



TEST REPORT

Applicant: Waterworks Inc DBA SoilDrops
Address of Applicant: 411 E. Huntington Drive # 107 Arcadia, CA 91006 United States
Manufacturer: Waterworks Inc DBA SoilDrops
Address of Manufacturer: 411 E. Huntington Drive # 107 Arcadia, CA 91006 United States
Product Name: Soildrops Smart Irrigation Controller
Model No.: CTL-801
Trade Mark: Soildrops
FCC ID: 2BSSN-CTL801
Applicable standards: CFR 47 Part 15.249
Date of Test: Aug.05, 2025-Sep.29, 2025
Date of report issued: Dec.09, 2025

Remark:

The 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

Prepared By

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Report Revision History		
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1 Test Summary

Test Item	Section in CFR 47	Result	Test by
Antenna requirement	15.203	Pass	/
AC Power Line Conducted Emission	15.207	PASS	Jason Huang
Field strength of the fundamental signal	15.249 (a)	Pass	Jason Huang
Spurious emissions	15.249 (a) (d)/15.209	Pass	Jason Huang
20dB Occupied Bandwidth 99% Occupied Bandwidth	15.215 (c)	Pass	Kara Wu

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10-2020
3. Note: Compliance determination rules
 - 1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacture. If measurement uncertainty is taken into account, the applicant/manufacture will bear all possible risks of non-compliance.
 - 2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"

Measurement Uncertainty

Test Item	Uncertainty Criterion	Measurement Uncertainty	Notes
Duty cycle	±5%	±0.05%	(1)
Occupied Channel Bandwidth	±5%	0.55%	(1)
RF output power, conducted	±1.5dB	±0.57dB	(1)
Power Spectral Density, conducted	±3dB	±0.61dB	(1)
Unwanted Emissions, conducted	±3dB	±0.64dB	(1)
AC Power Line Conducted Emission	±6dB	± 2.55 dB	(1)
Radiated emissions Below 1GHz	±6dB	± 4.24 dB	(1)
Radiated emissions Above 1GHz	±6dB	± 4.26 dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

2 General Information

2.1 General Description of EUT

Product Name:	Soildrops Smart Irrigation Controller
Model No.:	CTL-801
Model of difference:	N/A
Test model:	CTL-801
Hardware Version:	1.5
Software Version:	2.8
Power supply:	AC 110-120V /60Hz
Battery:	N/A
Adapter:	N/A
Operation Frequency:	915MHz
Channel numbers:	1
Channel separation:	/
Modulation type:	GFSK
Antenna Type:	External Antenna
Antenna gain:	2.5dBi Max.
<i>Remark:</i> <i>1. For more details, refer to the user's manual of the EUT.</i> <i>2. Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.</i>	



Operation Frequency and channel

Channel	Frequency
1	915 MHz

Test Frequency and channel

Channel	Frequency
1	915 MHz

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
<i>Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

2.3 Description of Support Units

No.	Description	Manufacturer	Model	Serial Number
1	NOTEBOOK COMPUTER	DELL	VOSTRO 3520	/

