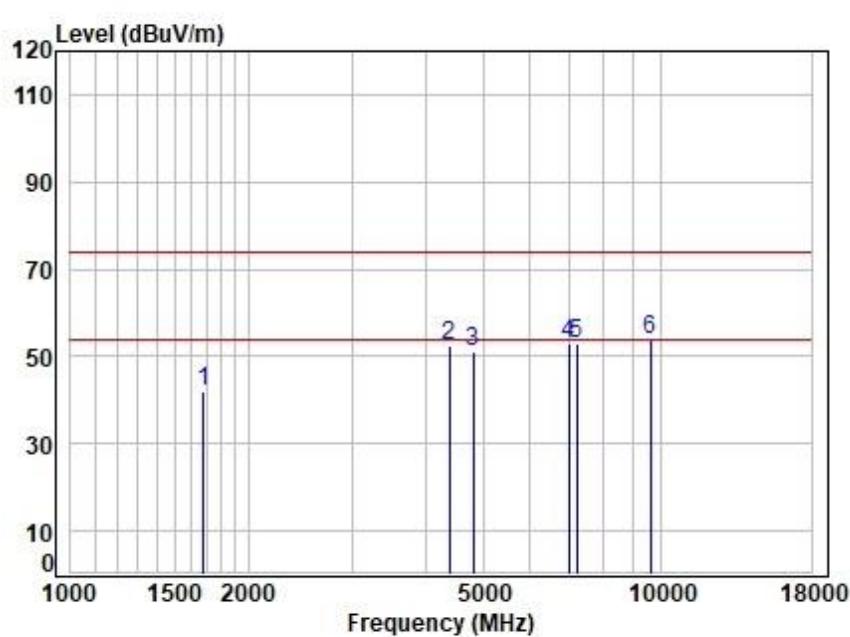
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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00371AT\00372AT
Mode : 2405 TX RSE
:

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Level	Over Line	Over Limit	Remark
				dB	dB/m				
1 1682.477	4.16	24.97	52.95	65.76	65.76	41.94	74.00	-32.06	peak
2 4379.699	7.47	30.04	52.92	68.07	68.07	52.66	74.00	-21.34	peak
3 4810.000	7.99	30.96	53.05	65.15	65.15	51.05	74.00	-22.95	peak
4 6995.172	8.19	35.79	53.50	62.43	62.43	52.91	74.00	-21.09	peak
5 7215.000	8.30	36.06	53.52	61.88	61.88	52.72	74.00	-21.28	peak
6 9620.000	11.40	37.55	53.57	58.39	58.39	53.77	74.00	-20.23	peak

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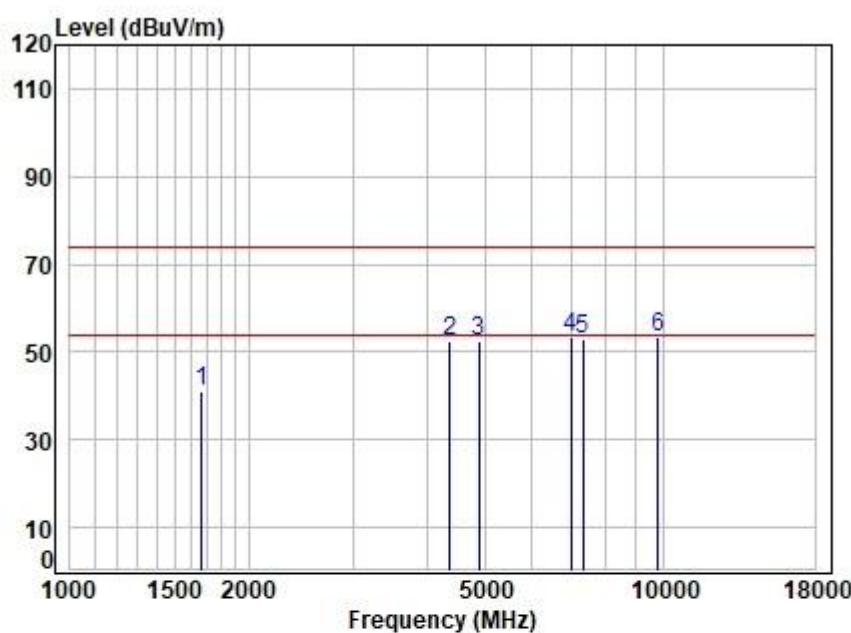
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Test Mode: 03; Polarity: Horizontal; Modulation:O-QPSK+802.11g; Channel: middle



Site : chamber

Condition: 3m HORIZONTAL

Job No : 00371AT\00372AT

Mode : 2445 TX RSE

	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Limit	Remark
Freq	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB

1	1667.951	4.13	24.94	52.94	65.12	41.25	74.00	-32.75 peak
2	4367.058	7.48	30.02	52.92	67.68	52.26	74.00	-21.74 peak
3	4890.000	8.12	31.15	53.07	66.24	52.44	74.00	-21.56 peak
4	6974.982	8.17	35.74	53.48	62.76	53.19	74.00	-20.81 peak
5	7335.000	8.35	36.21	53.54	61.77	52.79	74.00	-21.21 peak
6	9780.000	11.28	37.91	53.41	57.64	53.42	74.00	-20.58 peak

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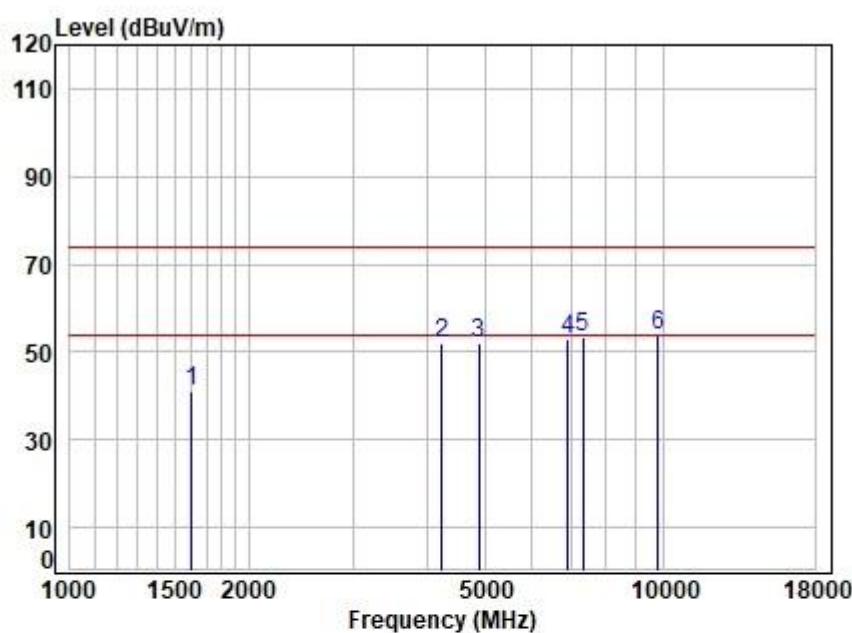
Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

Report No.: FYCR220900037102

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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel: middle



Site : chamber

Condition: 3m VERTICAL

Job No : 00371AT\00372AT

Mode : 2445 TX RSE

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
--	---------------	-------------	------------------	---------------	----------------	--------------	---------------	--------

	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1601.804	3.99	24.80	52.91	65.33	41.21	74.00	-32.79 peak
2	4230.396	7.48	29.83	52.88	67.59	52.02	74.00	-21.98 peak
3	4890.000	8.12	31.15	53.07	65.82	52.02	74.00	-21.98 peak
4	6914.763	8.11	35.60	53.44	62.66	52.93	74.00	-21.07 peak
5	7335.000	8.35	36.21	53.54	62.53	53.55	74.00	-20.45 peak
6	9780.000	11.28	37.91	53.41	58.04	53.82	74.00	-20.18 peak

