RF Test Report

For

Applicant Name:	**UBRIDGE Co., Ltd.**
Address:	1-1704, Ace Hightech City, 775, Gyeongin-ro, Yeongdeungpo-gu, Seoul, South Korea
EUT Name:	Android dongle
Brand Name:	N/A
Model Number:	MG-S03

Issued By

Company Name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number:	BTF230626R00402
Test Standards:	47 CFR Part 15.247
Test Conclusion:	Pass
FCC ID:	2AWC3-MG-S03
Test Date:	2023-06-26 to 2023-07-13
Date of Issue:	2023-07-20
Prepared By:	Elma.Yang
	elma.yang / Project Engineer
Date:	2023-07-20
Approved By:	Ryan.CJ
	Ryan.CJ / EMC Manager
Date:	2023-07-20

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-07-20	Original
Note: Once the revision has been made, then previous versions reports are invalid.		

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1 Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Announcement

(1) The test report reference to the report template version v0.
(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
(3) The test report is invalid if there is any evidence and/or falsification.
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2 Product Information

2.1 Application Information

Company Name:	UBRIDGE Co., Ltd.
Address:	1-1704, Ace Hightech City, 775, Gyeongin-ro, Yeongdeungpo-gu, Seoul, South Korea

2.2 Manufacturer Information

Company Name:	Shenzhen Tomato Technology Co., Ltd
Address:	Room 1106, Huatong Building, SunGangDong Road, LuoHu District, Shenzhen, Guangdong Province, P.R.China 518022.

2.3 Factory Information

Company Name:	Shenzhen Tomato Technology Co., Ltd
Address:	Room 1106, Huatong Building, SunGangDong Road, LuoHu District, Shenzhen, Guangdong Province, P.R.China 518022.

2.4 General Description of Equipment under Test (EUT)

EUT Name:	Android dongle
Test Model Number:	MG-S03

2.5 Technical Information

Power Supply:	DC 5V from adapter
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz; 802.11n(HT40): 2422MHz to 2452MHz
Number of Channels:	802.11b/g/n(HT20): 11 Channels; 802.11n(HT40): 7 Channels
Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type:	Shrapnel antenna
Antenna Gain#:	2.14 dBi
Note: #: The antenna gain provided by the applicant, and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.	

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3 Summary of Test Results

3.1 Test Standards

The tests were performed according to following standards:
47 CFR Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

3.2 Uncertainty of Test

Item	Measurement Uncertainty
Conducted Emission (150 kHz-30 MHz)	±2.64dB
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3.3 Summary of Test Result

Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.247	47 CFR 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	Pass
Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.247(a)(2)	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(3)	Pass
Power Spectral Density	47 CFR Part 15.247	47 CFR 15.247(e)	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Emissions in restricted frequency bands (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Emissions in restricted frequency bands (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass

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4 Test Configuration

4.1 Test Equipment List

Conducted Emission at AC power line					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	2022-11-24	2023-11-23
Coaxial Switcher	SCHWARZBECK	CX210	CX210	2022-11-24	2023-11-23
V-LISN	SCHWARZBECK	NSLK 8127	01073	2022-11-24	2023-11-23
LISN	AFJ	LS16/110VAC	16010020076	2023-02-23	2024-02-22
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2022-11-24	2023-11-23

Occupied Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Maximum Conducted Output Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Power Spectral Density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**

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RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Emissions in non-restricted frequency bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Band edge emissions (Radiated)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023-03-24	2024-03-23
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23

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SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2023-03-24	2024-03-23
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2021-11-28	2023-11-27

Emissions in restricted frequency bands (below 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023-03-24	2024-03-23
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2023-03-24	2024-03-23
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2021-11-28	2023-11-27

Emissions in restricted frequency bands (above 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023-03-24	2024-03-23
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23

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RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2023-03-24	2024-03-23
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2021-11-28	2023-11-27

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4.2 Test Auxiliary Equipment

The EUT was tested as an independent device.

4.3 Test Modes

No.	Test Modes	Description
TM1	802.11b mode	Keep the EUT in 802.11b transmitting mode.
TM2	802.11g mode	Keep the EUT in 802.11g transmitting mode.
TM3	802.11n(HT20) mode	Keep the EUT in 802.11n(HT20) transmitting mode.
TM4	802.11n(HT40) mode	Keep the EUT in 802.11n(HT40) transmitting mode.

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5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test 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 shall be considered sufficient to comply with the provisions of this section.

6 Radio Spectrum Matter Test Results (RF)

6.1 Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).
Test Method:	ANSI C63.10-2013 section 6.2 ANSI C63.10-2020 section 6.2
Test Limit:	Frequency of emission (MHz) / Conducted limit (dBμV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 *Decreases with the logarithm of the frequency.
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices

6.1.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25 °C
Humidity:	51.1 %
Atmospheric Pressure:	1010 mbar

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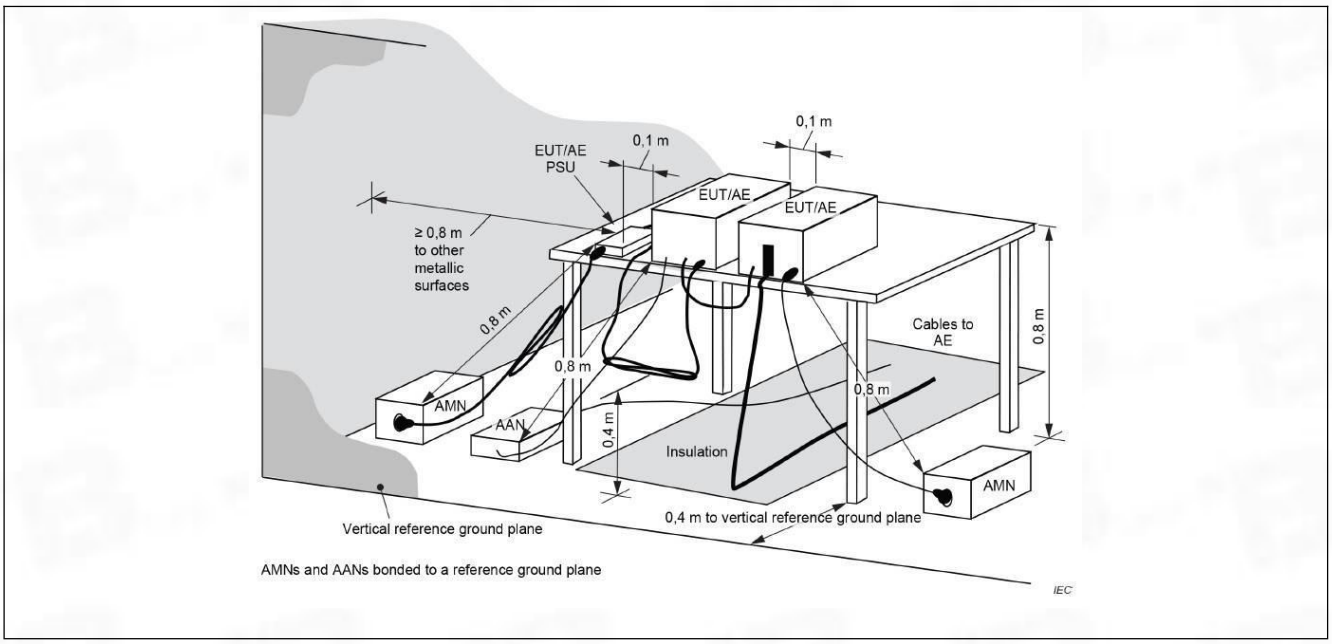
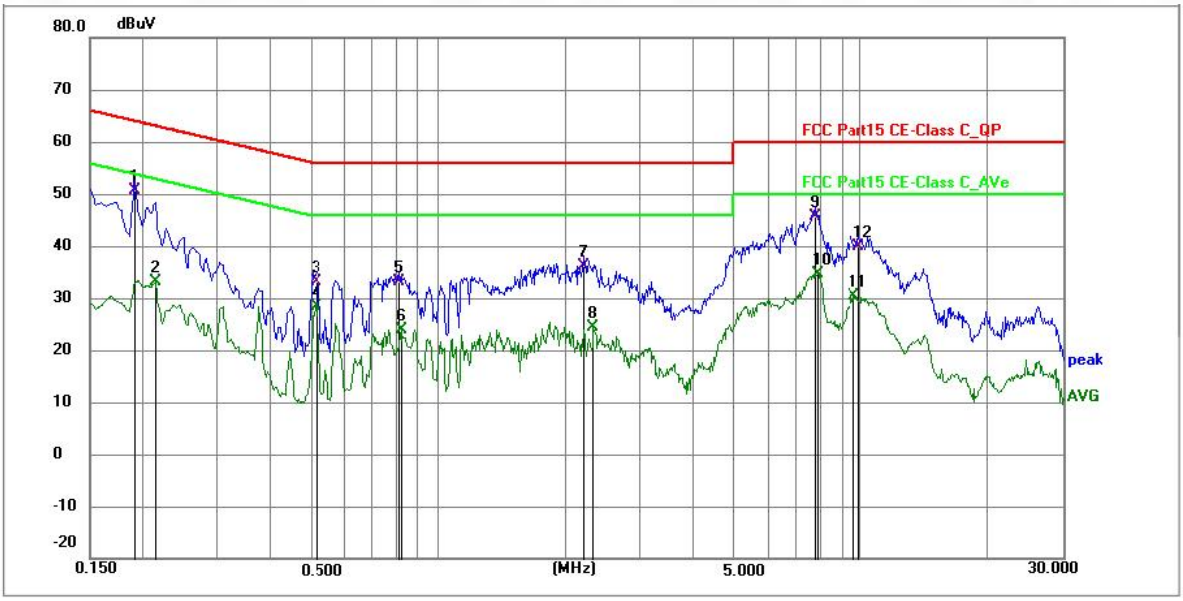
6.1.2 Test Setup Diagram:



6.1.3 Test Data:

TM1 / Line: Line / Band: 2.4G / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1905	40.00	10.60	50.60	64.01	-13.41	QP	P	
2	0.2130	22.39	10.63	33.02	53.09	-20.07	AVG	P	
3	0.5127	22.48	10.62	33.10	56.00	-22.90	QP	P	
4	0.5127	17.65	10.62	28.27	46.00	-17.73	AVG	P	
5	0.8114	22.35	10.75	33.10	56.00	-22.90	QP	P	
6	0.8205	13.23	10.75	23.98	46.00	-22.02	AVG	P	
7	2.2110	26.46	9.64	36.10	56.00	-19.90	QP	P	
8	2.3325	15.29	9.03	24.32	46.00	-21.68	AVG	P	
9	7.8000	34.90	10.80	45.70	60.00	-14.30	QP	P	
10	7.8855	23.73	10.80	34.53	50.00	-15.47	AVG	P	
11	9.6000	19.49	10.93	30.42	50.00	-19.58	AVG	P	
12	9.9060	28.95	10.95	39.90	60.00	-20.10	QP	P	