2.4 Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	+86 755 85259392

2.5 Additional Instructions

Test Software	Setup_SmartRF_Studio_7-2.29.0
Power level setup	Default



3 Test Instruments list

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100605	2025.3.06	2026.3.05
2	EMI Test Receiver	Rohde&schwarz	ESCI3	102696	2025.3.06	2026.3.05
3	Loop Antenna	schwarabeck	FMZB 1519 B	FMZB 1519 B	2024.3.22	2026.3.21
4	Broadband antenna	schwarabeck	VULB9168	1064	2024.3.26	2026.3.25
5	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2024.3.22	2026.3.21
6	amplifier	EMtrace	RP01A	50117	2025.3.06	2026.3.05
7	AMN	schwarabeck	NSLK8127	8127483	2025.3.06	2026.3.05
8	AMN	ETS	3186/2NM	1132	2025.3.06	2026.3.05
9	10dB attenuator	HUBER+SUHN R	10dB	/	2025.3.06	2026.3.05
10	amplifier	Space-Dtronics	EWLAN0118G- P40	19113001	2025.3.06	2026.3.05
11	Filter	Xingbo	XBLBQ-GTA19	210410-3-1	2025.3.06	2026.3.05
12	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2025.3.06	2026.3.05
13	Power control box	MWRFtest	MW100-PSB	MW201020JYT	2025.3.06	2026.3.05
14	Temp. & Humidity Chamber	Jiecheng Instrument	QA-LP-80	20160705001	2025.3.07	2026.3.06

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4 Test results and Measurement Data

4.1 Antenna requirement

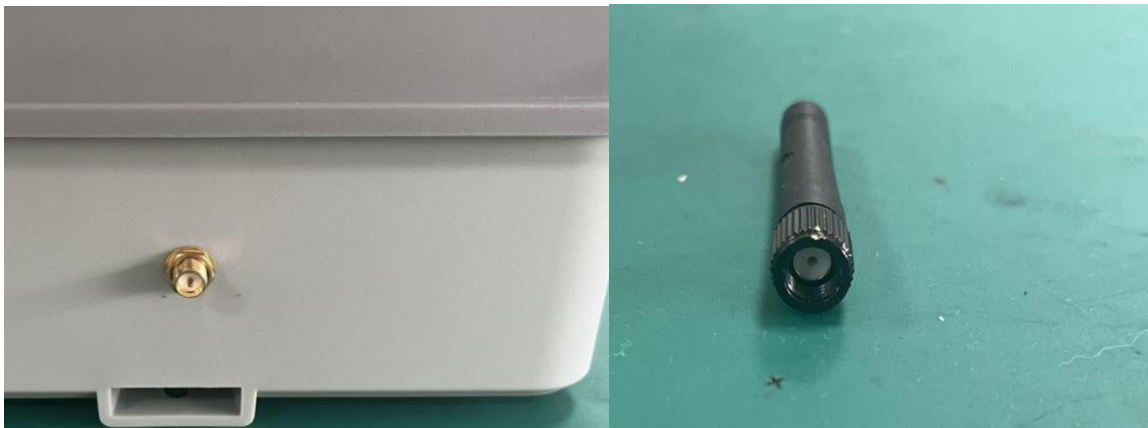
Standard requirement:

CFR47 part 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 External antenna, the best case gain of the antenna is 2.5dBi Max., reference to below for details.