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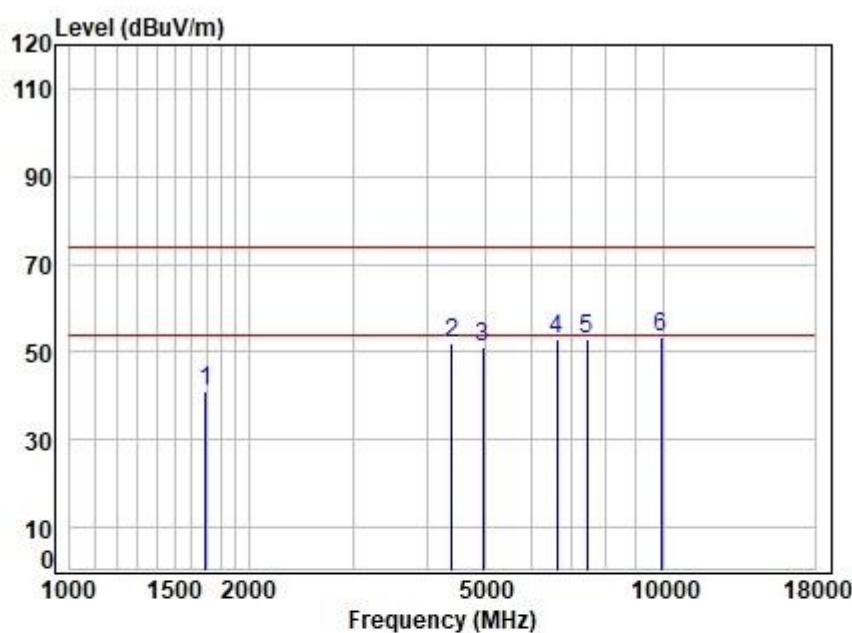
Compliance Certification Services (Kunshan) Inc. Shenzhen Branch

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

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Test Mode: 03; Polarity: Horizontal; Modulation:O-QPSK+802.11g; Channel: High



Site : chamber

Condition: 3m HORIZONTAL

Job No : 00371AT\00372AT

Mode : 2480 TX RSE

:

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark

	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1692.231	4.18	24.99	52.96	64.92	41.13	74.00	-32.87 peak
2	4405.090	7.47	30.07	52.93	67.33	51.94	74.00	-22.06 peak
3	4960.000	8.24	31.31	53.09	64.82	51.28	74.00	-22.72 peak
4	6621.375	7.82	34.90	53.25	63.35	52.82	74.00	-21.18 peak
5	7440.000	8.40	36.33	53.55	61.60	52.78	74.00	-21.22 peak
6	9920.000	11.18	38.22	53.28	57.29	53.41	74.00	-20.59 peak

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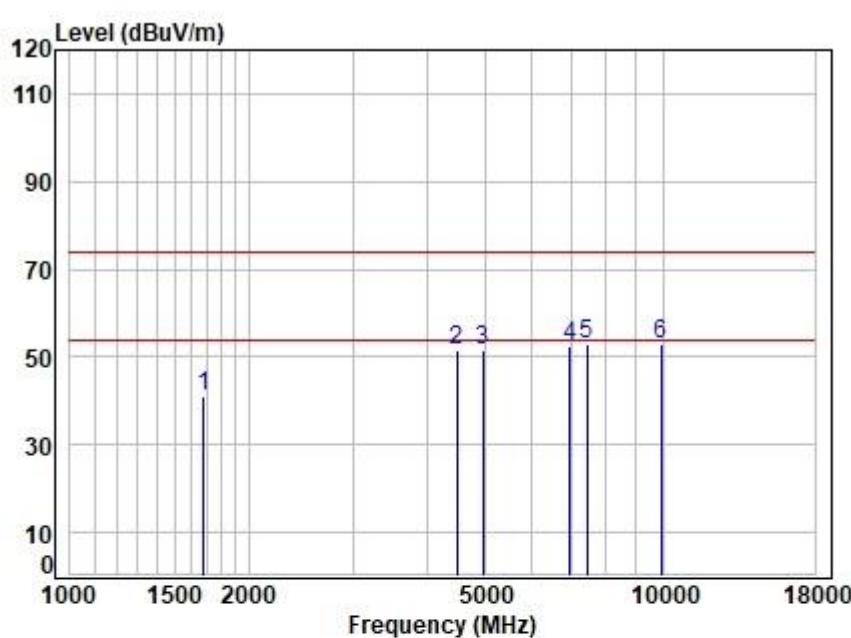
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SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR220900037102

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Test Mode: 03; Polarity: Vertical; Modulation: O-QPSK+802.11g; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 00371AT\00372AT
Mode : 2480 TX RSE
:

Freq	Cable Loss	Ant Factor	Preamp Factor	Read	Limit Line	Over Limit	Remark
				Level			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 1682.477	4.16	24.97	52.95	64.72	40.90	74.00	-33.10 peak
2 4482.150	7.47	30.18	52.95	66.75	51.45	74.00	-22.55 peak
3 4960.000	8.24	31.31	53.09	65.26	51.72	74.00	-22.28 peak
4 6954.852	8.15	35.70	53.47	62.20	52.58	74.00	-21.42 peak
5 7440.000	8.40	36.33	53.55	61.60	52.78	74.00	-21.22 peak
6 9920.000	11.18	38.22	53.28	56.88	53.00	74.00	-21.00 peak