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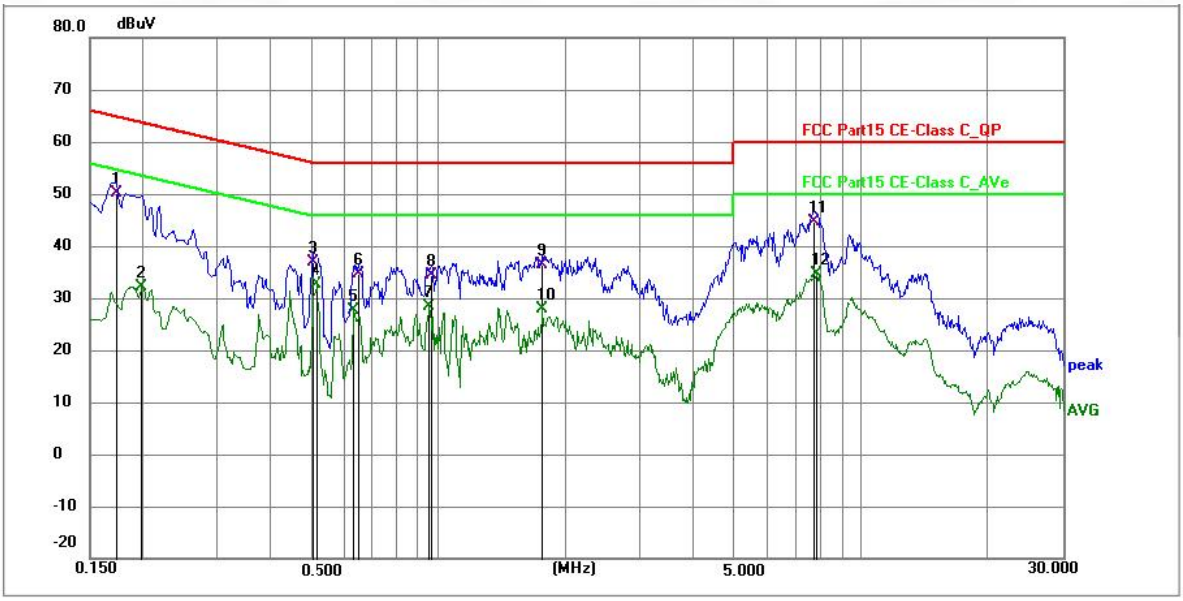
TM1 / Line: Neutral / Band: 2.4G / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1723	39.55	10.55	50.10	64.85	-14.75	QP	P	
2	0.1985	21.38	10.63	32.01	53.67	-21.66	AVG	P	
3	0.5050	26.29	10.61	36.90	56.00	-19.10	QP	P	
4 *	0.5141	22.10	10.62	32.72	46.00	-13.28	AVG	P	
5	0.6310	16.93	10.69	27.62	46.00	-18.38	AVG	P	
6	0.6491	23.91	10.69	34.60	56.00	-21.40	QP	P	
7	0.9555	17.65	10.77	28.42	46.00	-17.58	AVG	P	
8	0.9645	23.63	10.77	34.40	56.00	-21.60	QP	P	
9	1.7655	25.59	10.71	36.30	56.00	-19.70	QP	P	
10	1.7655	17.21	10.71	27.92	46.00	-18.08	AVG	P	
11	7.7054	33.81	10.79	44.60	60.00	-15.40	QP	P	
12	7.8494	23.74	10.80	34.54	50.00	-15.46	AVG	P	

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6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Method:	ANSI C63.10-2013, section 11.8 ANSI C63.10-2020, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW >= [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. 11.8.1 Option 1 The steps for the first option are as follows: a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. b) Set the VBW ≥ [3 × RBW]. c) Detector = peak. d) Trace mode = max-hold. e) Sweep = No faster than coupled (auto) time. f) Allow the trace to stabilize. g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “−6 dB down amplitude”. If a marker is below this “−6 dB down amplitude” value, then it shall be as close as possible to this value. 11.8.2 Option 2 The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

6.2.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.3 °C
Humidity:	53.8 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Data:

Please Refer to Appendix for Details.

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6.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Method:	ANSI C63.10-2013, section 11.9.1 ANSI C63.10-2020 section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power ANSI C63.10-2020, section 11.9.1 Maximum peak conducted output power

6.3.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.3 °C
Humidity:	53.8 %
Atmospheric Pressure:	1010 mbar

6.3.2 Test Data:

Please Refer to Appendix for Details.

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6.4 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Method:	ANSI C63.10-2013, section 11.10 ANSI C63.10-2020, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission ANSI C63.10-2020, section 11.10, Maximum power spectral density level in the fundamental emission

6.4.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.3 °C
Humidity:	53.8 %
Atmospheric Pressure:	1010 mbar

6.4.2 Test Data:

Please Refer to Appendix for Details.

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6.5 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d)
Test Method:	ANSI C63.10-2013 section 11.11 ANSI C63.10-2020 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(d), 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.
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3 ANSI C63.10-2020 Section 11.11.1, Section 11.11.2, Section 11.11.3

6.5.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.3 °C
Humidity:	53.8 %
Atmospheric Pressure:	1010 mbar

6.5.2 Test Data:

Please Refer to Appendix for Details.

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6.6 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`
Test Method:	ANSI C63.10-2013 section 6.10 ANSI C63.10-2020 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Test 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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

Procedure:	ANSI C63.10-2013 section 6.10.5.2 ANSI C63.10-2020 section 6.10.5.2

6.6.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25 °C
Humidity:	51.1 %
Atmospheric Pressure:	1010 mbar

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6.6.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	66.98	-30.59	36.39	74.00	-37.61	peak	P
2	2390.000	68.21	-30.49	37.72	74.00	-36.28	peak	P
3 *	2400.000	78.01	-30.48	47.53	74.00	-26.47	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	67.98	-30.59	37.39	74.00	-36.61	peak	P
2	2390.000	67.21	-30.49	36.72	74.00	-37.28	peak	P
3 *	2400.000	76.51	-30.48	46.03	74.00	-27.97	peak	P

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	80.46	-30.39	50.07	74.00	-23.93	peak	P
2	2500.000	73.55	-30.37	43.18	74.00	-30.82	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	79.96	-30.39	49.57	74.00	-24.43	peak	P
2	2500.000	72.05	-30.37	41.68	74.00	-32.32	peak	P

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TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	67.76	-30.59	37.17	74.00	-36.83	peak	P
2	2390.000	72.29	-30.49	41.80	74.00	-32.20	peak	P
3 *	2400.000	83.09	-30.48	52.61	74.00	-21.39	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	67.76	-30.59	37.17	74.00	-36.83	peak	P
2	2390.000	71.79	-30.49	41.30	74.00	-32.70	peak	P
3 *	2400.000	83.09	-30.48	52.61	74.00	-21.39	peak	P

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	78.91	-30.39	48.52	74.00	-25.48	peak	P
2	2500.000	71.89	-30.37	41.52	74.00	-32.48	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	77.41	-30.39	47.02	74.00	-26.98	peak	P
2	2500.000	72.39	-30.37	42.02	74.00	-31.98	peak	P

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TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	68.76	-30.59	38.17	74.00	-35.83	peak	P
2	2390.000	77.53	-30.49	47.04	74.00	-26.96	peak	P
3 *	2400.000	79.36	-30.48	48.88	74.00	-25.12	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	68.26	-30.59	37.67	74.00	-36.33	peak	P
2	2390.000	79.03	-30.49	48.54	74.00	-25.46	peak	P
3 *	2400.000	81.36	-30.48	50.88	74.00	-23.12	peak	P

TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	80.12	-30.39	49.73	74.00	-24.27	peak	P
2	2500.000	74.37	-30.37	44.00	74.00	-30.00	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	79.12	-30.39	48.73	74.00	-25.27	peak	P
2	2500.000	73.87	-30.37	43.50	74.00	-30.50	peak	P

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TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	67.25	-30.59	36.66	74.00	-37.34	peak	P
2	2390.000	74.57	-30.49	44.08	74.00	-29.92	peak	P
3 *	2400.000	84.02	-30.48	53.54	74.00	-20.46	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	66.25	-30.59	35.66	74.00	-38.34	peak	P
2	2390.000	74.07	-30.49	43.58	74.00	-30.42	peak	P
3 *	2400.000	83.02	-30.48	52.54	74.00	-21.46	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	82.13	-30.39	51.74	74.00	-22.26	peak	P
2	2500.000	72.63	-30.37	42.26	74.00	-31.74	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	79.13	-30.39	48.74	74.00	-25.26	peak	P
2	2500.000	70.63	-30.37	40.26	74.00	-33.74	peak	P

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6.7 Emissions in restricted frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`
Test Method:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02
Test 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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

Procedure:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4

6.7.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25 °C
Humidity:	51.1 %
Atmospheric Pressure:	1010 mbar

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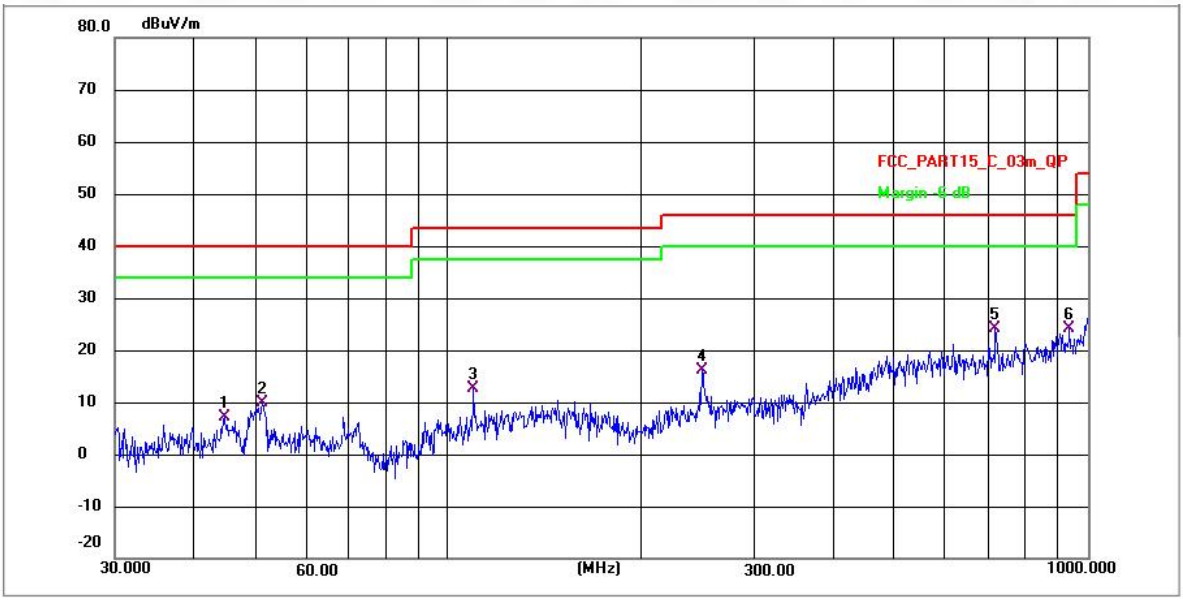
6.7.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	44.4308	27.48	-20.43	7.05	40.00	-32.95	QP	P
2	51.0314	30.11	-20.30	9.81	40.00	-30.19	QP	P
3	109.6036	40.66	-28.14	12.52	43.50	-30.98	QP	P
4	249.4250	41.88	-25.85	16.03	46.00	-29.97	QP	P
5 *	719.1995	47.72	-23.65	24.07	46.00	-21.93	QP	P
6	938.8326	45.85	-21.84	24.01	46.00	-21.99	QP	P

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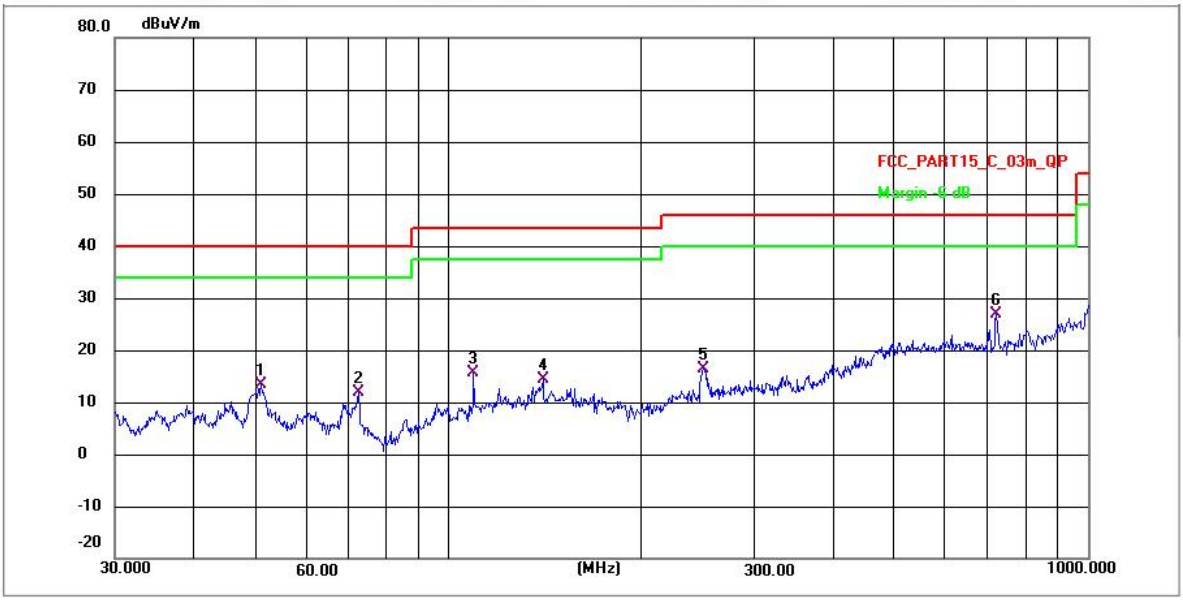
TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	50.8528	33.66	-20.31	13.35	40.00	-26.65	QP	P
2	72.3376	31.87	-19.95	11.92	40.00	-28.08	QP	P
3	109.6036	43.73	-28.14	15.59	43.50	-27.91	QP	P
4	140.5884	42.14	-27.87	14.27	43.50	-29.23	QP	P
5	250.7404	42.33	-25.84	16.49	46.00	-29.51	QP	P
6 *	720.4616	50.57	-23.66	26.91	46.00	-19.09	QP	P