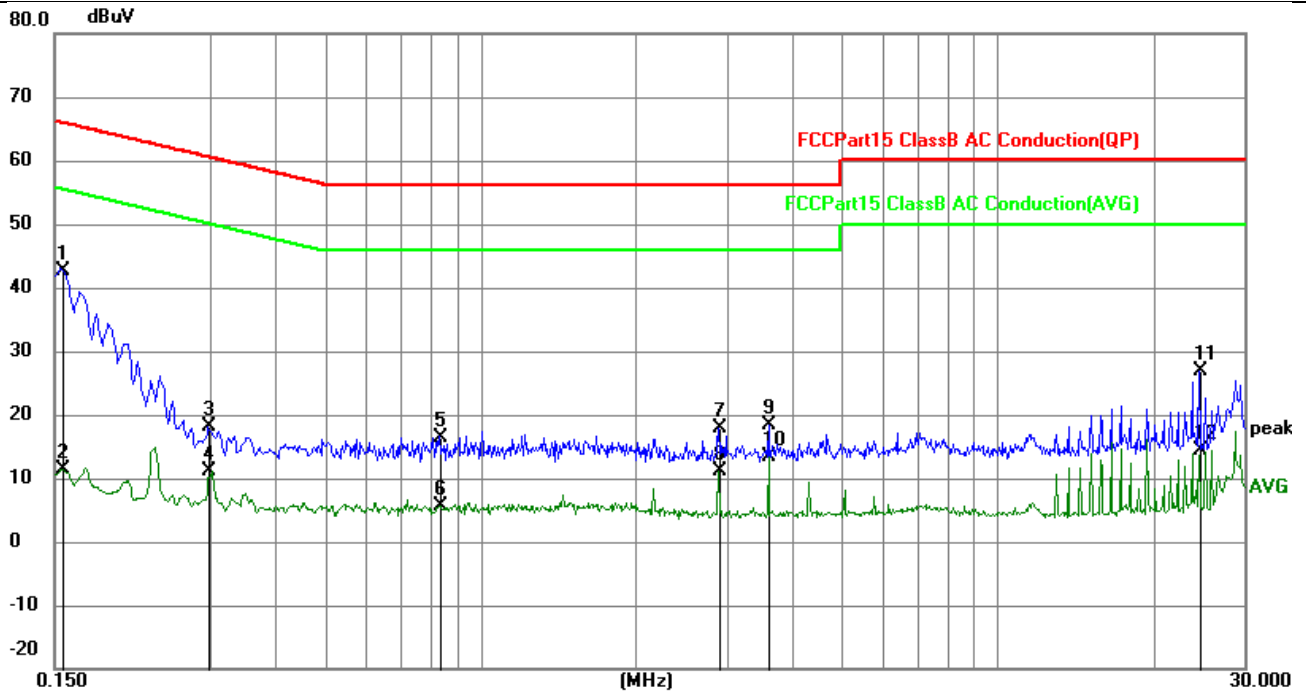


4.2 Conducted Emissions

Test Requirement:	CFR47 Part 15.207						
Test Method:	ANSI C63.10-2020 § 6.2						
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 40cm LISN AUX Equipment E.U.T 80cm LISN Filter AC power EMI Receiver Test table/Insulation plane Remark: 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 C63.10-2020 on conducted measurement.						
Test Instruments:	Refer to section 3.0 for details						
Test mode:	Refer to section 2.2 for details						
Test environment:	Temp.:	25.2°C	Humid.:	52%	Press.:	1012mbar	
Test voltage:	AC 120V/60Hz						
Test results:	PASS						