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8 Test Setup Photo

Refer to Setup Photos for FYCR2209000371AT

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for FYCR2209000371AT

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10 Appendix

1. Duty Cycle

1.1 Ant1

1.1.1 Test Result

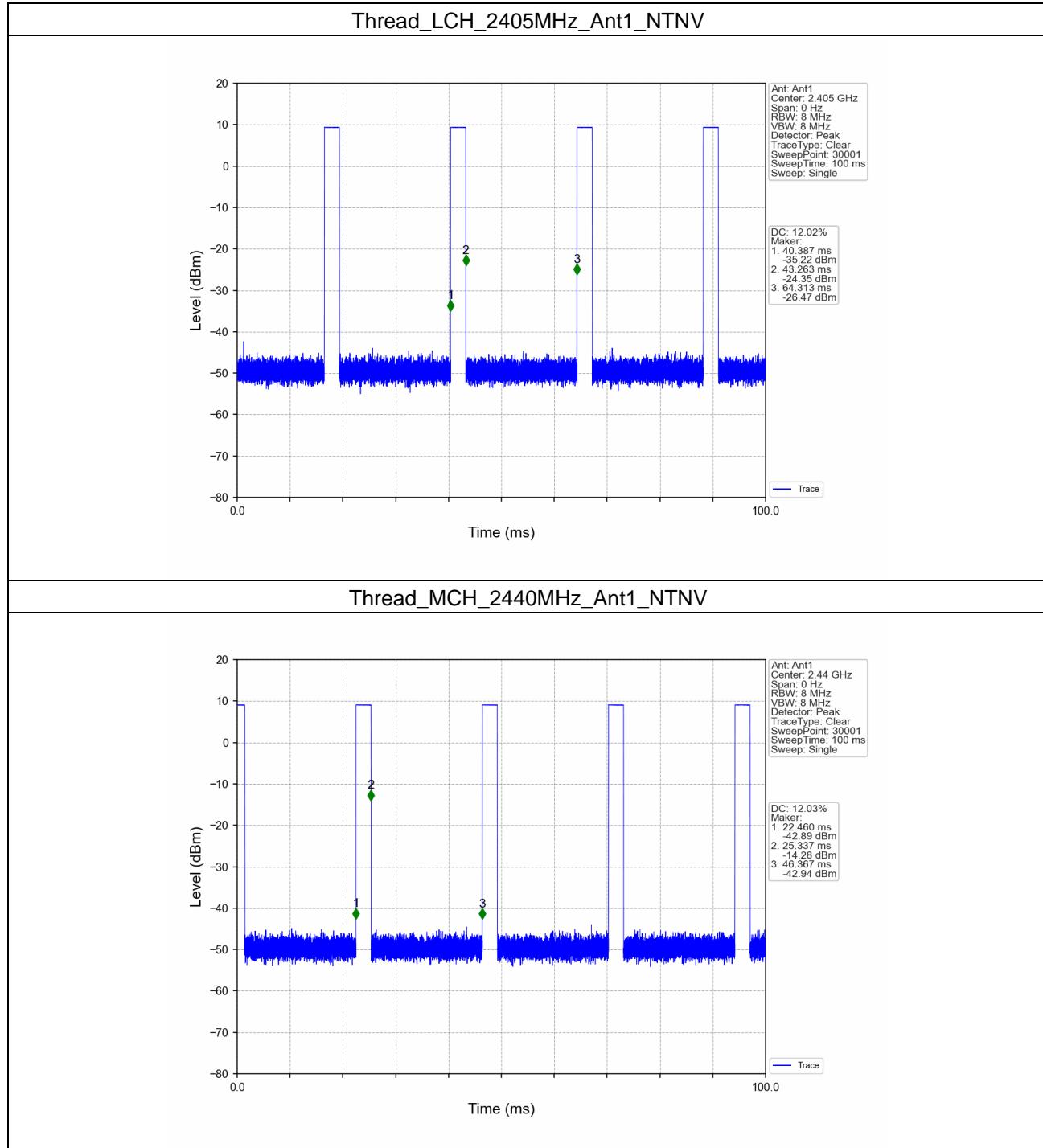
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
Thread	SISO	2405	2.876	23.926	12.02	9.20	0.02
		2440	2.877	23.907	12.03	9.20	0.02
		2480	2.876	23.893	12.04	9.19	0.02



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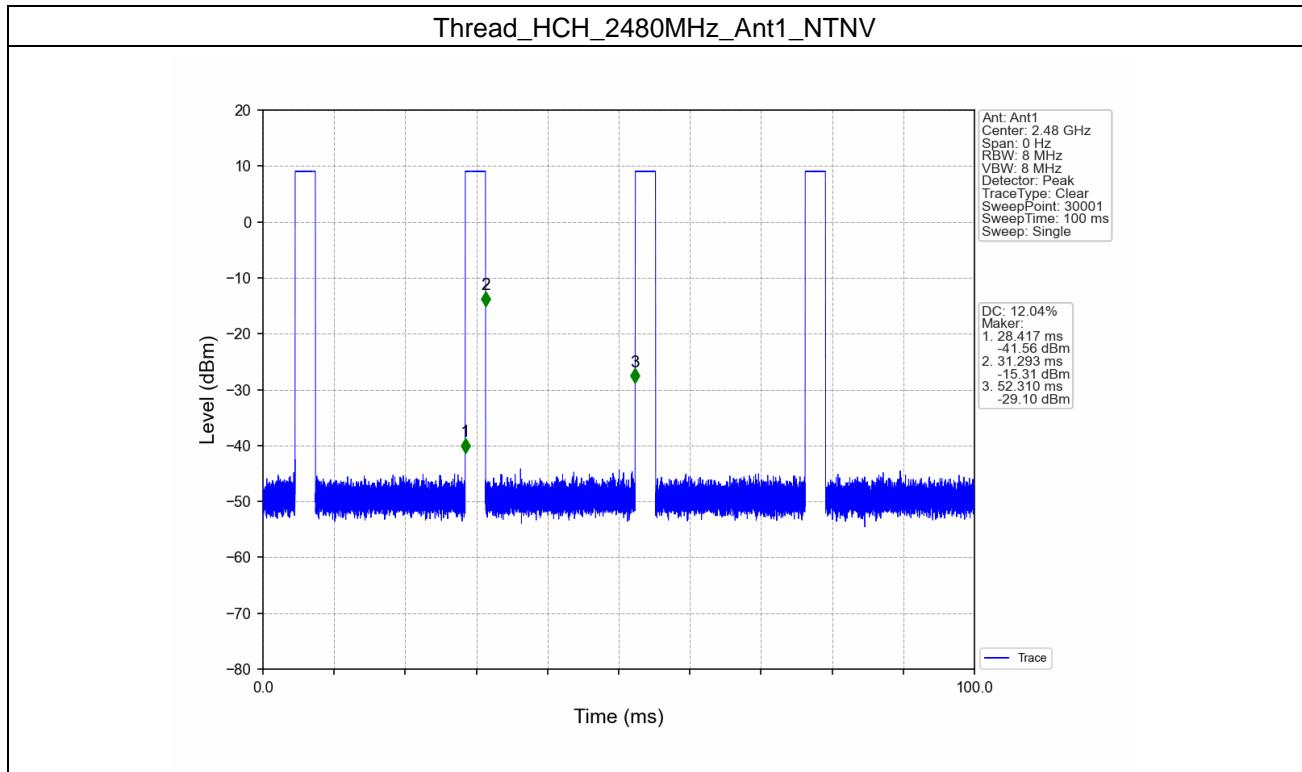
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2. Bandwidth**2.1 OBW****2.1.1 Test Result**

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
Thread	SISO	2405	1	2.241	Pass
		2440	1	2.235	Pass
		2480	1	2.239	Pass



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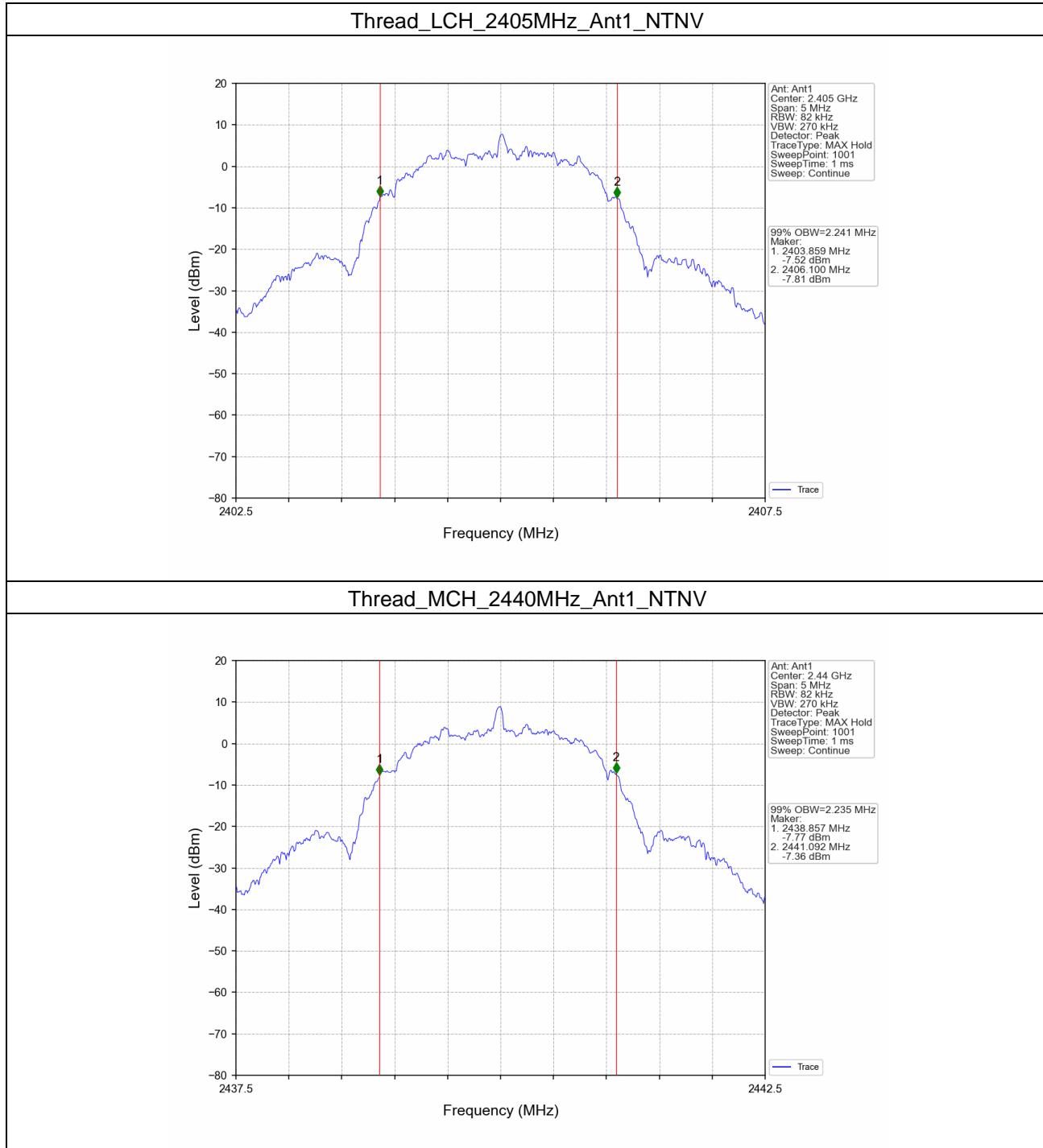
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2.1.2 Test Graph