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6.8 Emissions in restricted frequency bands (above 1GHz)

Test Requirement:	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)).`
Test Method:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02
Test 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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

Procedure:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4

6.8.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25 °C
Humidity:	51.1 %
Atmospheric Pressure:	1010 mbar

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6.8.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1480.488	80.97	-29.11	51.86	74.00	-22.14	peak	P
2	4814.742	80.59	-26.54	54.05	74.00	-19.95	peak	P
3	4814.751	75.53	-26.54	48.99	54.00	-5.01	AVG	P
4	7230.044	77.36	-24.70	52.66	74.00	-21.34	peak	P
5	8104.045	75.56	-23.15	52.41	74.00	-21.59	peak	P
6	10102.755	70.36	-20.97	49.39	74.00	-24.61	peak	P
7	14102.318	66.88	-15.94	50.94	74.00	-23.06	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1349.388	81.81	-28.67	53.14	74.00	-20.86	peak	P
2	4683.642	81.43	-26.10	55.33	74.00	-18.67	peak	P
3	4683.641	72.98	-25.10	47.88	54.00	-6.12	AVG	P
4	7098.944	78.20	-24.26	53.94	74.00	-20.06	peak	P
5	7972.945	76.40	-22.71	53.69	74.00	-20.31	peak	P
6	9971.655	71.20	-20.53	50.67	74.00	-23.33	peak	P
7	13971.218	67.72	-15.50	52.22	74.00	-21.78	peak	P

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1348.378	84.10	-28.30	55.80	74.00	-18.20	peak	P
2	1348.384	77.52	-28.31	49.21	54.00	-4.79	AVG	P
3	4682.632	83.72	-25.73	57.99	74.00	-16.01	peak	P
4	4682.621	72.96	-25.71	47.25	54.00	-6.75	AVG	P
5	7097.934	80.49	-23.89	56.60	74.00	-17.40	peak	P
6	7097.934	70.21	-23.88	46.33	54.00	-7.67	AVG	P
7	7971.935	78.69	-22.34	56.35	74.00	-17.65	peak	P
8	7971.925	68.50	-22.35	46.15	54.00	-7.85	AVG	P
9	9970.645	73.49	-20.16	53.33	74.00	-20.67	peak	P
10	13970.208	70.01	-15.13	54.88	74.00	-19.12	peak	P
11	13970.211	58.71	-15.16	43.55	54.00	-10.45	AVG	P

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TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1634.598	82.29	-28.61	53.68	74.00	-20.32	peak	P
2	4968.852	81.91	-26.04	55.87	74.00	-18.13	peak	P
3	4968.851	73.71	-26.05	47.66	54.00	-6.34	AVG	P
4	7384.154	78.68	-24.20	54.48	74.00	-19.52	peak	P
5	7384.154	68.19	-24.21	43.98	54.00	-10.02	AVG	P
6	8258.155	76.88	-22.65	54.23	74.00	-19.77	peak	P
7	8258.166	65.80	-22.65	43.15	54.00	-10.85	AVG	P
8	10256.865	71.68	-20.47	51.21	74.00	-22.79	peak	P
9	14256.428	68.20	-15.44	52.76	74.00	-21.24	peak	P

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1521.478	82.92	-28.68	54.24	74.00	-19.76	peak	P
2	1521.471	76.92	-28.67	48.25	54.00	-5.75	AVG	P
3	4855.732	82.54	-26.11	56.43	74.00	-17.57	peak	P
4	4855.731	77.40	-26.14	51.26	54.00	-2.74	AVG	P
5	7271.034	79.31	-24.27	55.04	74.00	-18.96	peak	P
6	7271.024	74.10	-23.22	50.88	54.00	-3.12	AVG	P
7	8145.035	77.51	-22.72	54.79	74.00	-19.21	peak	P
8	8145.024	71.92	-22.71	49.21	54.00	-4.79	AVG	P
9	10143.745	72.31	-20.54	51.77	74.00	-22.23	peak	P
10	14143.308	68.83	-15.51	53.32	74.00	-20.68	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1424.778	82.67	-28.75	53.92	74.00	-20.08	peak	P
2	4759.032	82.29	-26.18	56.11	74.00	-17.89	peak	P
3	4759.011	75.42	-26.17	49.25	54.00	-4.75	AVG	P
4	7174.334	79.06	-24.34	54.72	74.00	-19.28	peak	P
5	7174.334	70.53	-24.31	46.22	54.00	-7.78	AVG	P
6	8048.335	77.26	-22.79	54.47	74.00	-19.53	peak	P
7	8048.331	69.32	-22.78	46.54	54.00	-7.46	AVG	P
8	10047.045	72.06	-20.61	51.45	74.00	-22.55	peak	P
9	14046.608	68.58	-15.58	53.00	74.00	-21.00	peak	P

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TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1459.438	83.70	-29.38	54.32	74.00	-19.68	peak	P
2	1459.421	73.46	-29.31	44.15	54.00	-9.85	AVG	P
3	4793.692	83.32	-26.81	56.51	74.00	-17.49	peak	P
4	4793.692	73.07	-26.82	46.25	54.00	-7.75	AVG	P
5	7208.994	80.09	-24.97	55.12	74.00	-18.88	peak	P
6	7208.995	70.07	-24.85	45.22	54.00	-8.78	AVG	P
7	8082.995	78.29	-23.42	54.87	74.00	-19.13	peak	P
8	8082.954	69.39	-23.41	45.98	54.00	-8.02	AVG	P
9	10081.705	73.09	-21.24	51.85	74.00	-22.15	peak	P
10	14081.268	69.61	-16.21	53.40	74.00	-20.60	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1353.818	82.92	-29.59	53.33	74.00	-20.67	peak	P
2	4688.072	82.54	-27.02	55.52	74.00	-18.48	peak	P
3	4688.071	72.22	-27.01	45.21	54.00	-8.79	AVG	P
4	7103.374	79.31	-25.18	54.13	74.00	-19.87	peak	P
5	7103.374	69.29	-25.18	44.11	54.00	-9.89	AVG	P
6	7977.375	77.51	-23.63	53.88	74.00	-20.12	peak	P
7	9976.085	72.31	-21.45	50.86	74.00	-23.14	peak	P
8	13975.648	68.83	-16.42	52.41	74.00	-21.59	peak	P

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TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1704.448	82.97	-29.54	53.43	74.00	-20.57	peak	P
2	5038.702	82.59	-26.97	55.62	74.00	-18.38	peak	P
3	5038.700	72.85	-26.97	45.88	54.00	-8.12	AVG	P
4	7454.004	79.36	-25.13	54.23	74.00	-19.77	peak	P
5	7454.004	70.11	-25.14	44.97	54.00	-9.03	AVG	P
6	8328.005	77.56	-23.58	53.98	74.00	-20.02	peak	P
7	10326.715	72.36	-21.40	50.96	74.00	-23.04	peak	P
8	14326.278	68.88	-16.37	52.51	74.00	-21.49	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1371.408	81.97	-29.46	52.51	74.00	-21.49	peak	P
2	4705.662	81.59	-26.89	54.70	74.00	-19.30	peak	P
3	4705.661	71.13	-26.88	44.25	54.00	-9.75	AVG	P
4	7120.964	78.36	-25.05	53.31	74.00	-20.69	peak	P
5	7994.965	76.56	-23.50	53.06	74.00	-20.94	peak	P
6	9993.675	71.36	-21.32	50.04	74.00	-23.96	peak	P
7	13993.238	67.88	-16.29	51.59	74.00	-22.41	peak	P

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1867.268	81.26	-28.33	52.93	74.00	-21.07	peak	P
2	5201.522	80.88	-25.76	55.12	74.00	-18.88	peak	P
3	5201.522	71.53	-25.71	45.82	54.00	-8.18	AVG	P
4	7616.824	77.65	-23.92	53.73	74.00	-20.27	peak	P
5	8490.825	75.85	-22.37	53.48	74.00	-20.52	peak	P
6	10489.535	70.65	-20.19	50.46	74.00	-23.54	peak	P
7	14489.098	67.17	-15.16	52.01	74.00	-21.99	peak	P

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TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1681.518	81.73	-28.63	53.10	74.00	-20.90	peak	P
2	5015.772	81.35	-26.06	55.29	74.00	-18.71	peak	P
3	5015.771	71.96	-26.08	45.88	54.00	-8.12	AVG	P
4	7431.074	78.12	-24.22	53.90	74.00	-20.10	peak	P
5	8305.075	76.32	-22.67	53.65	74.00	-20.35	peak	P
6	10303.785	71.12	-20.49	50.63	74.00	-23.37	peak	P
7	14303.348	67.64	-15.46	52.18	74.00	-21.82	peak	P

TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1570.388	81.33	-29.09	52.24	74.00	-21.76	peak	P
2	4904.642	80.95	-26.52	54.43	74.00	-19.57	peak	P
3	4904.641	71.42	-26.51	44.91	54.00	-9.09	AVG	P
4	7319.944	77.72	-24.68	53.04	74.00	-20.96	peak	P
5	8193.945	75.92	-23.13	52.79	74.00	-21.21	peak	P
6	10192.655	70.72	-20.95	49.77	74.00	-24.23	peak	P
7	14192.218	67.24	-15.92	51.32	74.00	-22.68	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1349.708	80.37	-29.33	51.04	74.00	-22.96	peak	P
2	4683.962	79.99	-26.76	53.23	74.00	-20.77	peak	P
3	7099.264	76.76	-24.92	51.84	74.00	-22.16	peak	P
4	7973.265	74.96	-23.37	51.59	74.00	-22.41	peak	P
5	9971.975	69.76	-21.19	48.57	74.00	-25.43	peak	P
6	13971.538	66.28	-16.16	50.12	74.00	-23.88	peak	P

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TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1463.448	81.96	-29.27	52.69	74.00	-21.31	peak	P
2	4797.702	81.58	-26.70	54.88	74.00	-19.12	peak	P
3	4797.701	71.63	-26.70	44.93	54.00	-9.07	AVG	P
4	7213.004	78.35	-24.86	53.49	74.00	-20.51	peak	P
5	8087.005	76.55	-23.31	53.24	74.00	-20.76	peak	P
6	10085.715	71.35	-21.13	50.22	74.00	-23.78	peak	P
7	14085.278	67.87	-16.10	51.77	74.00	-22.23	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1354.758	81.18	-29.61	51.57	74.00	-22.43	peak	P
2	4689.012	80.80	-27.04	53.76	74.00	-20.24	peak	P
3	7104.314	77.57	-25.20	52.37	74.00	-21.63	peak	P
4	7978.315	75.77	-23.65	52.12	74.00	-21.88	peak	P
5	9977.025	70.57	-21.47	49.10	74.00	-24.90	peak	P
6	13976.588	67.09	-16.44	50.65	74.00	-23.35	peak	P

TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1493.818	80.56	-29.57	50.99	74.00	-23.01	peak	P
2	4828.072	80.18	-27.00	53.18	74.00	-20.82	peak	P
3	7243.374	76.95	-25.16	51.79	74.00	-22.21	peak	P
4	8117.375	75.15	-23.61	51.54	74.00	-22.46	peak	P
5	10116.085	69.95	-21.43	48.52	74.00	-25.48	peak	P
6	14115.648	66.47	-16.40	50.07	74.00	-23.93	peak	P

