

TEST REPORT

Applicant: Braeburn Systems LLC

Address of Applicant: 2215 CORNELL AVENUE MONTGOMERY, ILLINOIS 60538,
United States

Manufacturer: Computime Limited

Address of Manufacturer: 17/F, Great Eagle Centre, 23 Harbour Road, Wanchai Hong
Kong

Factory: Computime Electronics (Shenzhen) Company Limited

Address of Factory: Yuekenguangyu Industrial Park, Kangqiao Road 88#,
Danzhutou Community, Nanwan Street Office
Longgang District, Shenzhen, China

Equipment Under Test (EUT)

Product Name: thermostat

Model No.: 8501

Trade Mark: BRAEBURN

FCC ID: 2ADX6-8501

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249

Date of sample receipt: April 12, 2024

Date of Test: April 12-30, 2024

Date of report issued: April 30, 2024

Test Result : PASS *

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

Authorized Signature:



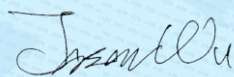
Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	April 30, 2024	Original

Prepared By:

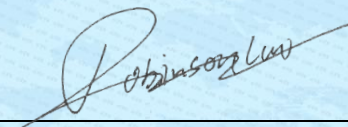


Date:

April 30, 2024

Project Engineer

Check By:



Date:

April 30, 2024

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remarks:

1. Test according to ANSI C63.10: 2013.
2. Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	thermostat
Model No.:	8501
S/N:	BRA8501
Test sample(s) ID:	GTS2024040200-1
Sample(s) Status	Engineered sample
Operation Frequency:	915MHz
Channel numbers:	1
Modulation type:	FSK
Antenna Type:	Monopole Antenna
Antenna gain:	0.52dBi
Power supply:	AC 24V Or DC 3V(2*1.5V Size“AA” Battery)

Note:

1. Antenna gain information provided by the customer.
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
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Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	89.59	92.12	90.20

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
EVER BRIGHT(ZHUHAI)ELECTRONIC CO., LTD	CLASS 2 TRANSFORMER	EB-UI10008D3	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: ● FCC—Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. ● ISED—Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
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5.7 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.8 Additional Instructions

Test Software	Continuously transmitter provided by manufacturer
Power level setup	Default

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 13, 2024	April 12, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 13, 2024	April 12, 2025
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 13, 2024	April 12, 2025
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 12, 2024	March 11, 2025
14	Amplifier	/	LNA-1000-30S	GTS650	April 13, 2024	April 12, 2025
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov.07, 2024
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	April 13, 2024	April 12, 2025
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 18, 2024	April 17, 2025
18	RE cable 1	GTS	N/A	GTS675	July 31. 2023	July 30. 2024
19	RE cable 2	GTS	N/A	GTS676	July 31. 2023	July 30. 2024
20	RE cable 3	GTS	N/A	GTS677	July 31. 2023	July 30. 2024
21	RE cable 4	GTS	N/A	GTS678	July 31. 2023	July 30. 2024
22	RE cable 5	GTS	N/A	GTS679	July 31. 2023	July 30. 2024
23	RE cable 6	GTS	N/A	GTS680	July 31. 2023	July 30. 2024
24	RE cable 7	GTS	N/A	GTS681	July 31. 2023	July 30. 2024
25	RE cable 8	GTS	N/A	GTS682	July 31. 2023	July 30. 2024

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 13, 2024	April 12, 2025
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	April 13, 2024	April 12, 2025
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 18, 2024	April 17, 2025
7	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 13, 2024	April 12, 2025
8	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 13, 2024	April 12, 2025
9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 13, 2024	April 12, 2025
10	Antenna end assembly	Weinschel	1870A	GTS560	April 13, 2024	April 12, 2025

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 13, 2024	April 12, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 13, 2024	April 12, 2025
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 13, 2024	April 12, 2025
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 13, 2024	April 12, 2025
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 13, 2024	April 12, 2025
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 13, 2024	April 12, 2025
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 13, 2024	April 12, 2025
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 13, 2024	April 12, 2025
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 18, 2024	April 17, 2025

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	April 18, 2024	April 17, 2025