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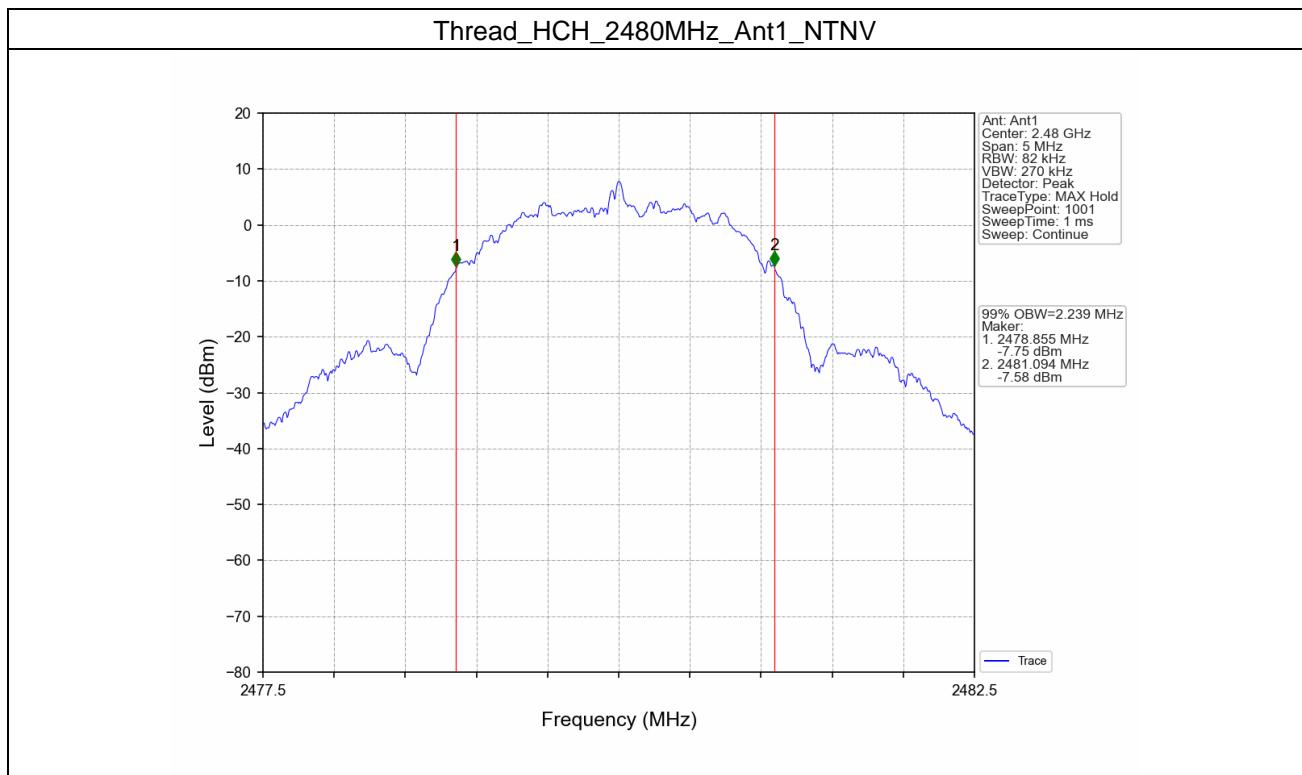
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2.2 6dB BW**2.2.1 Test Result**

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
Thread	SISO	2405	1	1.152	>=0.5	Pass
		2440	1	1.077	>=0.5	Pass
		2480	1	1.073	>=0.5	Pass

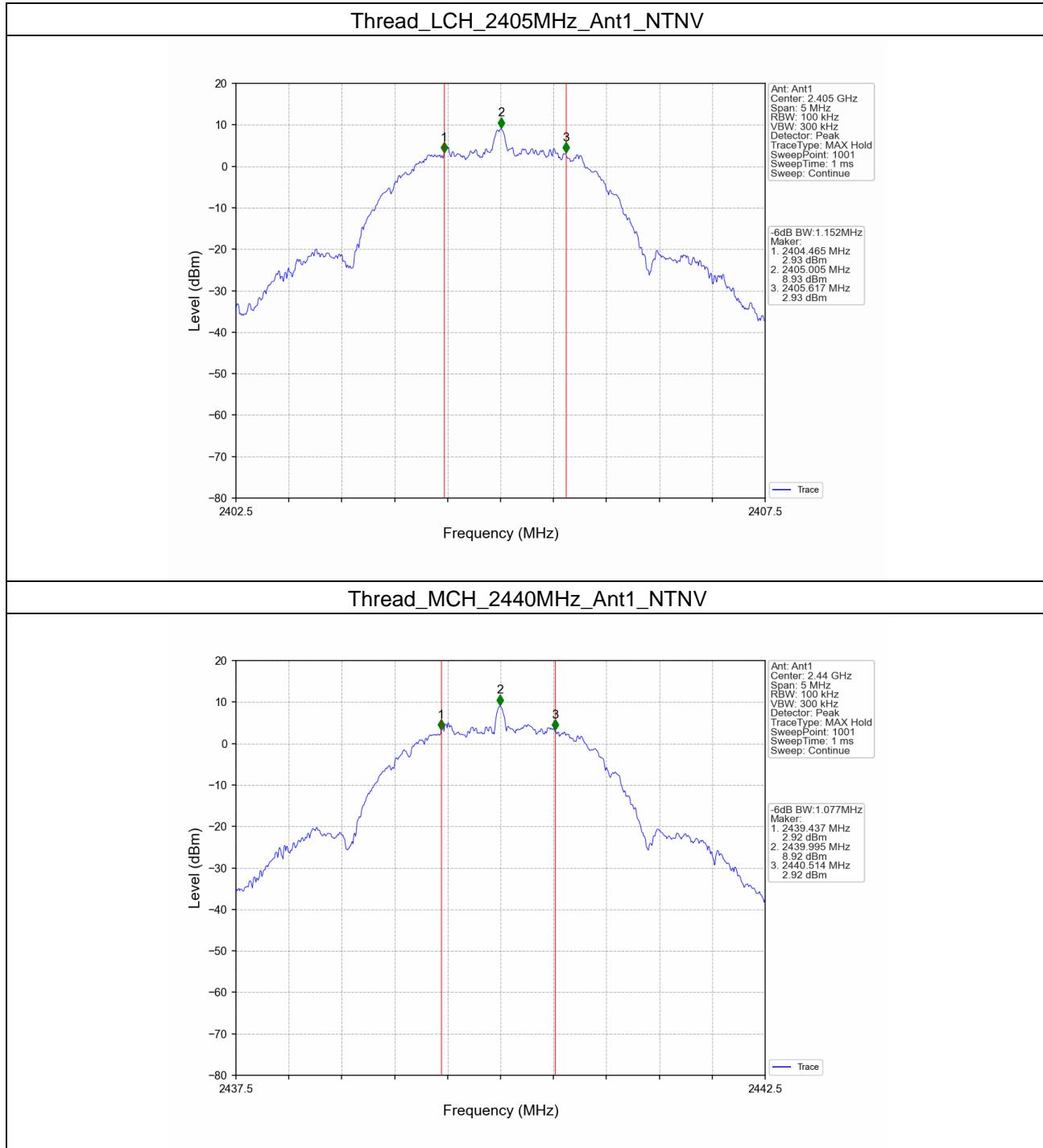
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2.2.2 Test Graph