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TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1661.428	81.40	-29.57	51.83	74.00	-22.17	peak	P
2	4995.682	81.02	-27.00	54.02	74.00	-19.98	peak	P
3	4995.681	75.04	-27.16	47.88	54.00	-6.12	AVG	P
4	7410.984	77.79	-25.16	52.63	74.00	-21.37	peak	P
5	8284.985	75.99	-23.61	52.38	74.00	-21.62	peak	P
6	10283.695	70.79	-21.43	49.36	74.00	-24.64	peak	P
7	14283.258	67.31	-16.40	50.91	74.00	-23.09	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1593.388	82.23	-28.94	53.29	74.00	-20.71	peak	P
2	4927.642	81.85	-26.37	55.48	74.00	-18.52	peak	P
3	4927.641	73.49	-26.27	47.22	54.00	-6.78	AVG	P
4	7342.944	78.62	-24.53	54.09	74.00	-19.91	peak	P
5	7342.955	71.36	-24.51	46.85	54.00	-7.15	AVG	P
6	8216.945	76.82	-22.98	53.84	74.00	-20.16	peak	P
7	10215.655	71.62	-20.80	50.82	74.00	-23.18	peak	P
8	14215.218	68.14	-15.77	52.37	74.00	-21.63	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1493.488	78.97	-29.05	49.92	74.00	-24.08	peak	P
2	4827.742	78.59	-26.48	52.11	74.00	-21.89	peak	P
3	7243.044	75.36	-24.64	50.72	74.00	-23.28	peak	P
4	8117.045	73.56	-23.09	50.47	74.00	-23.53	peak	P
5	10115.755	68.36	-20.91	47.45	74.00	-26.55	peak	P
6	14115.318	64.88	-15.88	49.00	74.00	-25.00	peak	P

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TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1671.408	80.29	-29.00	51.29	74.00	-22.71	peak	P
2	5005.662	79.91	-26.43	53.48	74.00	-20.52	peak	P
3	7420.964	76.68	-24.59	52.09	74.00	-21.91	peak	P
4	8294.965	74.88	-23.04	51.84	74.00	-22.16	peak	P
5	10293.675	69.68	-20.86	48.82	74.00	-25.18	peak	P
6	14293.238	66.20	-15.83	50.37	74.00	-23.63	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: M

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1633.238	80.96	-28.59	52.37	74.00	-21.63	peak	P
2	4967.492	80.58	-26.02	54.56	74.00	-19.44	peak	P
3	4967.481	75.19	-26.04	49.15	54.00	-4.85	AVG	P
4	7382.794	77.35	-24.18	53.17	74.00	-20.83	peak	P
5	8256.795	75.55	-22.63	52.92	74.00	-21.08	peak	P
6	10255.505	70.35	-20.45	49.90	74.00	-24.10	peak	P
7	14255.068	66.87	-15.42	51.45	74.00	-22.55	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1483.688	83.95	-27.12	56.83	74.00	-17.17	peak	P
2	1483.687	75.28	-27.13	48.15	54.00	-5.85	AVG	P
3	4817.942	83.57	-24.55	59.02	74.00	-14.98	peak	P
4	4817.941	74.21	-24.55	49.66	54.00	-4.34	AVG	P
5	7233.244	80.34	-22.71	57.63	74.00	-16.37	peak	P
6	7233.251	70.54	-22.72	47.82	54.00	-6.18	AVG	P
7	8107.245	78.54	-21.16	57.38	74.00	-16.62	peak	P
8	8107.251	68.43	-21.18	47.25	54.00	-6.75	AVG	P
9	10105.955	73.34	-18.98	54.36	74.00	-19.64	peak	P
10	10105.951	62.59	-18.91	43.68	54.00	-10.32	AVG	P
11	14105.518	69.86	-13.95	55.91	74.00	-18.09	peak	P
12	14105.514	59.94	-13.95	45.99	54.00	-8.01	AVG	P

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TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1352.748	83.60	-28.36	55.24	74.00	-18.76	peak	P
2	1352.748	76.46	-28.31	48.15	54.00	-5.85	AVG	P
3	4687.002	83.22	-25.79	57.43	74.00	-16.57	peak	P
4	4681.001	75.03	-25.78	49.25	54.00	-4.75	AVG	P
5	7102.304	79.99	-23.95	56.04	74.00	-17.96	peak	P
6	7102.415	72.16	-23.94	48.22	54.00	-5.78	AVG	P
7	7976.305	78.19	-22.40	55.79	74.00	-18.21	peak	P
8	7976.304	70.05	-22.43	47.62	54.00	-6.38	AVG	P
9	9975.015	72.99	-20.22	52.77	74.00	-21.23	peak	P
10	13974.578	69.51	-15.19	54.32	74.00	-19.68	peak	P
11	13857.257	60.42	-15.17	45.25	54.00	-8.75	AVG	P

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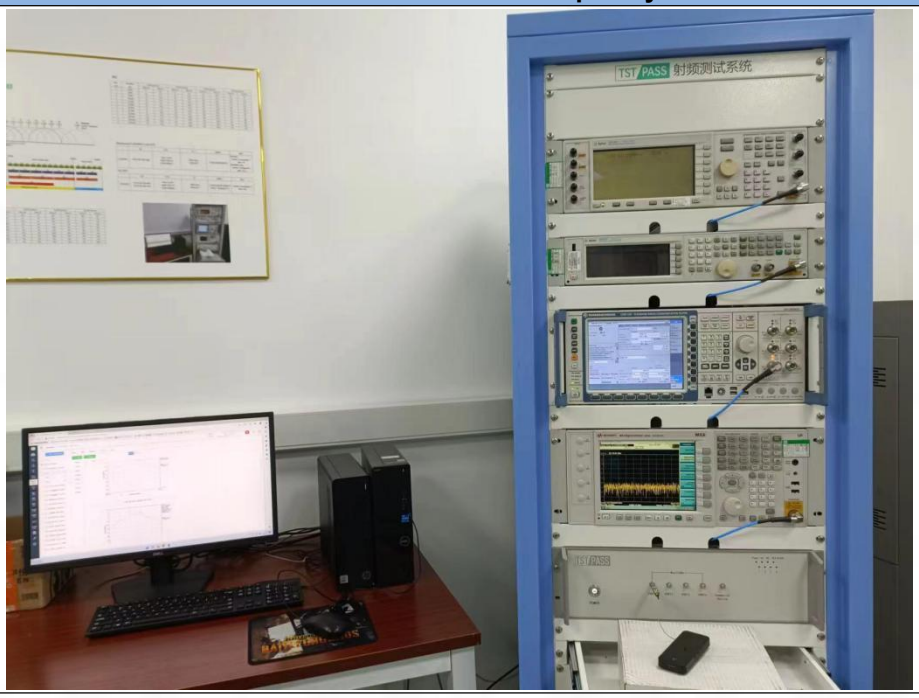
7 Test Setup Photos

Conducted Emission at AC power line

Occupied Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in non-restricted frequency bands


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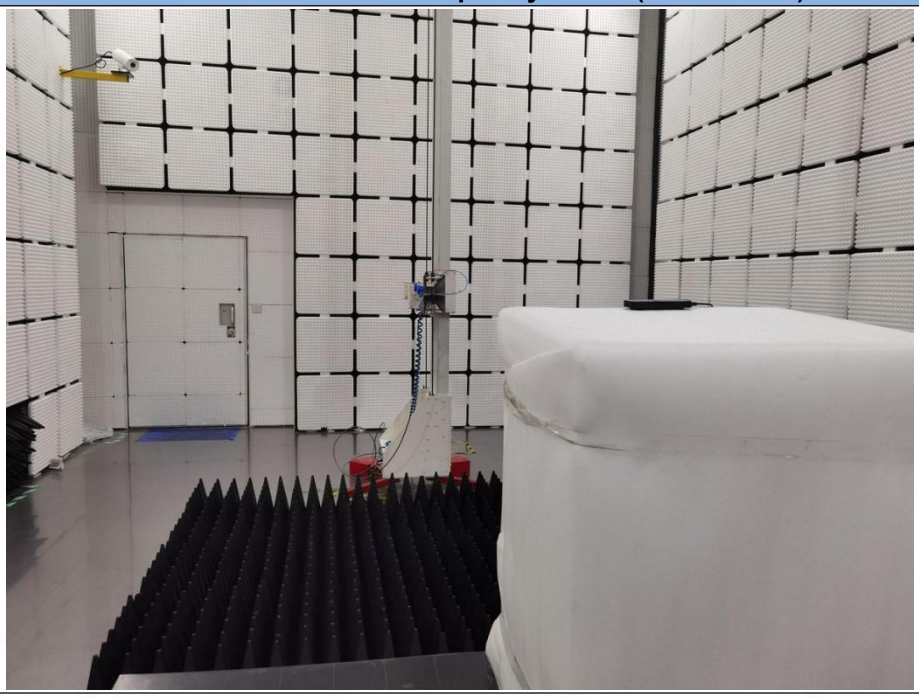
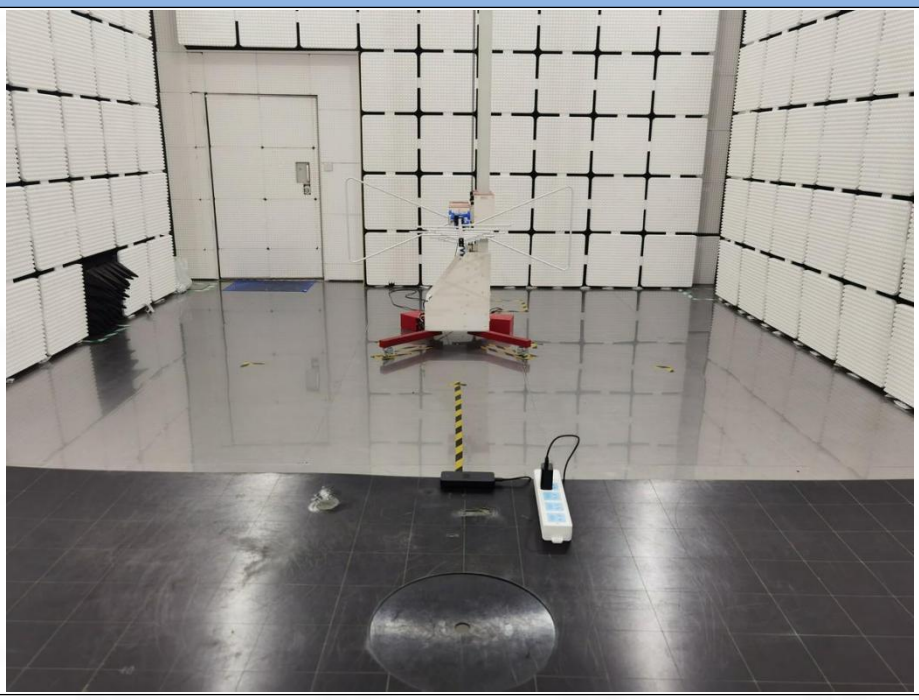
Band edge emissions (Radiated)
Emissions in restricted frequency bands (above 1GHz)



Emissions in restricted frequency bands (below 1GHz)



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8 EUT Constructional Details (EUT Photos)

Please refer to Report BTF230626R00401

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Appendix

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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 (%)
802.11b	SISO	2412	8.383	8.413	99.64	0.02	0.04
		2437	8.383	8.413	99.64	0.02	0.04
		2462	8.384	8.414	99.64	0.02	0.04
802.11g	SISO	2412	1.392	1.428	97.48	0.11	0.03
		2437	1.394	1.428	97.62	0.10	0.03
		2462	1.395	1.428	97.69	0.10	0.03
802.11n (HT20)	SISO	2412	1.302	1.336	97.46	0.11	0.03
		2437	1.302	1.336	97.46	0.11	0.03
		2462	1.302	1.336	97.46	0.11	0.03
802.11n (HT40)	SISO	2422	0.650	0.684	95.03	0.22	0.07
		2437	0.649	0.682	95.16	0.22	0.03
		2452	0.649	0.683	95.02	0.22	0.04