7 Test results and Measurement Data

7.1 Antenna requirement

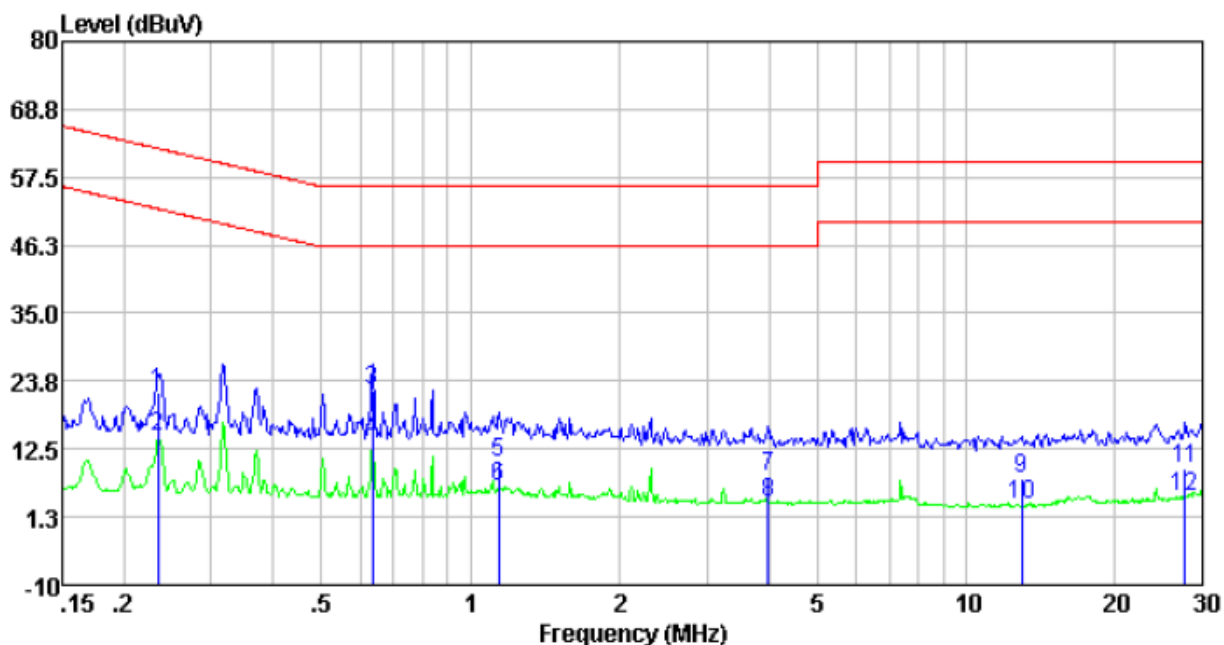
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling 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.	
EUT Antenna:	
The antenna is Monopole Antenna, reference to the appendix II for details	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		Limit (dBuV)				
			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.						
Test setup:	Reference Plane <i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
Test Instruments:	Refer to section 6.0 for details						
Test mode:	Refer to section 5.2 for details						
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar	
Test voltage:	AC 120V, 60Hz						
Test results:	Pass						