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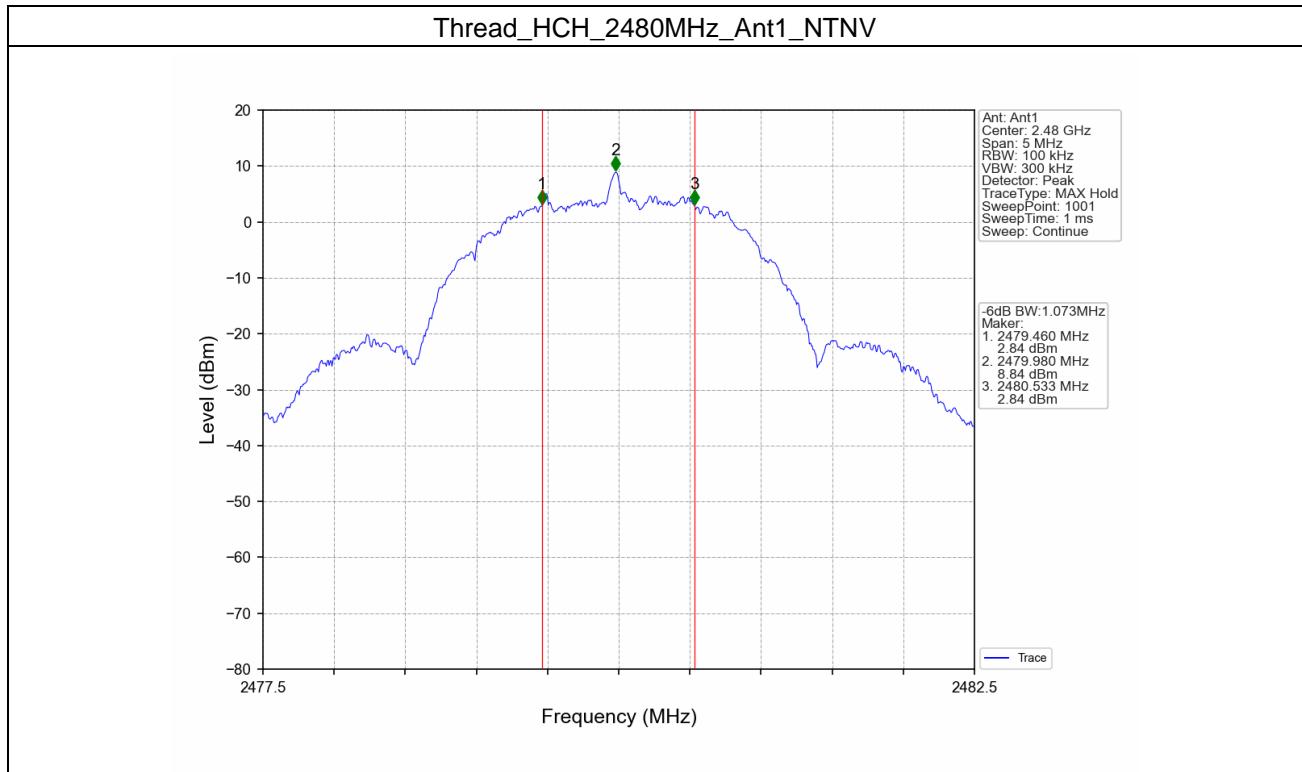
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3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
Thread	SISO	2405	11.67	<=30	Pass
		2440	11.28	<=30	Pass
		2480	11.09	<=30	Pass



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4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

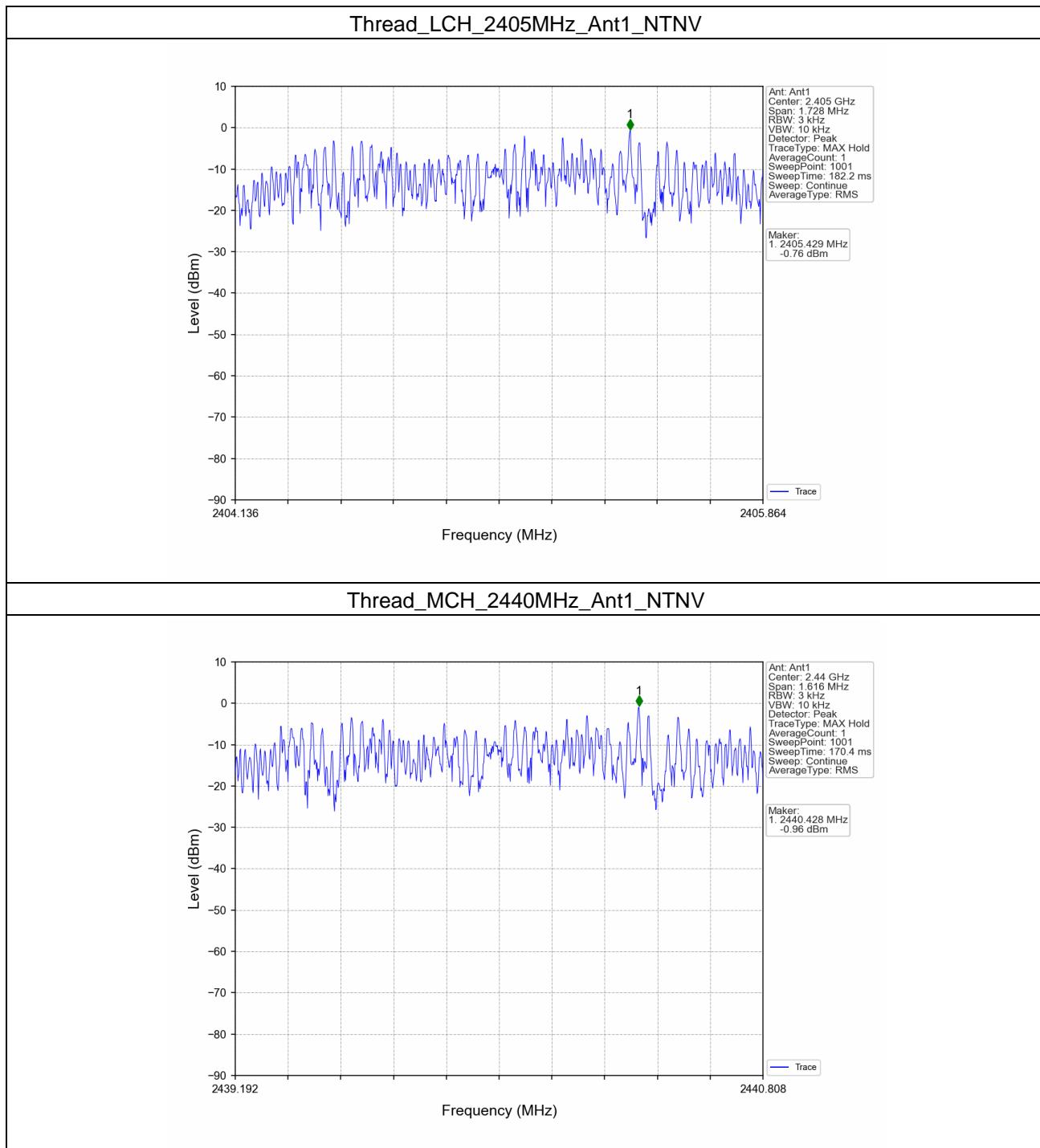
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
Thread	SISO	2405	-0.76	<=8	Pass
		2440	-0.96	<=8	Pass
		2480	-1.47	<=8	Pass