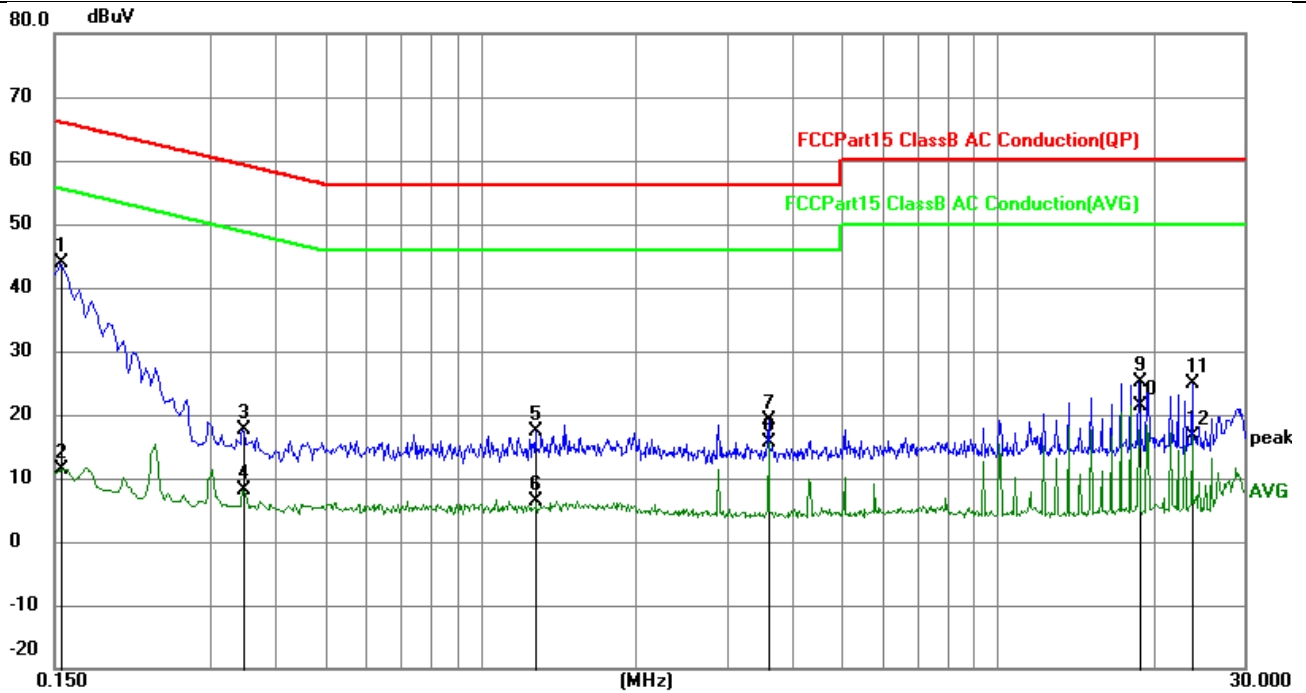
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1556	32.80	9.80	42.60	65.70	-23.10	QP
2	0.1556	1.59	9.80	11.39	55.70	-44.31	AVG
3	0.2985	8.22	9.84	18.06	60.28	-42.22	QP
4	0.2985	1.24	9.84	11.08	50.28	-39.20	AVG
5	0.8339	6.54	9.96	16.50	56.00	-39.50	QP
6	0.8339	-4.30	9.96	5.66	46.00	-40.34	AVG
7	2.8860	7.99	9.85	17.84	56.00	-38.16	QP
8	2.8860	1.34	9.85	11.19	46.00	-34.81	AVG
9	3.6150	8.50	9.84	18.34	56.00	-37.66	QP
10	3.6150	3.55	9.84	13.39	46.00	-32.61	AVG
11	24.5445	17.28	9.59	26.87	60.00	-33.13	QP
12	24.5445	4.67	9.59	14.26	50.00	-35.74	AVG

Neutral:

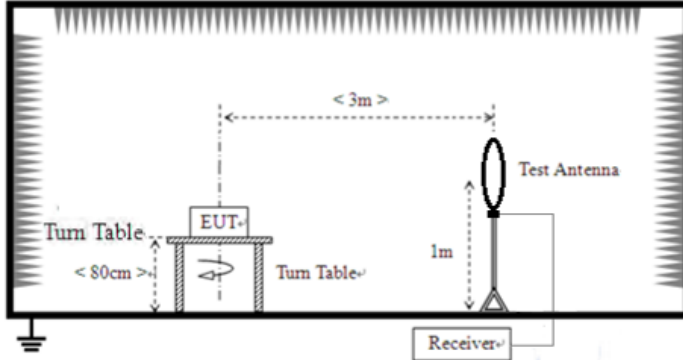


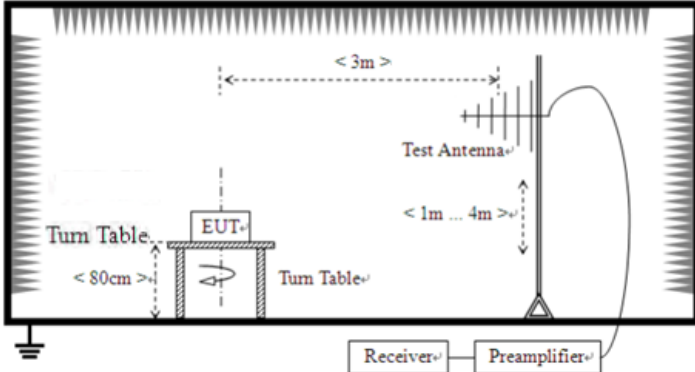
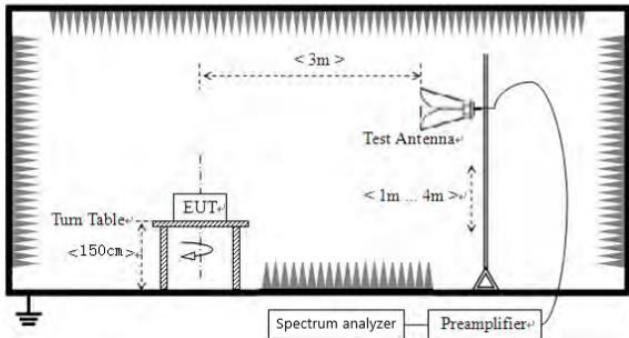
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1544	33.98	9.80	43.78	65.76	-21.98	QP
2	0.1544	1.57	9.80	11.37	55.76	-44.39	AVG
3	0.3480	7.74	9.88	17.62	59.01	-41.39	QP
4	0.3480	-1.84	9.88	8.04	49.01	-40.97	AVG
5	1.2794	7.49	9.92	17.41	56.00	-38.59	QP
6	1.2794	-3.43	9.92	6.49	46.00	-39.51	AVG
7	3.6150	9.32	9.84	19.16	56.00	-36.84	QP
8	3.6150	5.76	9.84	15.60	46.00	-30.40	AVG
9	18.8025	15.54	9.69	25.23	60.00	-34.77	QP
10	18.8025	11.64	9.69	21.33	50.00	-28.67	AVG
11	23.8650	15.28	9.60	24.88	60.00	-35.12	QP
12	23.8650	6.97	9.60	16.57	50.00	-33.43	AVG

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.
3. Level = Receiver Read level + Factor (Factor = LISN Factor + Cable Loss + Attenuator Factor)
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4.3 Radiated Emission measurement

Test Requirement:	CFR47 Part 15.209 & 15.249 (a) &(d).				
Test Method:	ANSI C63.10-2020 § 6.4&6.5&6.6				
Test Frequency Range:	9kHz to 25GHz				
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 and harmonics)	Frequency		Limit (dBuV/m @3m)		Remark
	902-928MHz		94.00		Fundamental
			54.00		Harmonics
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				
					
Test setup:	For radiated emissions from 30MHz to1GHz				

	 For radiated emissions above 1GHz 						
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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 Instruments:	Refer to section 3.0 for details						
Test mode:	Refer to section 2.2 for details						
Test environment:	<table><tr><td>Temp.:</td><td>22.3 °C</td><td>Humid.:</td><td>63%</td><td>Press.:</td><td>1012mbar</td></tr></table>	Temp.:	22.3 °C	Humid.:	63%	Press.:	1012mbar
Temp.:	22.3 °C	Humid.:	63%	Press.:	1012mbar		
Test voltage:	AC 120V/60Hz						
Test results:	Pass						



4.3.1 Field Strength of The Fundamental Signal

Frequency (MHz)	Read Level (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	polarization
915.00	87.99	-6.42	81.57	94.00	-12.43	QP	Vertical
915.00	91.81	-6.42	85.39	94.00	-8.61	QP	Horizontal