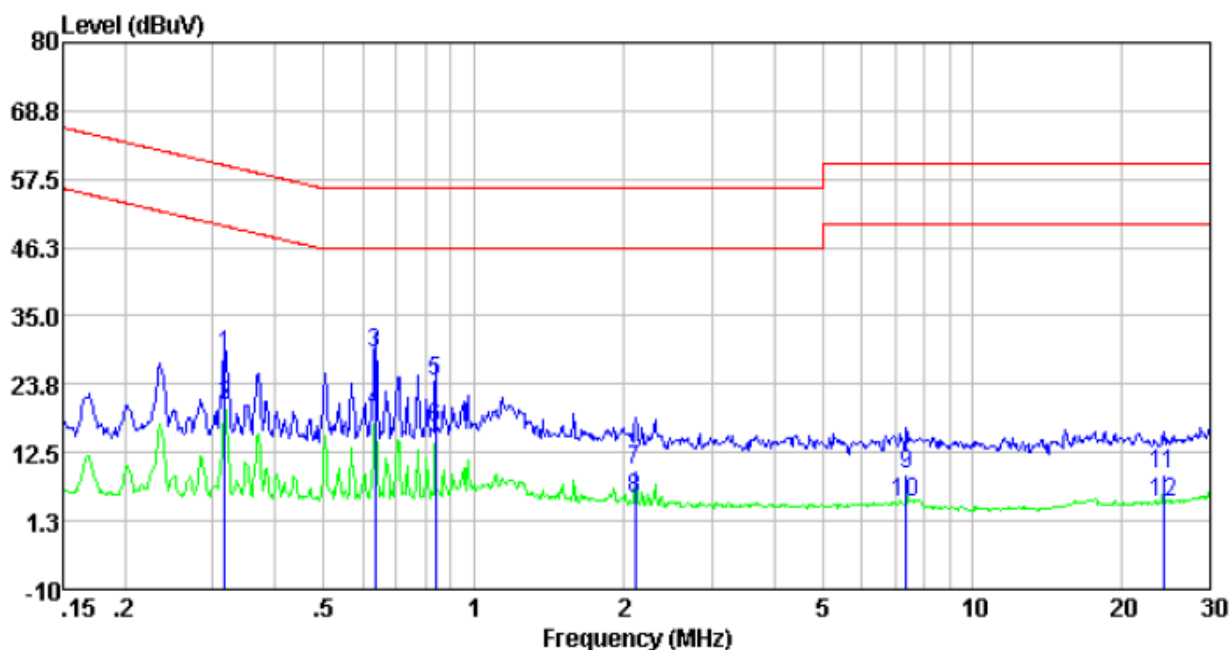
Measurement data:

Line:



Freq	Reading	LISN/ISN	Cable	Level	Limit	Over	Remark
MHz	dBuV	factor	loss	dBuV	dBuV	limit	
		dB	dB			dB	
0.23	12.20	9.51	0.01	21.72	62.30	-40.58	QP
0.23	5.03	9.51	0.01	14.55	52.30	-37.75	Average
0.63	12.60	9.50	0.02	22.12	56.00	-33.88	QP
0.63	4.26	9.50	0.02	13.78	46.00	-32.22	Average
1.14	0.65	9.51	0.03	10.19	56.00	-45.81	QP
1.14	-3.35	9.51	0.03	6.19	46.00	-39.81	Average
3.99	-1.48	9.51	0.06	8.09	56.00	-47.91	QP
3.99	-5.97	9.51	0.06	3.60	46.00	-42.40	Average
12.92	-1.86	9.47	0.14	7.75	60.00	-52.25	QP
12.92	-6.40	9.47	0.14	3.21	50.00	-46.79	Average
27.71	-1.07	10.05	0.20	9.18	60.00	-50.82	QP
27.71	-5.71	10.05	0.20	4.54	50.00	-45.46	Average

Neutral:

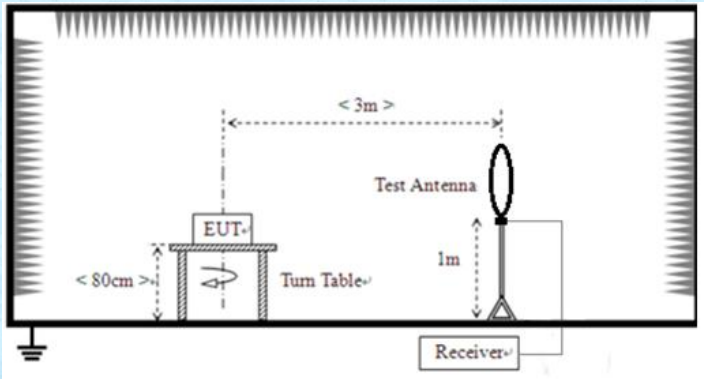


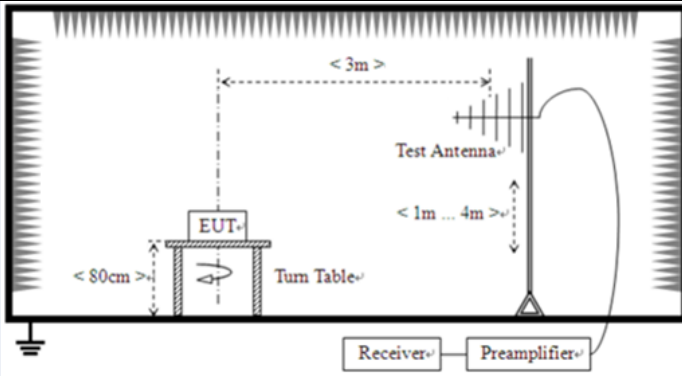
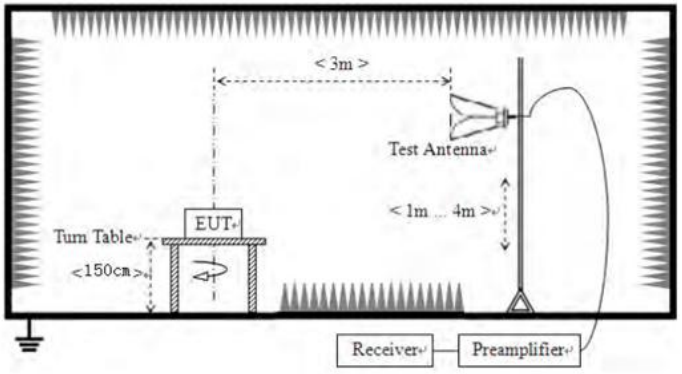
Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.32	18.79	9.56	0.01	28.36	59.80	-31.44	QP
0.32	10.76	9.56	0.01	20.33	49.80	-29.47	Average
0.63	19.12	9.56	0.02	28.70	56.00	-27.30	QP
0.63	9.69	9.56	0.02	19.27	46.00	-26.73	Average
0.84	14.74	9.55	0.03	24.32	56.00	-31.68	QP
0.84	7.00	9.55	0.03	16.58	46.00	-29.42	Average
2.11	0.00	9.55	0.05	9.60	56.00	-46.40	QP
2.11	-4.50	9.55	0.05	5.10	46.00	-40.90	Average
7.37	-0.66	9.53	0.09	8.96	60.00	-51.04	QP
7.37	-5.37	9.53	0.09	4.25	50.00	-45.75	Average
24.14	-1.47	10.25	0.19	8.97	60.00	-51.03	QP
24.14	-6.07	10.25	0.19	4.37	50.00	-45.63	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 10GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	902-928MHz		94.00		QP Value
Limit: (Spurious Emissions)	Frequency		Limit (uV/m)		Remark
	0.009MHz-0.490MHz		2400/F(kHz) @300m		Quasi-peak Value
	0.490MHz-1.705MHz		24000/F(kHz) @30m		Quasi-peak Value
	1.705MHz-30.0MHz		30 @30m		Quasi-peak Value
	30MHz-88MHz		100 @3m		Quasi-peak Value
	88MHz-216MHz		150 @3m		Quasi-peak Value
	216MHz-960MHz		200 @3m		Quasi-peak Value
	960MHz-1GHz		500 @3m		Quasi-peak Value
	Above 1GHz		500 @3m		Average Value
		5000 @3m		Peak Value	
Limit: (band edge)	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
	For radiated emissions from 30MHz to1GHz				

	 For radiated emissions above 1GHz 
Test Procedure:	

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
915.00	85.20	24.03	4.91	30.92	83.22	94.00	-10.78	Vertical
915.00	94.10	24.03	4.91	30.92	92.12	94.00	-1.88	Horizontal