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4.1.2 Test Graph

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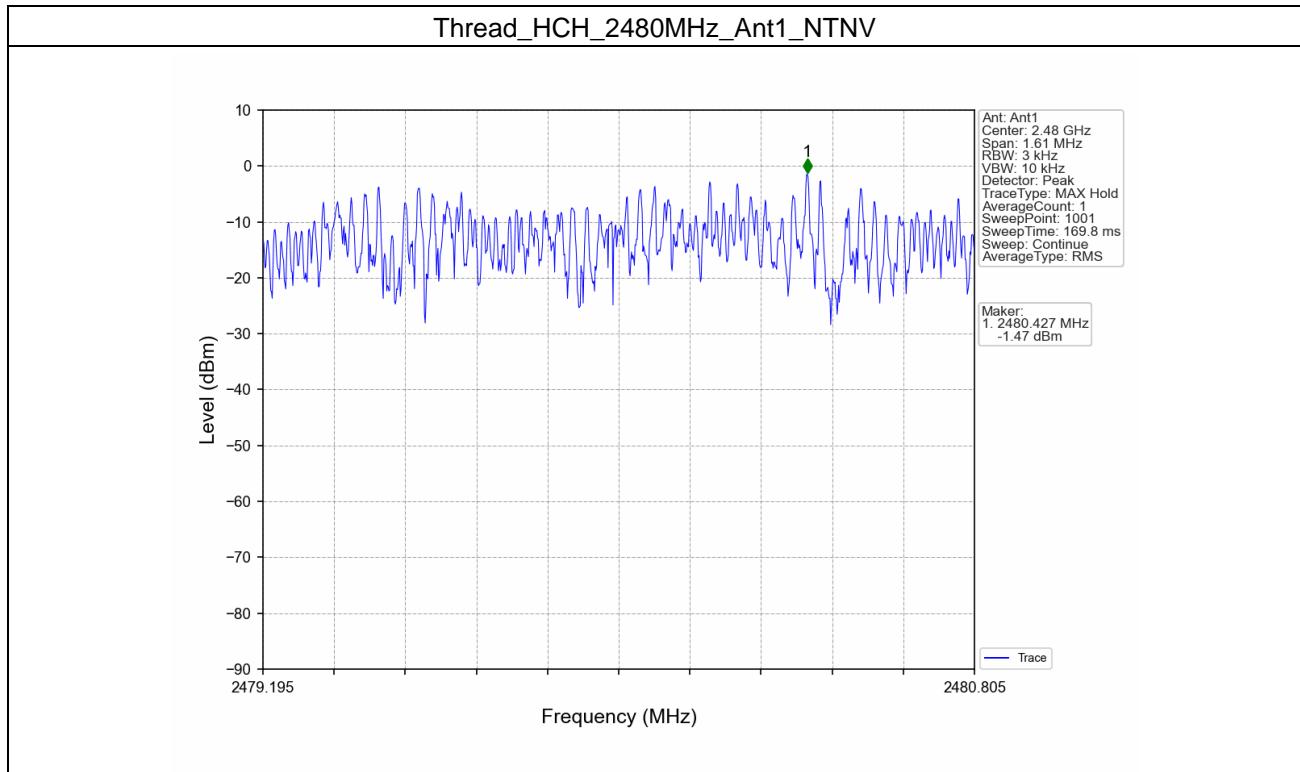
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5. Unwanted Emissions InStandard Non-restricted Frequency Bands

5.1 Ref

5.1.1 Test Result

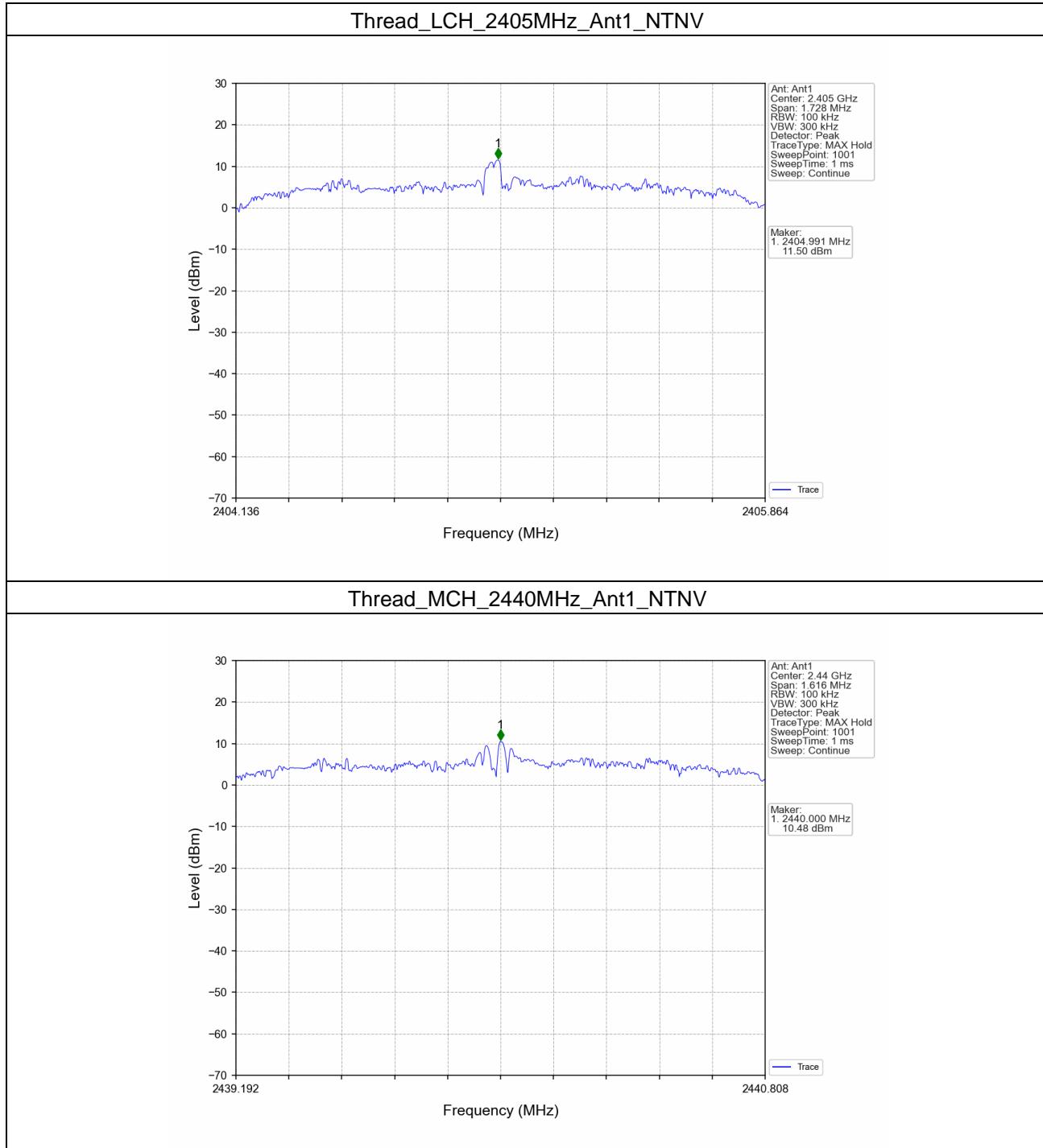
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
Thread	SISO	2405	1	11.50
		2440	1	10.48
		2480	1	10.67