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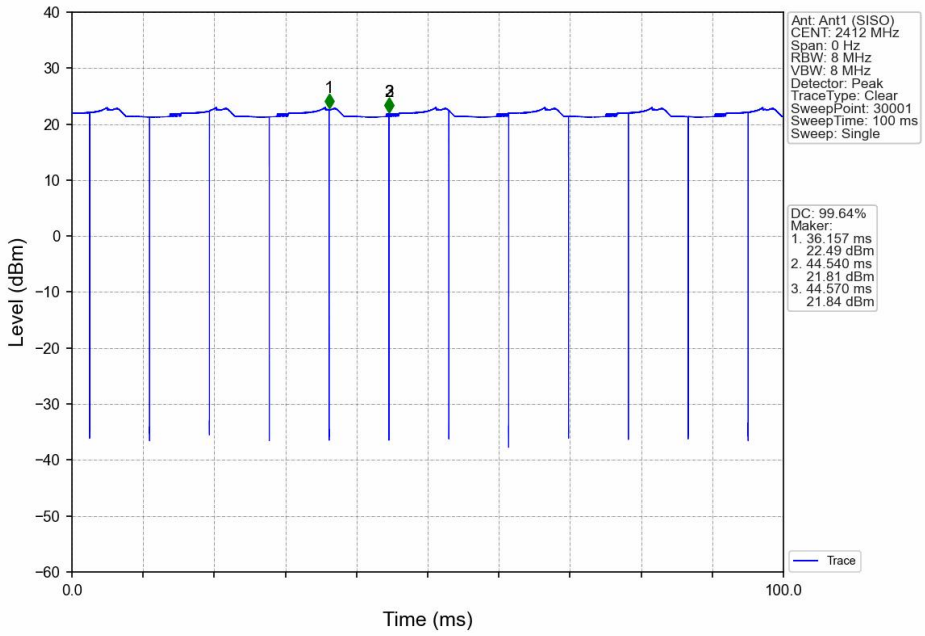
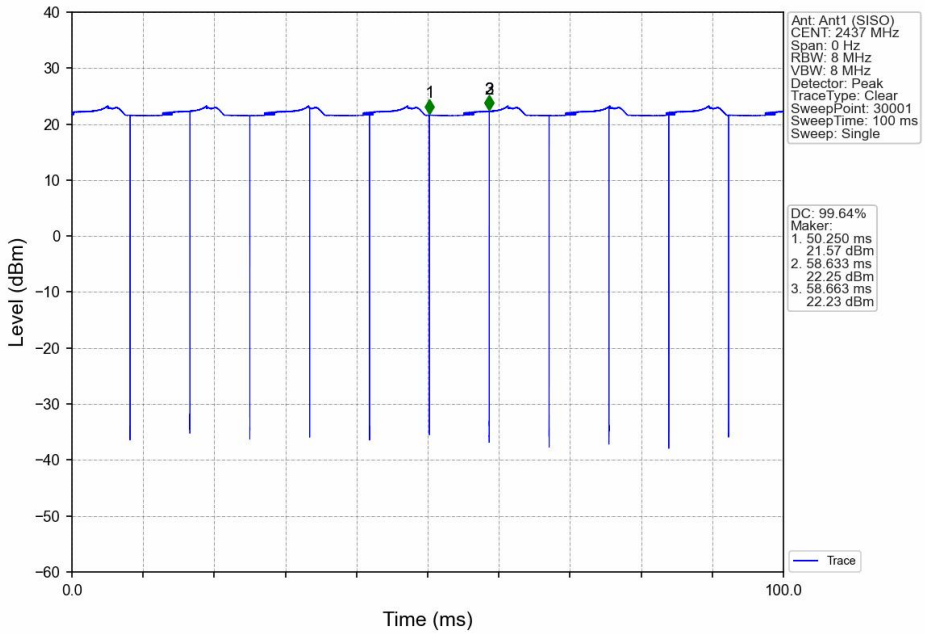
1.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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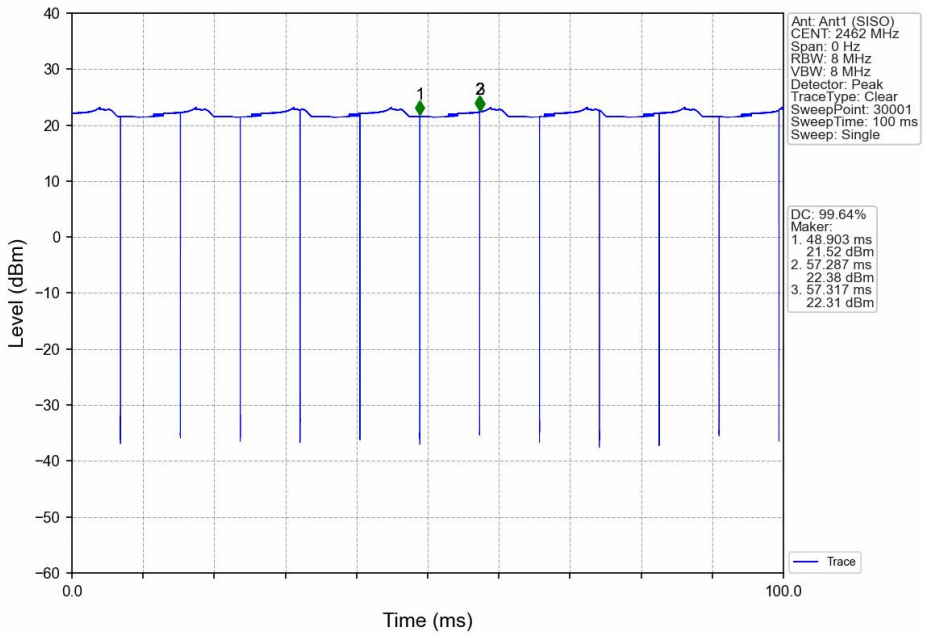
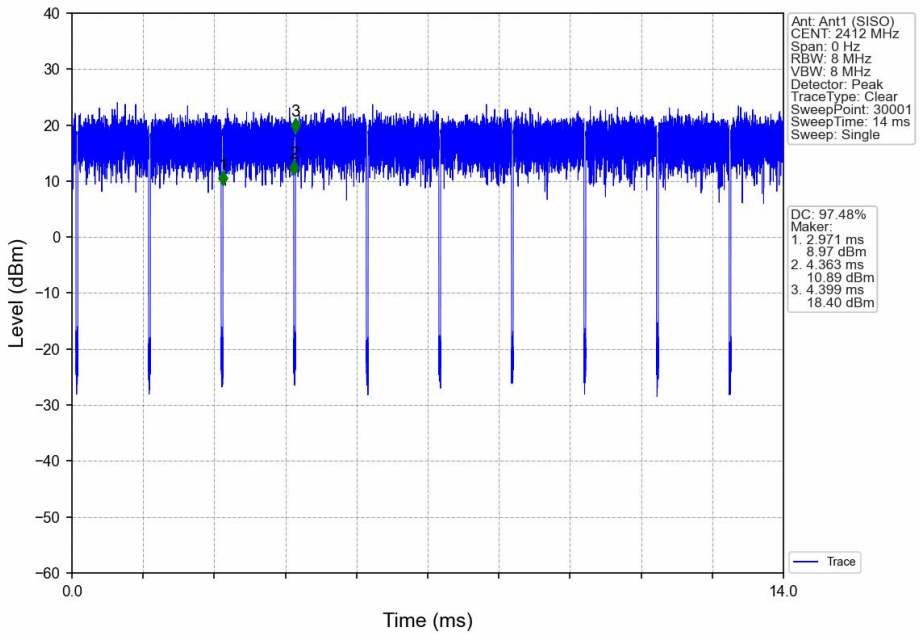
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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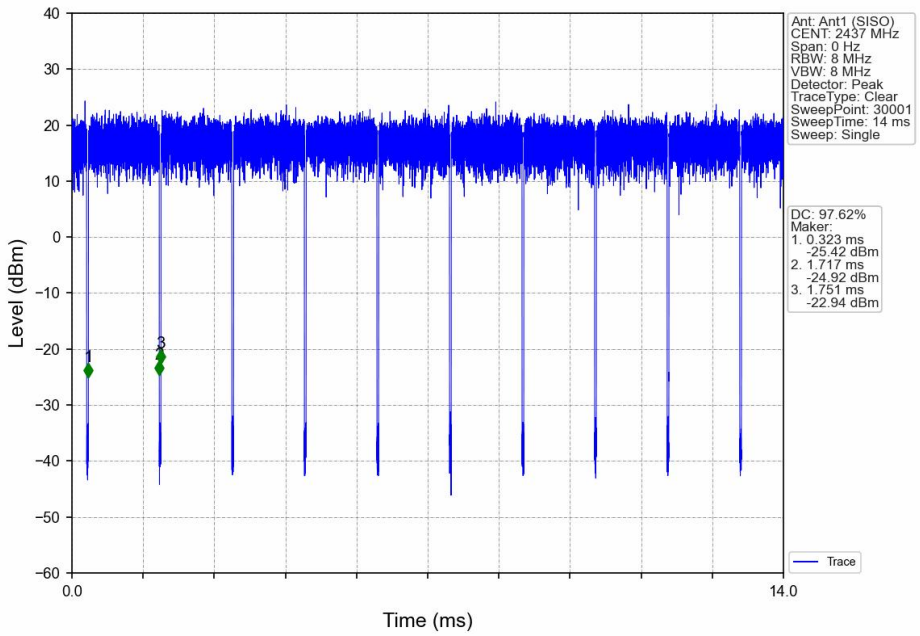
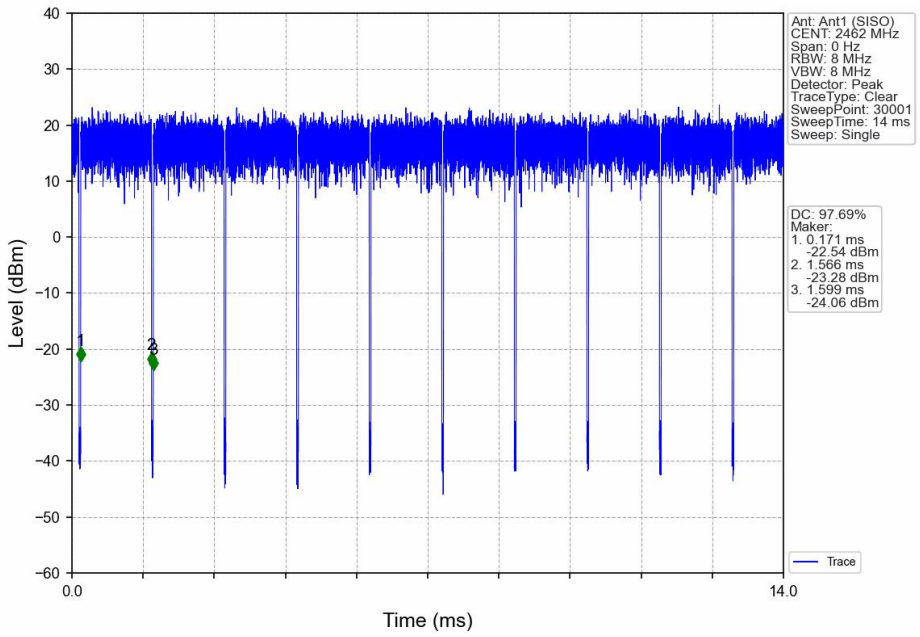
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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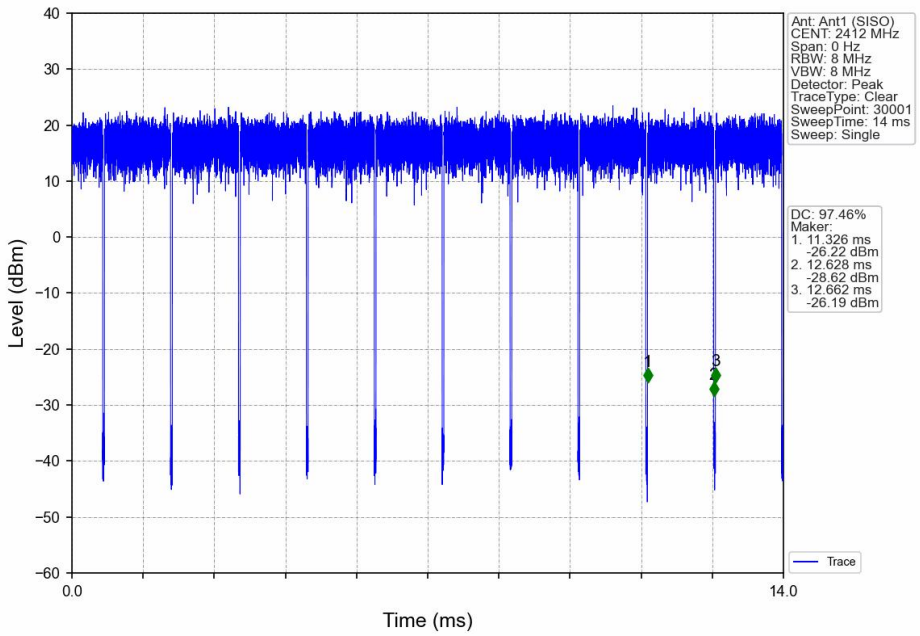
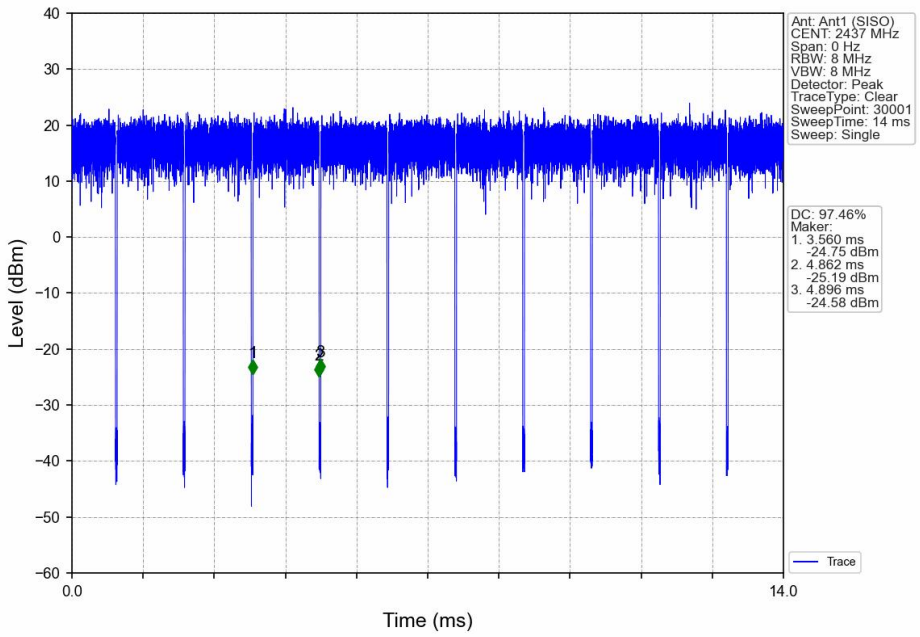
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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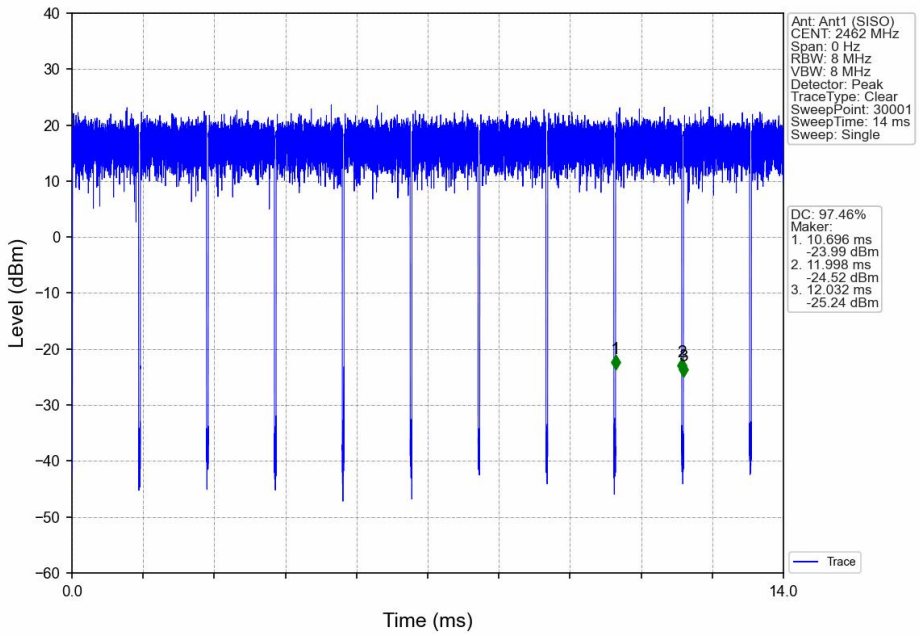
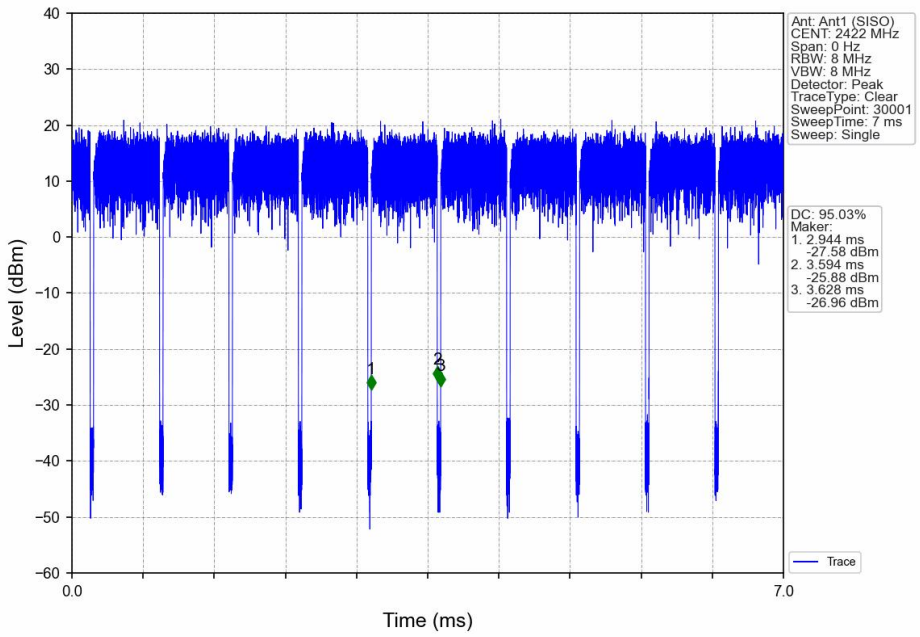
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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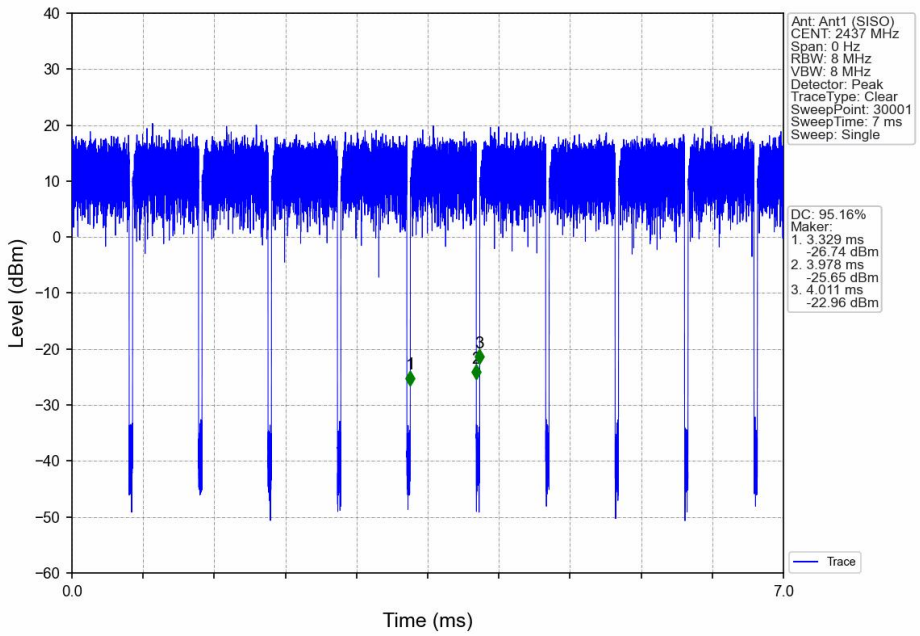
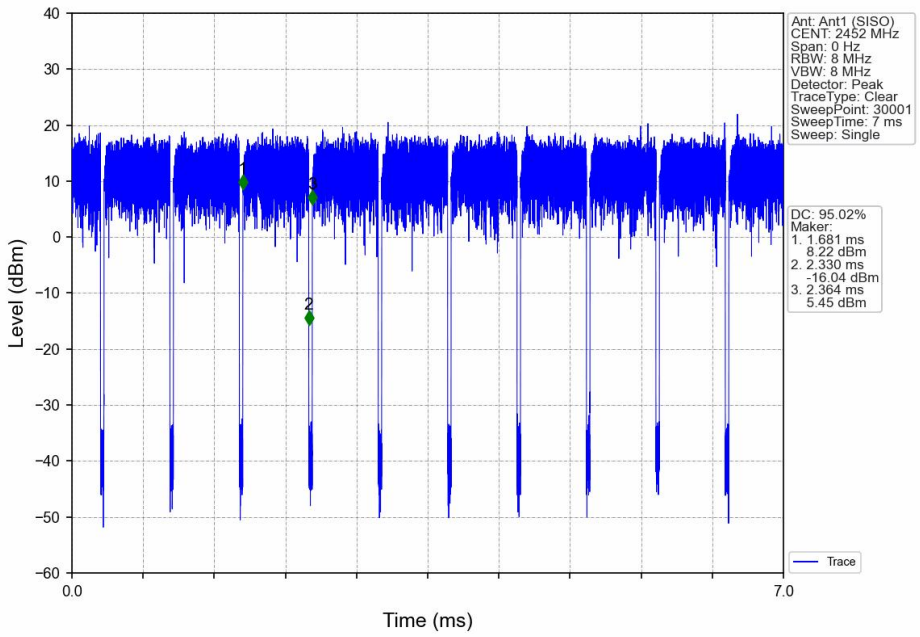
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz) Result	Verdict
802.11b	SISO	2412	1	12.970	Pass
		2437	1	12.955	Pass
		2462	1	12.919	Pass
802.11g	SISO	2412	1	17.553	Pass
		2437	1	17.573	Pass
		2462	1	17.597	Pass
802.11n (HT20)	SISO	2412	1	18.403	Pass
		2437	1	18.396	Pass
		2462	1	18.405	Pass
802.11n (HT40)	SISO	2422	1	36.881	Pass
		2437	1	36.743	Pass
		2452	1	36.730	Pass