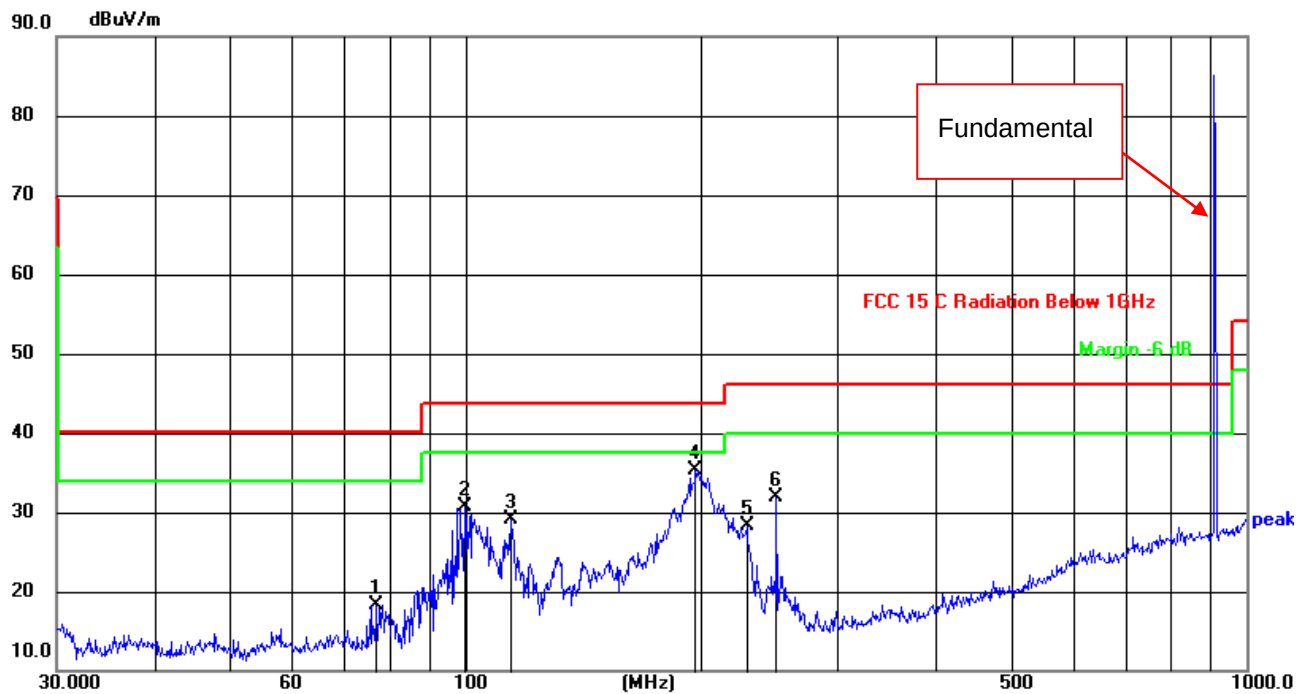
4.3.2 Spurious emissions

■ 9K- 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) & RSS-Gen 6.13, the test result no need to reported.