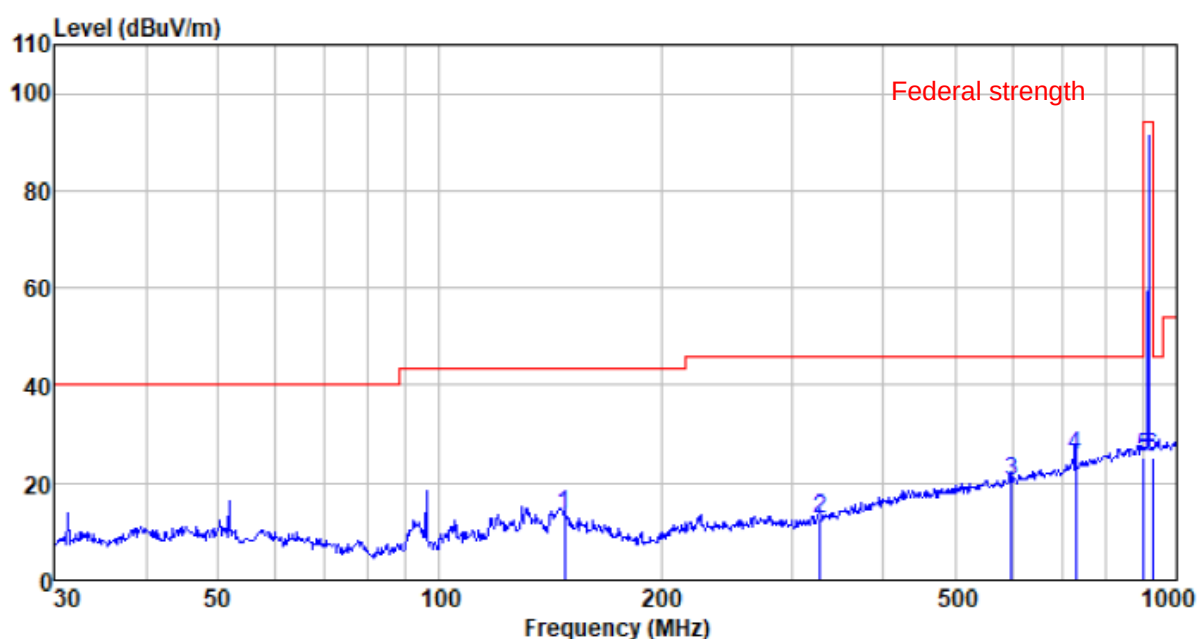
7.3.2 Spurious emissions and Band Edge

■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

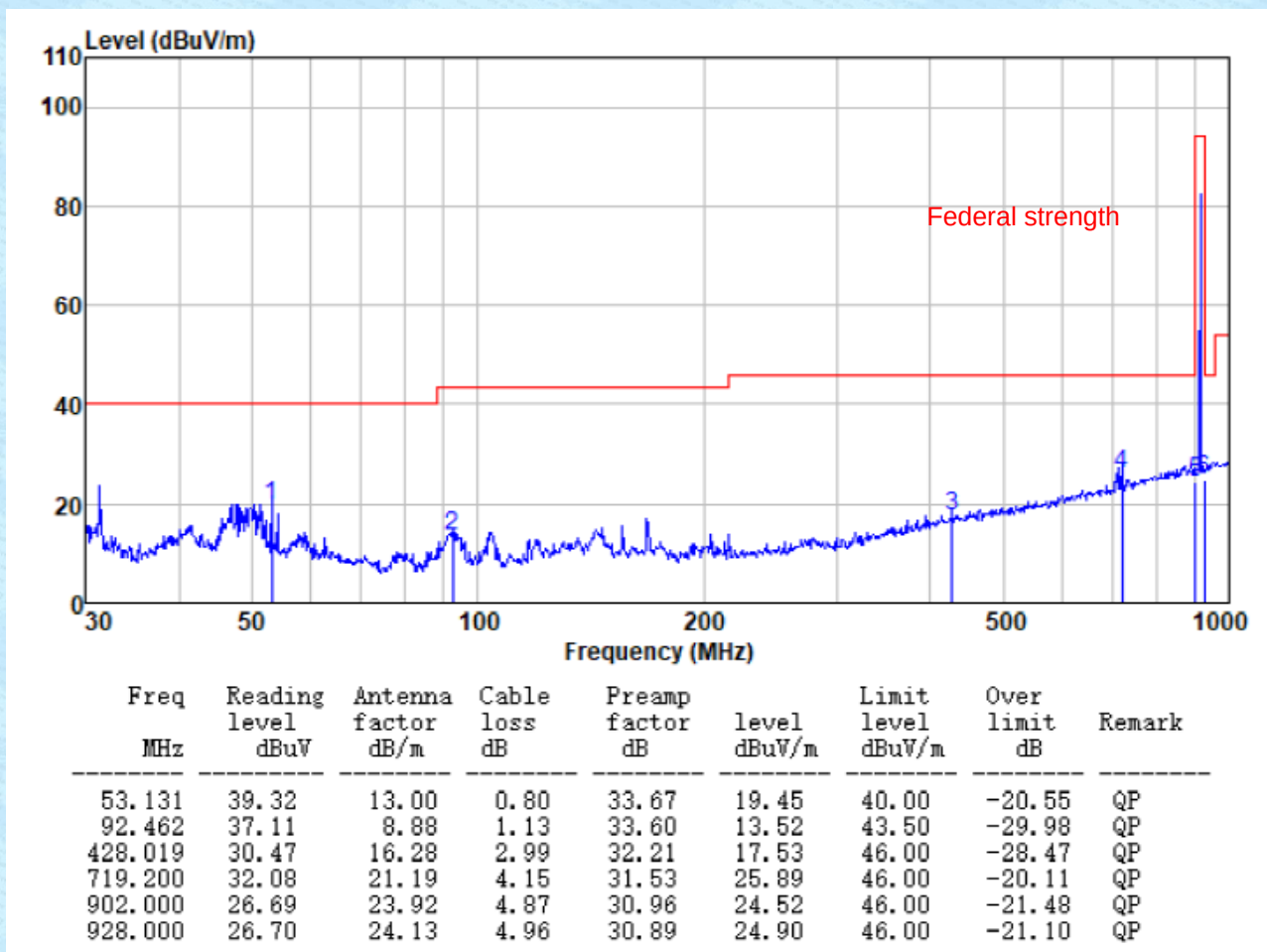
■ Below 1GHz

Test Frequency:	915MHz	Polarization:	Horizontal
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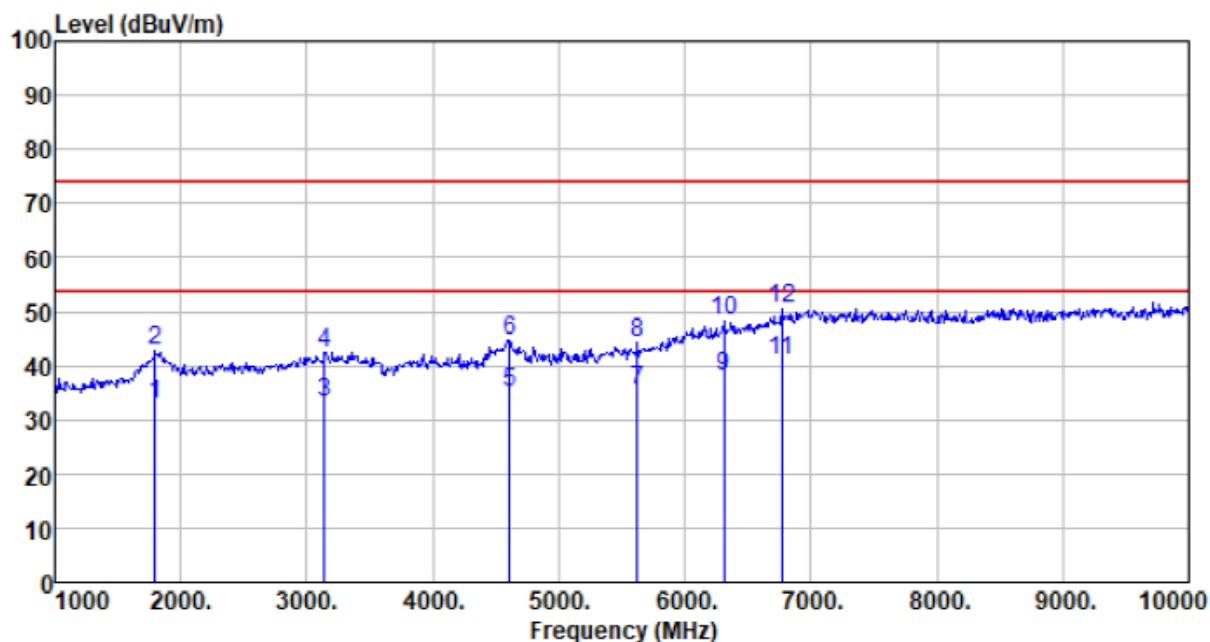
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
147.921	32.31	12.48	1.56	33.15	13.20	43.50	-30.30	QP
327.887	29.23	13.42	2.51	32.58	12.58	46.00	-33.42	QP
597.223	28.95	19.26	3.71	31.79	20.13	46.00	-25.87	QP
729.358	31.48	21.38	4.19	31.50	25.55	46.00	-20.45	QP
902.000	27.23	23.92	4.87	30.96	25.06	46.00	-20.94	QP
928.000	26.95	24.13	4.96	30.89	25.15	46.00	-20.85	QP