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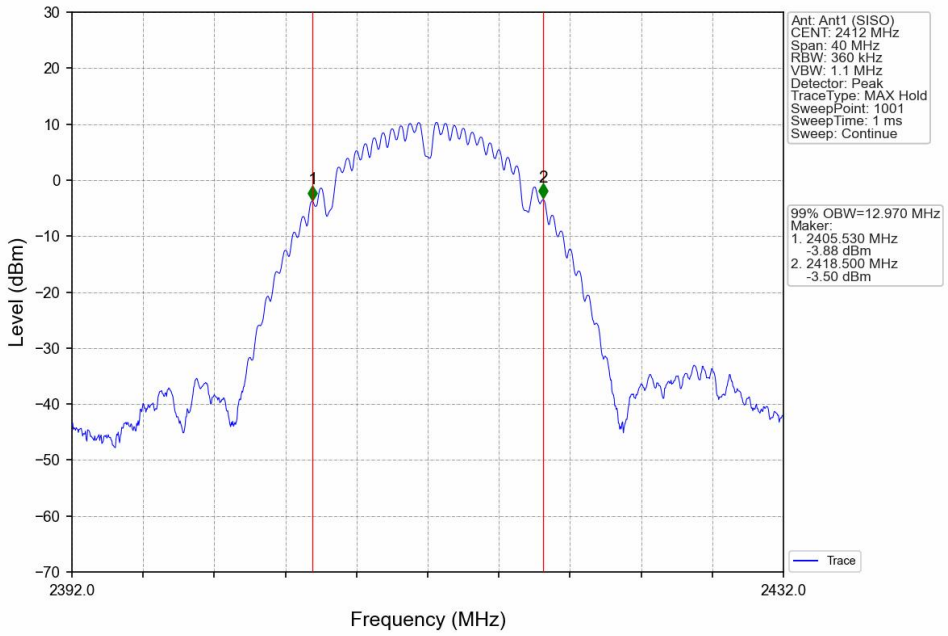
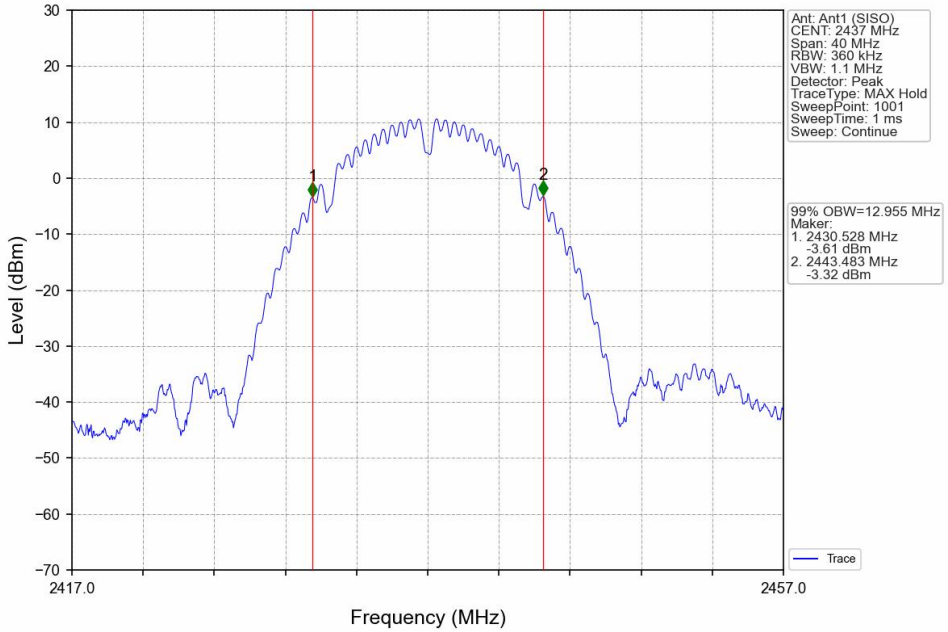
2.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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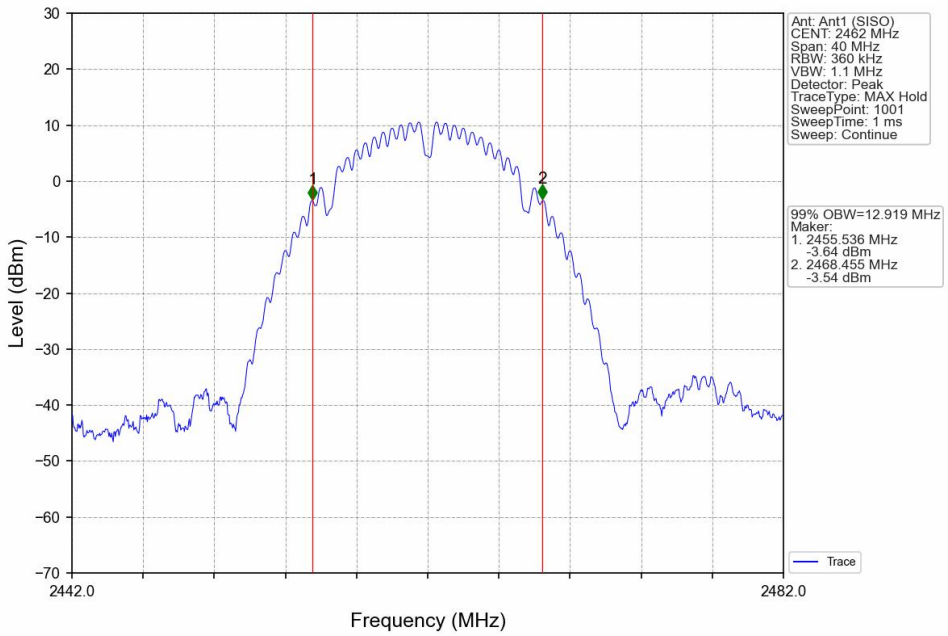
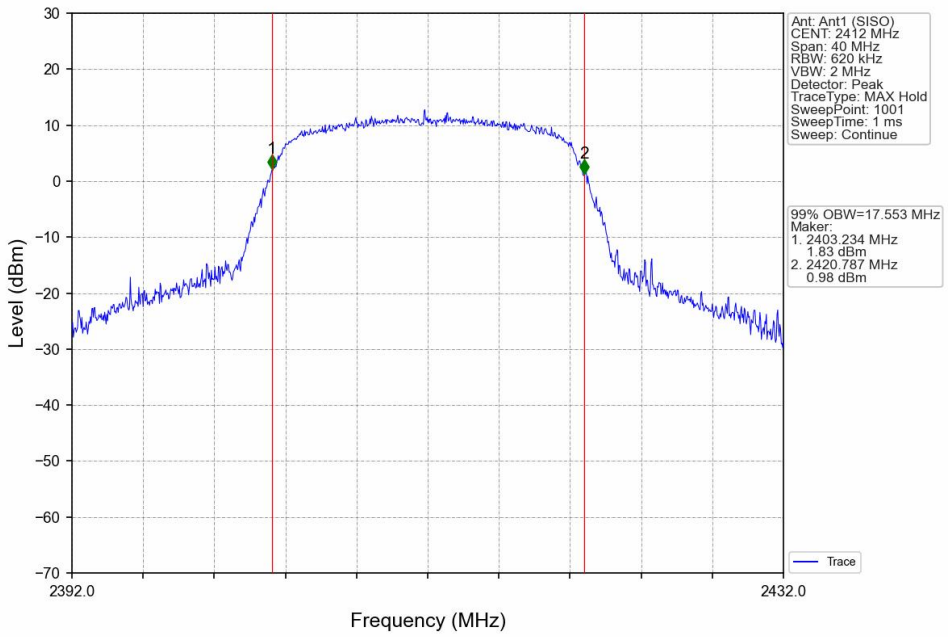
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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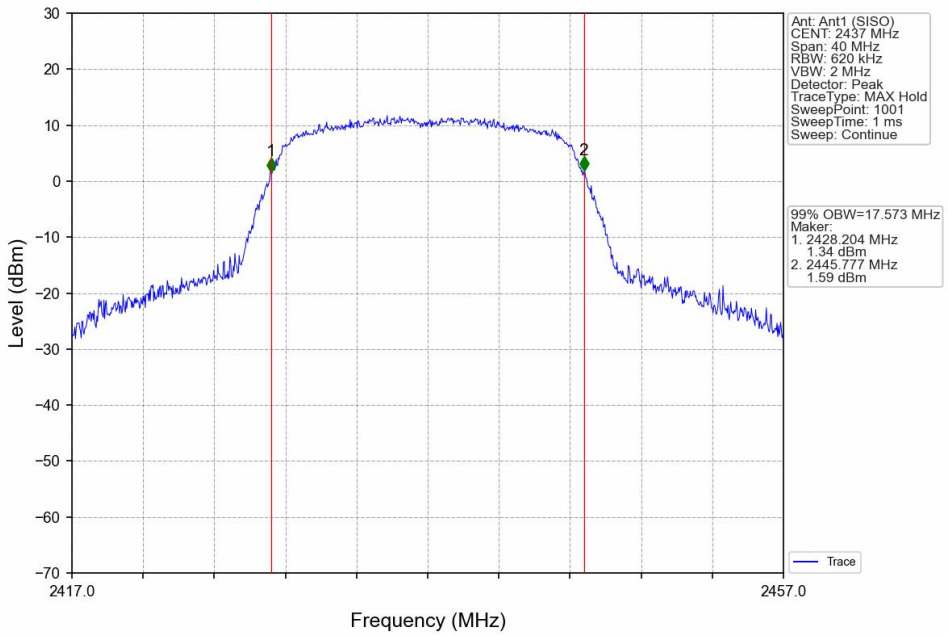
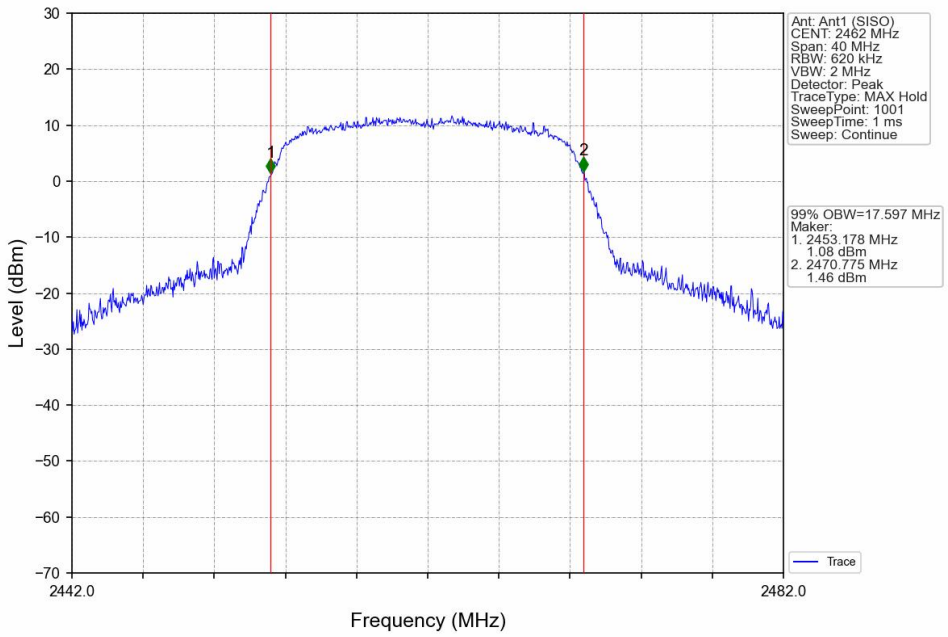
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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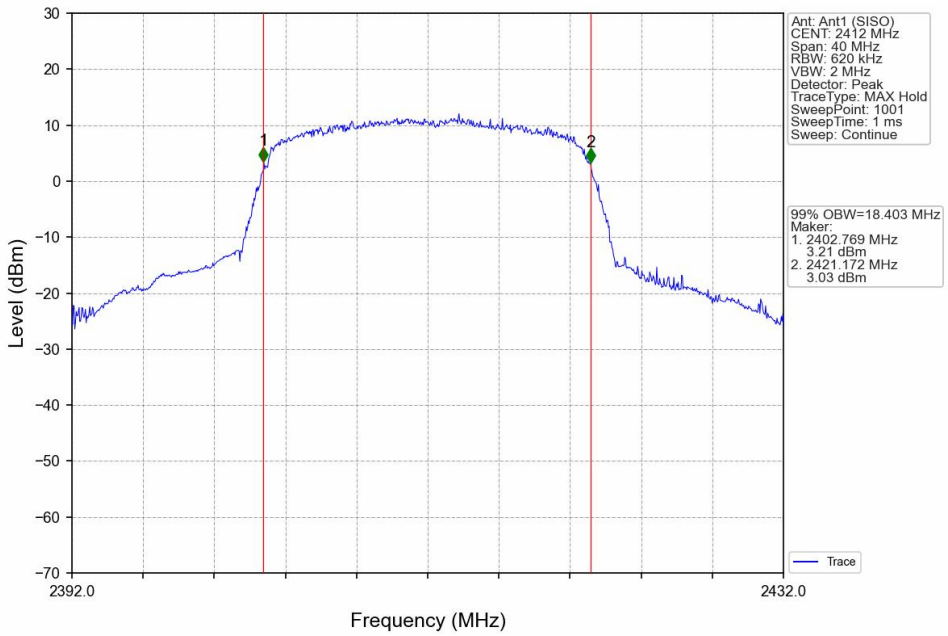
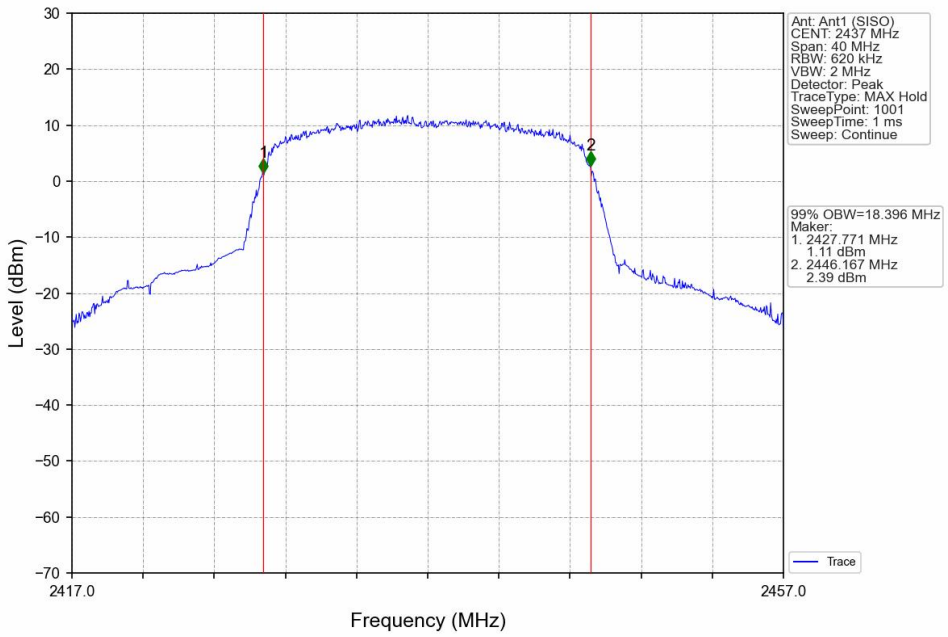
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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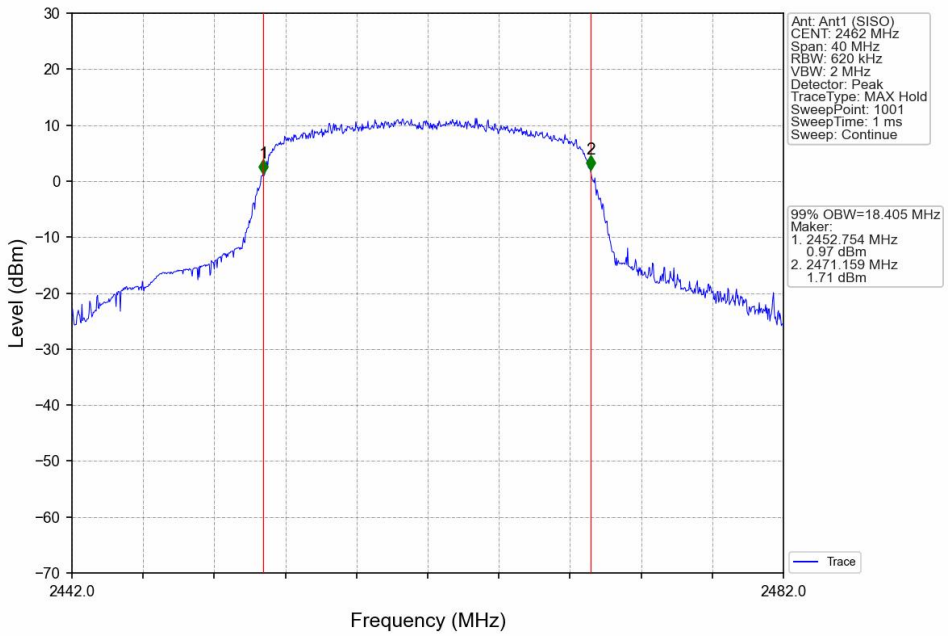