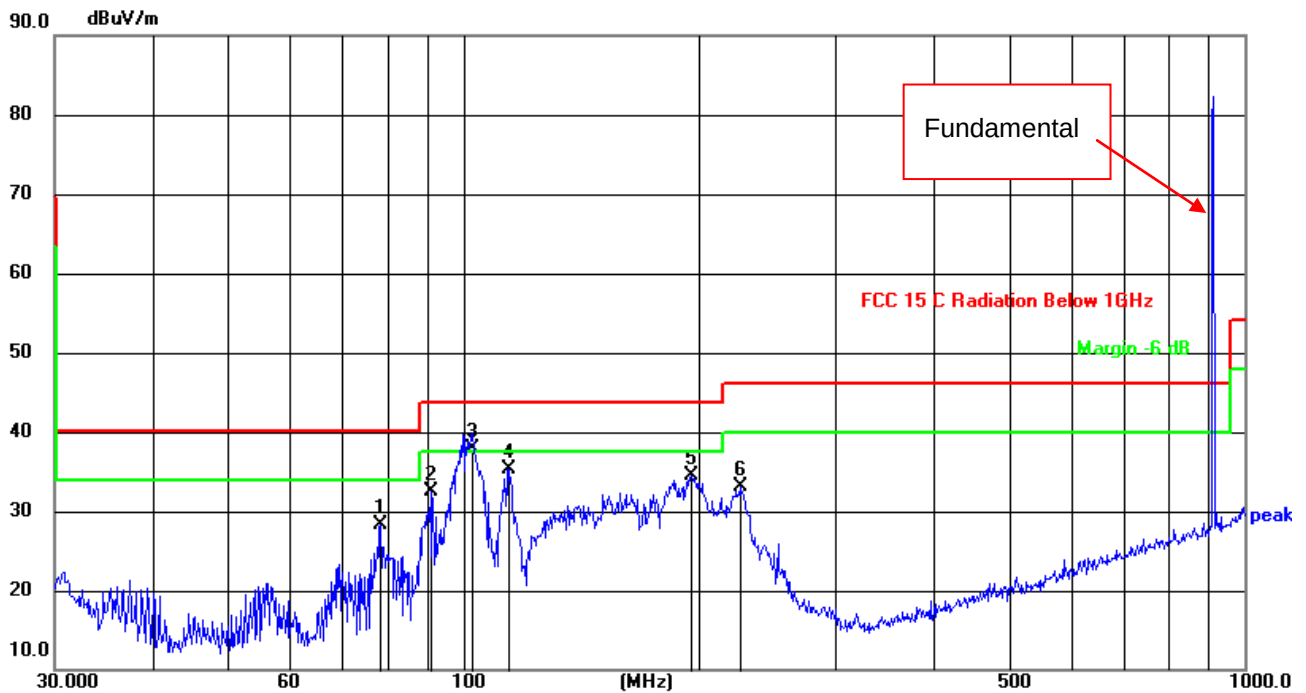
■ 30MHz-1GHz

Test polarization:	Horizontal	Test voltage:	AC 120V /60Hz
Temp.:	22.3°C	Humid.:	63%RH



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	77.0504	38.85	-20.53	18.32	40.00	-21.68	QP
2	99.8777	50.84	-20.10	30.74	43.50	-12.76	QP
3	114.5146	48.77	-19.64	29.13	43.50	-14.37	QP
4	197.2000	53.83	-18.45	35.38	43.50	-8.12	QP
5	229.2930	46.83	-18.47	28.36	46.00	-17.64	QP
6	250.3010	50.12	-18.25	31.87	46.00	-14.13	QP

Test polarization:	Vertical	Test voltage:	AC 120V /60Hz
Temp.:	22.3°C	Humid.:	63%RH



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	78.4133	48.62	-20.33	28.29	40.00	-11.71	QP
2	90.8554	52.48	-20.07	32.41	43.50	-11.09	QP
3	102.7192	57.81	-19.97	37.84	43.50	-5.66	QP
4	114.5146	54.87	-19.51	35.36	43.50	-8.14	QP
5	195.8218	53.27	-18.79	34.48	43.50	-9.02	QP
6	226.0994	51.45	-18.29	33.16	46.00	-12.84	QP

■ 1GHz-10GHz

Peak value:

Frequency (MHz)	Read Level (dBuV/m)	Correction Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.00	73.75	-15.40	58.35	74.00	-15.65	Horizontal
2745.00	66.87	-12.56	54.31	74.00	-19.69	Horizontal
3660.00	64.19	-10.32	53.87	74.00	-20.13	Horizontal
4757.00	62.42	-8.64	53.78	74.00	-20.22	Horizontal
5490.00	50.89	-6.70	44.19	74.00	-29.81	Horizontal
6405.00	---	---	---	---	---	Horizontal
1830.00	65.81	-15.40	50.41	74.00	-23.59	Vertical
2745.00	61.39	-12.56	48.83	74.00	-25.17	Vertical
3660.00	57.59	-10.32	47.27	74.00	-26.73	Vertical
4757.00	56.49	-8.64	47.85	74.00	-26.15	Vertical
5490.00	50.98	-6.70	44.28	74.00	-29.72	Vertical
6405.00	---	---	---	---	---	Vertical