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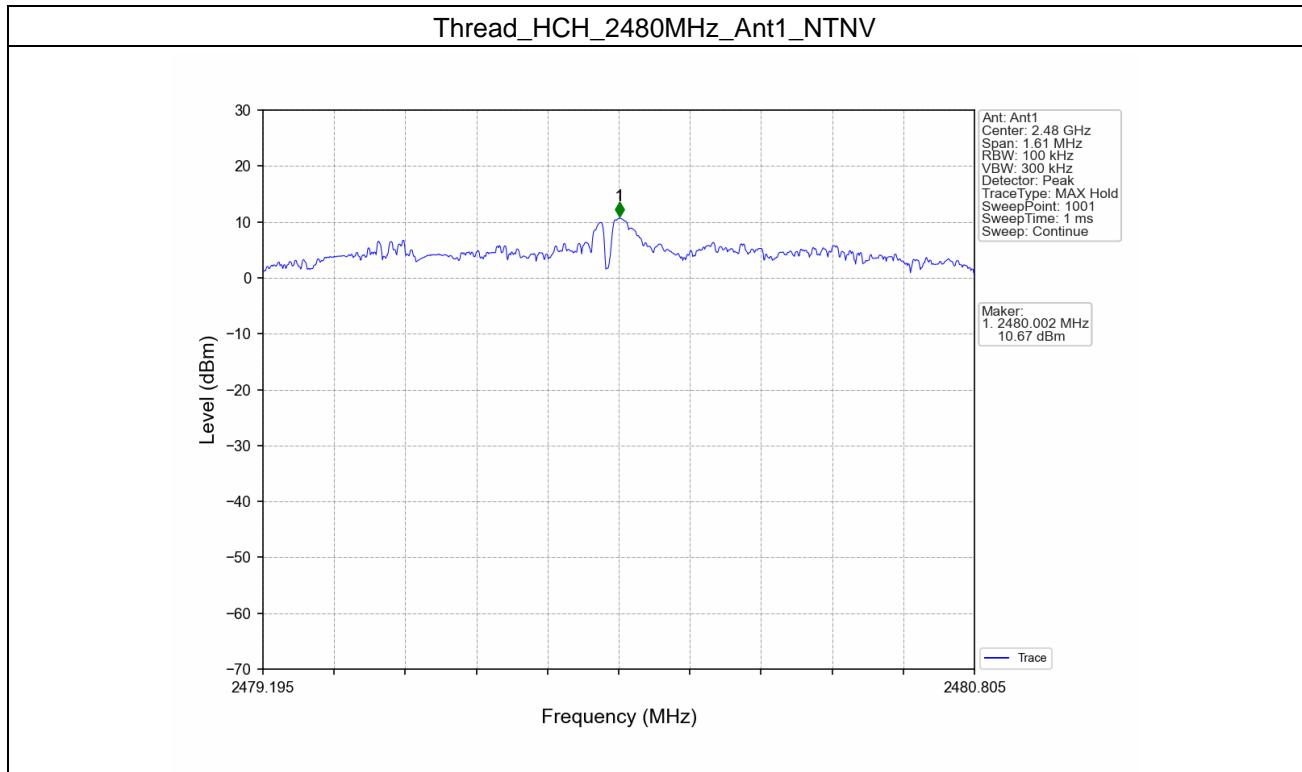
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5.2 CSE**5.2.1 Test Result**

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
Thread	SISO	2405	1	11.50	-8.50	Pass
		2440	1	11.50	-8.50	Pass
		2480	1	11.50	-8.50	Pass