Test Frequency:	915MHz	Polarization:	Vertical
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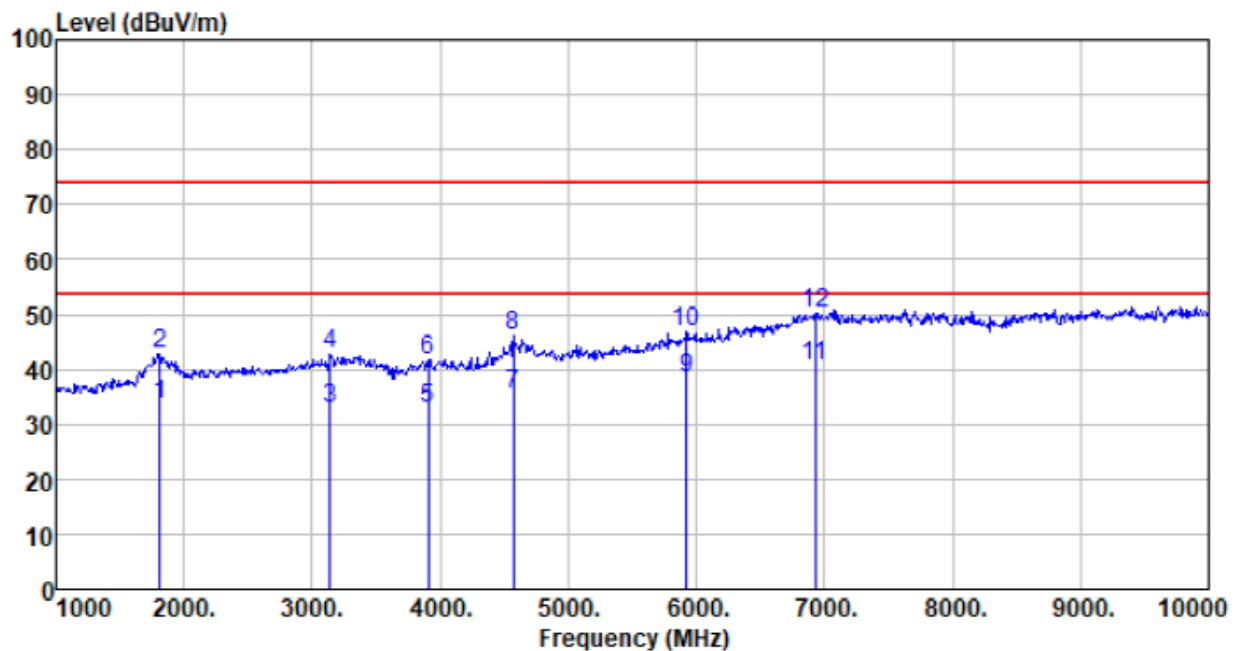
■ Above 1GHz