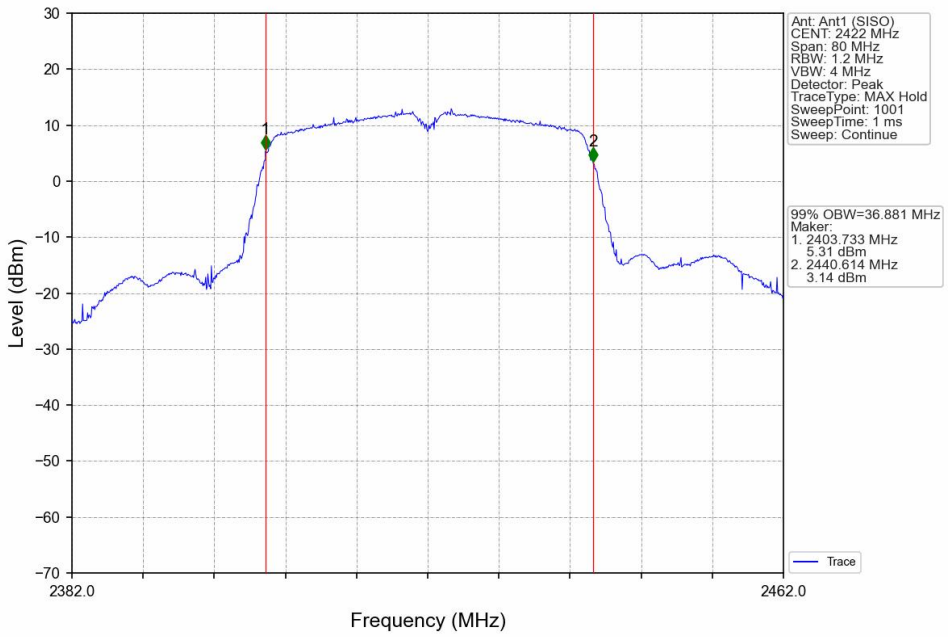
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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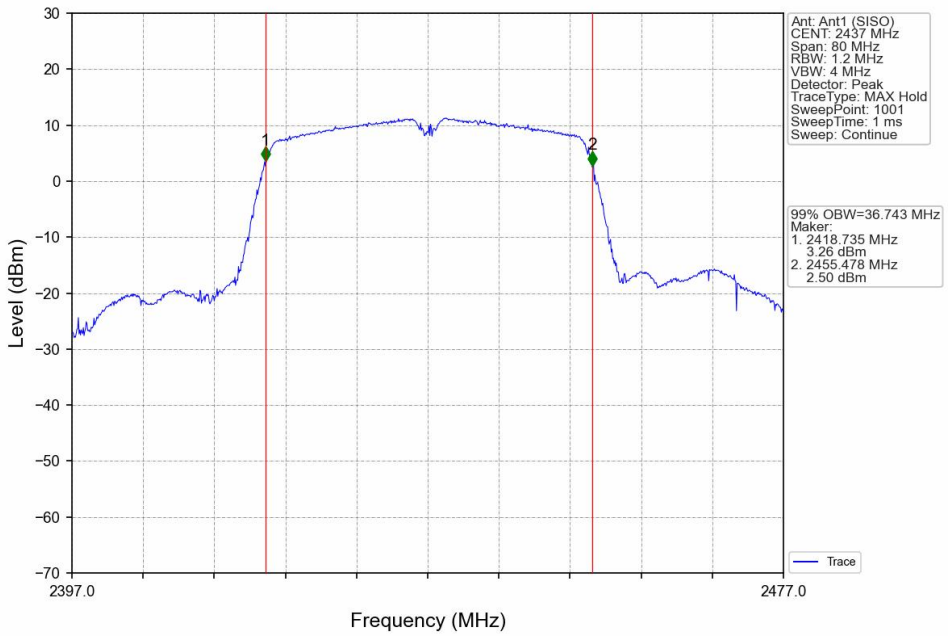
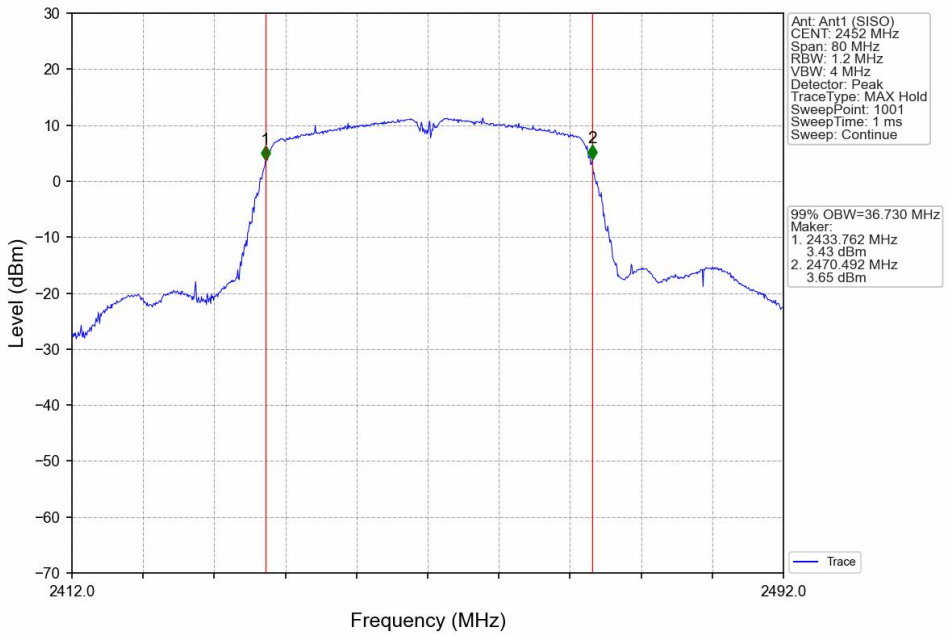
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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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	
802.11b	SISO	2412	1	8.103	>=0.5	Pass
		2437	1	8.587	>=0.5	Pass
		2462	1	8.093	>=0.5	Pass
802.11g	SISO	2412	1	15.555	>=0.5	Pass
		2437	1	15.164	>=0.5	Pass
		2462	1	15.170	>=0.5	Pass
802.11n (HT20)	SISO	2412	1	15.173	>=0.5	Pass
		2437	1	15.174	>=0.5	Pass
		2462	1	15.175	>=0.5	Pass
802.11n (HT40)	SISO	2422	1	35.160	>=0.5	Pass
		2437	1	35.163	>=0.5	Pass
		2452	1	35.158	>=0.5	Pass