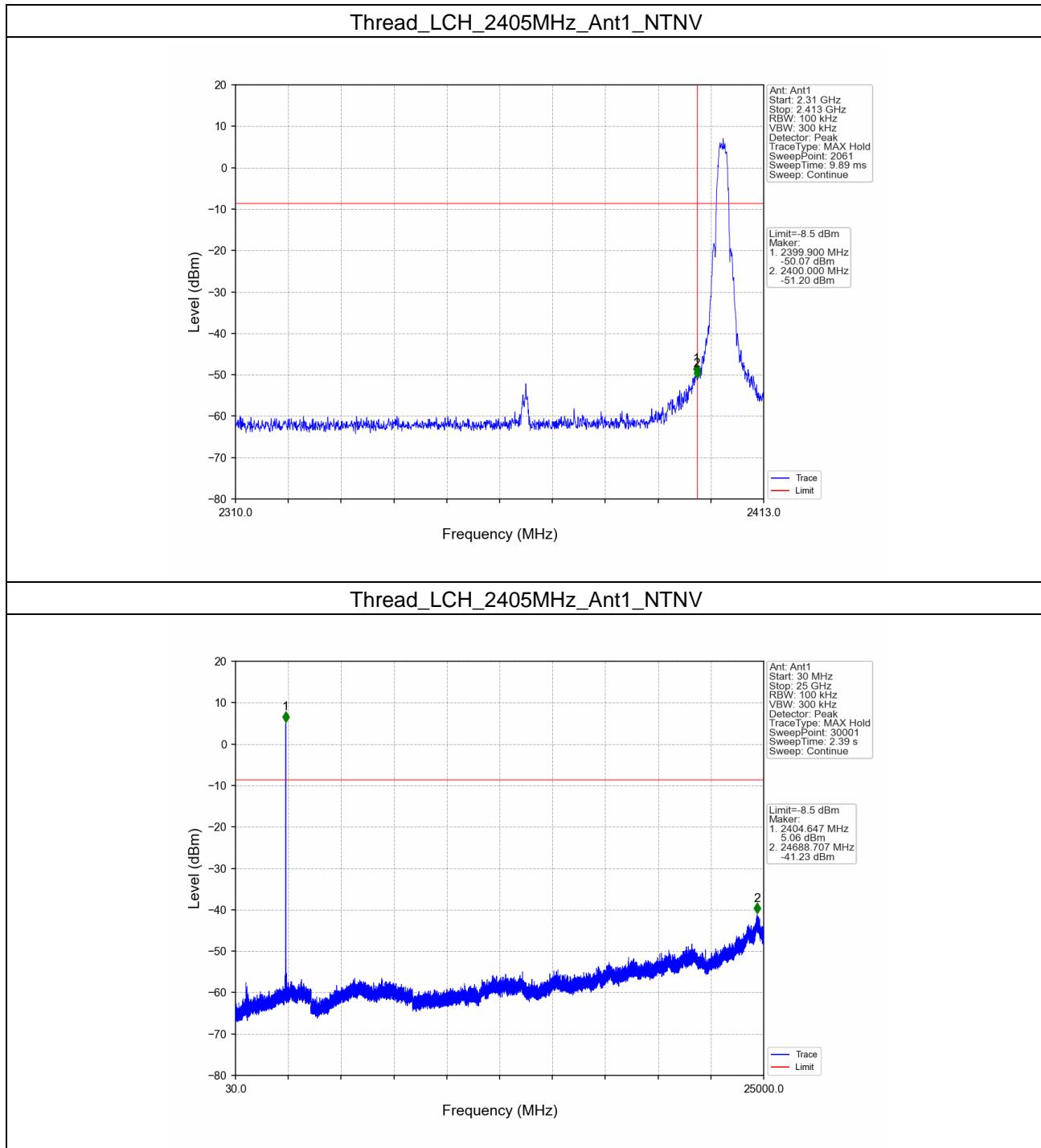


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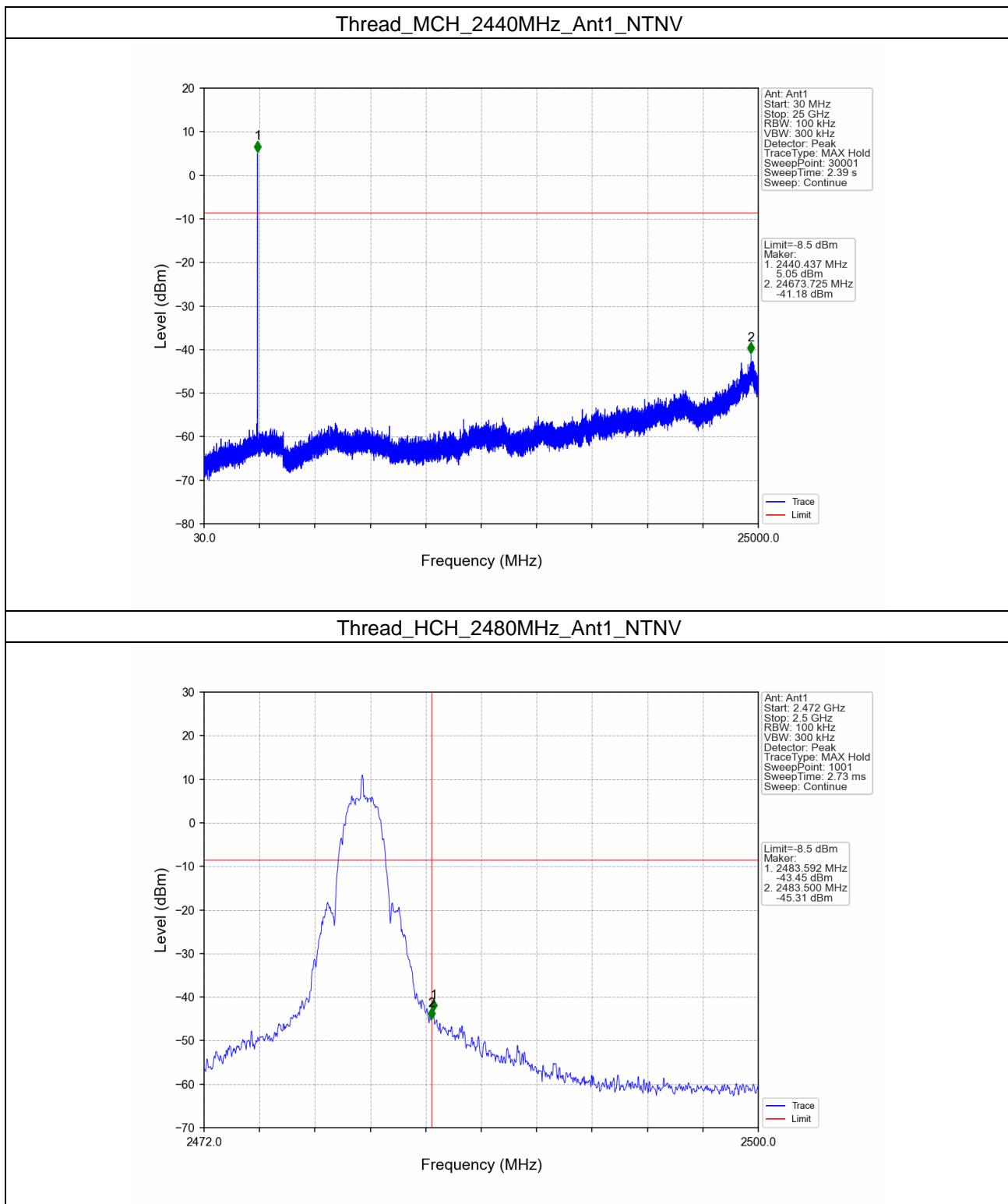
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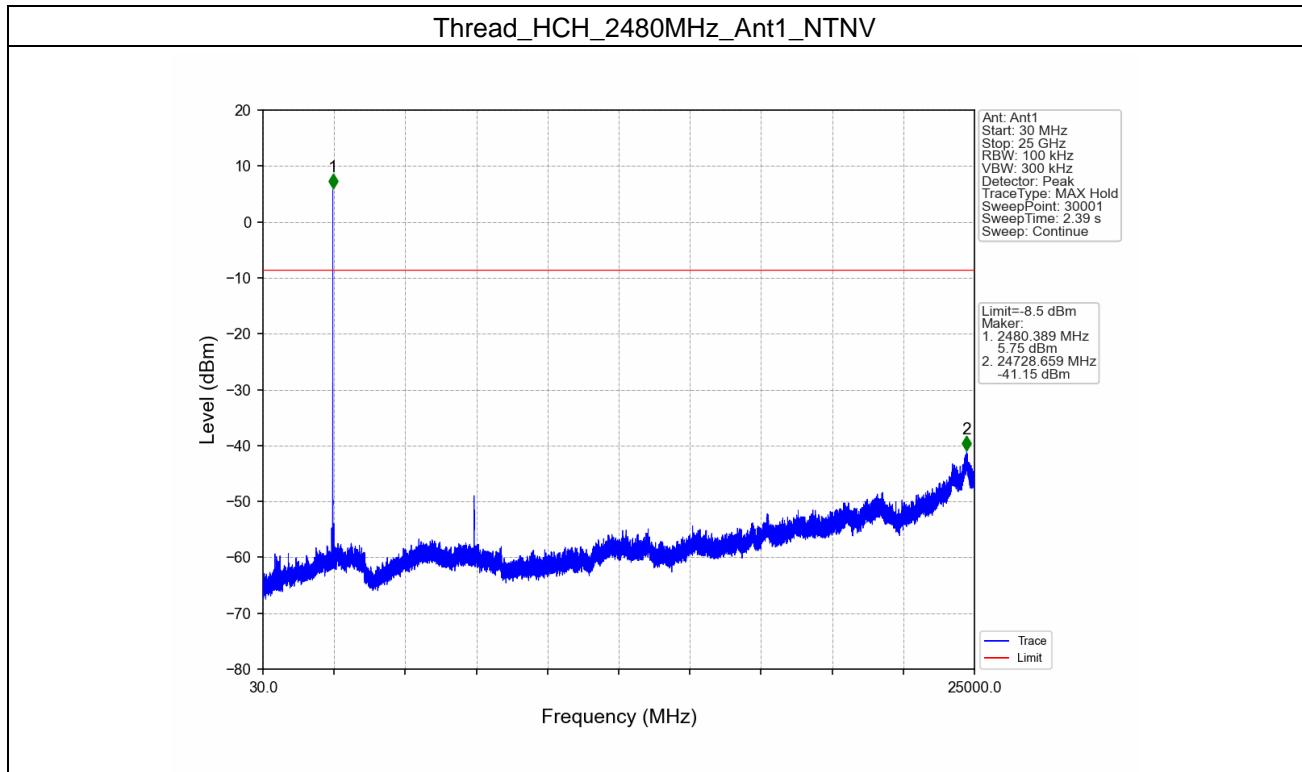
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