Test Frequency:	915MHz	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1792.000	37.46	25.78	8.04	38.57	32.71	54.00	-21.29	Average
1792.000	47.66	25.78	8.04	38.57	42.91	74.00	-31.09	Peak
3142.000	37.96	28.60	5.35	38.57	33.34	54.00	-20.66	Average
3142.000	47.09	28.60	5.35	38.57	42.47	74.00	-31.53	Peak
4609.000	34.36	30.51	8.69	38.32	35.24	54.00	-18.76	Average
4609.000	43.84	30.51	8.69	38.32	44.72	74.00	-29.28	Peak
5626.000	34.73	32.35	6.99	38.63	35.44	54.00	-18.56	Average
5626.000	43.57	32.35	6.99	38.63	44.28	74.00	-29.72	Peak
6310.000	33.92	33.62	9.35	38.76	38.13	54.00	-15.87	Average
6310.000	44.19	33.62	9.35	38.76	48.40	74.00	-25.60	Peak
6769.000	34.75	34.95	9.96	38.85	40.81	54.00	-13.19	Average
6769.000	44.39	34.95	9.96	38.85	50.45	74.00	-23.55	Peak

Test Frequency:	915MHz	Polarization:	Vertical
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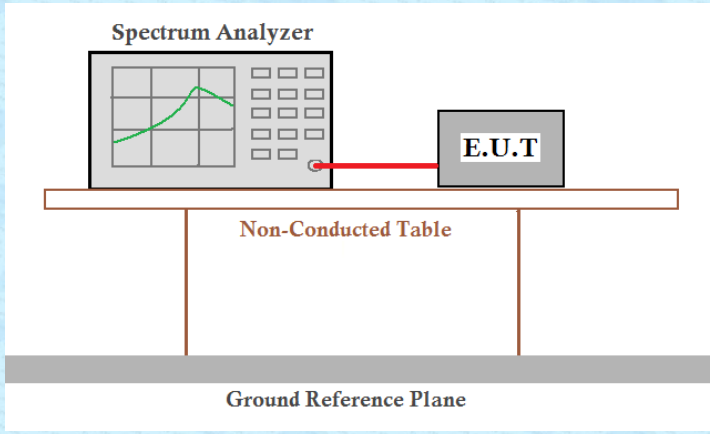


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1810.000	38.38	25.85	8.01	38.55	33.69	54.00	-20.31	Average
1810.000	47.50	25.85	8.01	38.55	42.81	74.00	-31.19	Peak
3142.000	37.37	28.60	5.35	38.57	32.75	54.00	-21.25	Average
3142.000	47.53	28.60	5.35	38.57	42.91	74.00	-31.09	Peak
3907.000	35.72	29.17	6.17	38.26	32.80	54.00	-21.20	Average
3907.000	44.66	29.17	6.17	38.26	41.74	74.00	-32.26	Peak
4573.000	34.95	30.40	8.41	38.31	35.45	54.00	-18.55	Average
4573.000	45.59	30.40	8.41	38.31	46.09	74.00	-27.91	Peak
5923.000	35.89	32.47	8.86	38.68	38.54	54.00	-15.46	Average
5923.000	44.15	32.47	8.86	38.68	46.80	74.00	-27.20	Peak
6931.000	33.95	35.33	10.35	38.89	40.74	54.00	-13.26	Average
6931.000	43.31	35.33	10.35	38.89	50.10	74.00	-23.90	Peak

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

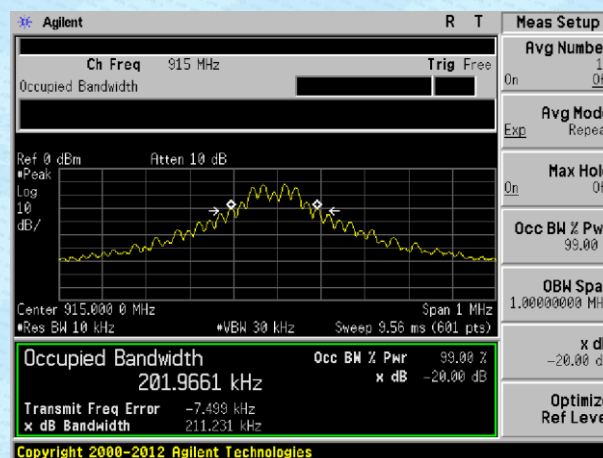
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 902MHz~928MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Test Frequency	20dB bandwidth(kHz)	Result
915MHz	211.231	Pass

Test plot as follows:



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----