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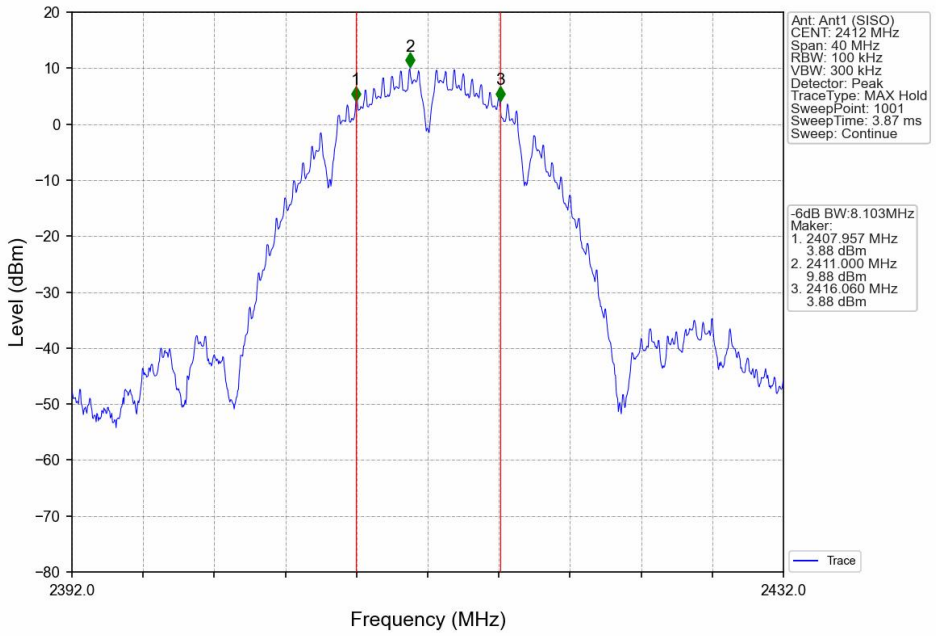
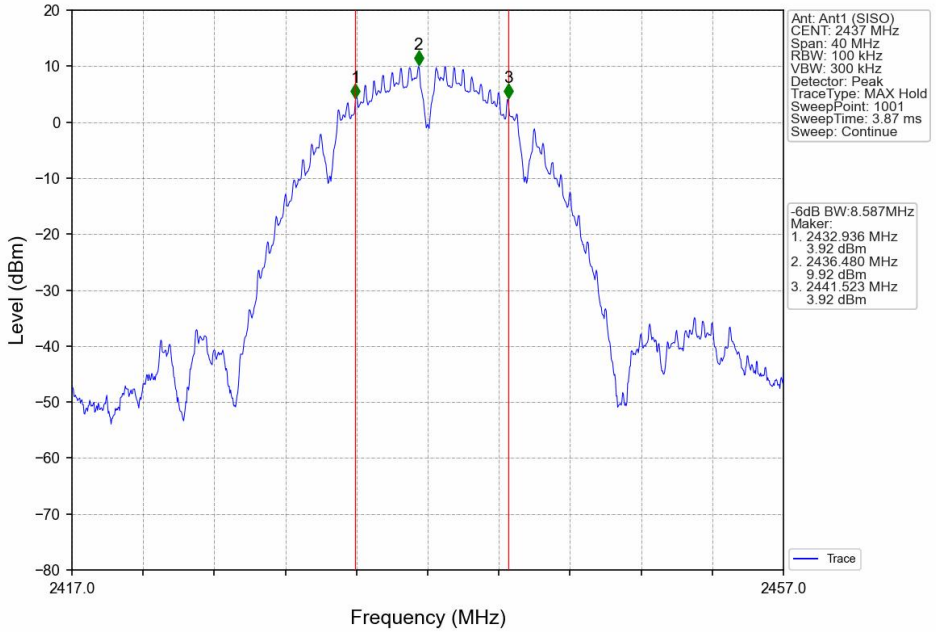
2.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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