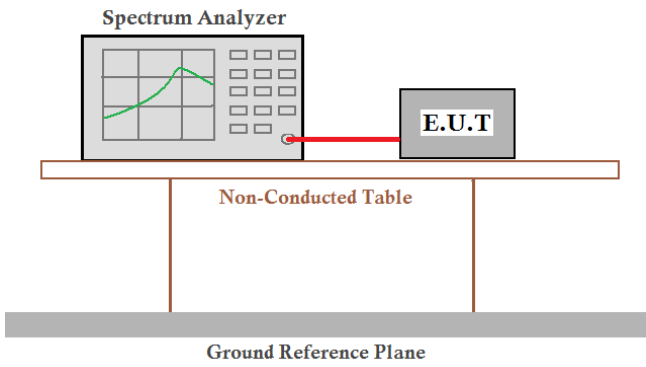
Average value:

Frequency (MHz)	Read Level (dBuV/m)	Correction Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.00	58.74	-15.40	43.34	54.00	-10.66	Horizontal
2745.00	54.27	-12.56	41.71	54.00	-12.29	Horizontal
3660.00	51.17	-10.32	40.85	54.00	-13.15	Horizontal
4757.00	49.01	-8.64	40.37	54.00	-13.63	Horizontal
5490.00	38.96	-6.70	32.26	54.00	-21.74	Horizontal
6405.00	---	---	---	---	---	Horizontal
1830.00	57.82	-15.40	42.42	54.00	-11.58	Vertical
2745.00	52.78	-12.56	40.22	54.00	-13.78	Vertical
3660.00	44.83	-10.32	34.51	54.00	-19.49	Vertical
4757.00	43.32	-8.64	34.68	54.00	-19.32	Vertical
5490.00	38.29	-6.70	31.59	54.00	-22.41	Vertical
6405.00	---	---	---	---	---	Vertical

Remark:

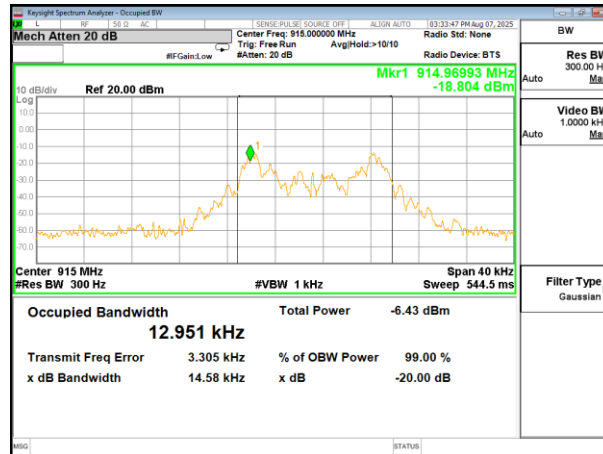
1. Final Level =Receiver Read level +Correction Factor(Antenna Factor + Cable Loss – Preamplifier Factor)
2. The emission levels of other frequencies are more than 20 dB below the limit and not show in test report.
3. “-”, means this data is the too weak instrument of signal is unable to test.

4.4 20dB Bandwidth and 99% bandwidth

Test Requirement :	CFR 47 part 15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.	
Test Method :	ANSI C63-2020 § 6.9.3	
Limit:	/	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an Equipment Under Test (E.U.T.). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.3°C	Humid.: 63%RH
Test voltage:	AC 120V /60Hz	
Test results:	Pass	

Measurement Data

Test frequency	20dB bandwidth(KHz)	99% bandwidth(KHz)	Result
915MHz	14.58	12.951	Pass





5 Test Setup Photo

Reference to the file No.: ET-25072691SP for details.

6 EUT Constructional Details

Reference to the file No.: ET-25072691EP and ET-25072691IP for details

-----End-----