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1

FCC REPORT

Application No.: SZEM1211006225RF **Applicant:** Fulcrum Products. Inc

Product Name: Wireless Remote Control LED Lighting System

Model No.(EUT): 30022-308

Add Model No.: 30024-308B, 30024-308, 30023-308B, 30023-308, 30022-308B,

30021-308, 30020-308, 30019-308

FCC ID: R9LML09

Standards: 47 CFR Part 15, Subpart C (2011)

Date of Receipt: 2012-11-16

Date of Test: 2012-11-28 to 2012-12-26

Date of Issue: 2013-03-19

Test Result: PASS *

Authorized Signature:



Jack Zhang EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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



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2 Test Summary

Test Item	Test Requirement	Test method	Result	
	47 CFR Part 15, Subpart C Section	ANIOL 000 40/0000)	D400	
Antenna Requirement	15.203	ANSI C63.10(2009)	PASS	
Field Strength of the	47 CFR Part 15, Subpart C Section	ANICL OCO 10/0000)	DACC	
Fundamental Signal	15.231 (b)	ANSI C63.10(2009)	PASS	
Saurious Emissians	47 CFR Part 15, Subpart C Section	ANCL CC2 10/0000)	PASS	
Spurious Emissions	15.231 (b)/15.209	ANSI C63.10(2009)	PASS	
20dB Bandwidth	47 CFR Part 15, Subpart C Section	ANCI C62 10(2000)	DACC	
200B Bandwidth	15.231 (c)	ANSI C63.10(2009)	PASS	
Dwell Time	47 CFR Part 15, Subpart C Section	ANSI C63.10(2009)	DACC	
Dweii Tillie	15.231 (a)	ANSI Cos. 10(2009)	PASS	

Model No.: 30024-308B, 30024-308, 30023-308B, 30022-308B, 30022-308B, 30022-308, 30021-308, 30020-308, 30019-308

Only the model 30022-308 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being model name, product name and color.



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4 General Information

4.1 Client Information

Applicant:	Fulcrum Products, Inc
Address of Applicant:	5441 SW Macadam Ave, Suite 302

4.2 General Description of EUT

Name:	Wireless Remote Control LED Lighting System
Mode No.:	30024-308B, 30024-308, 30023-308B, 30023-308, 30022-308B,
	30022-308, 30021-308, 30020-308, 30019-308
Sample Type:	Portable production
Operation Frequency:	433.92MHz
Channel Numbers:	1
Modulation Type:	ASK
Antenna Type:	Integral
Power Supply:	6.0V DC (3.0V x 2 "CR2032" button batteries)
Test Voltage:	DC 6.0V

4.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	48% RH
Atmospheric Pressure:	1016 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

4.4 Description of Support Units

The EUT has been tested independent unit.

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4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

VCCI

The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room $(7.5m \times 4.0m \times 3.0m)$ of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical 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 our files. Registration No.: 556682.

Industry Canada (IC)

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.



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4.10 Equipment List

	RE in Chamber				
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2013-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2013-05-17
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0027	2013-05-29
5	Coaxial cable	SGS	N/A	SEL0189	2013-05-29
6	Coaxial cable	SGS	N/A	SEL0121	2013-05-29
7	Coaxial cable	SGS	N/A	SEL0178	2013-05-29
8	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2013-10-24
9	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2013-10-24
10	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2013-05-17
11	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2013-10-24
12	Barometer	ChangChun	DYM3	SEL0088	2013-05-24
13	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
14	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2013-10-24
15	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2013-10-24
16	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2013-05-17
17	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2013-06-04



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	RF connected test				
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2013-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2013-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2013-05-29
5	Coaxial cable	SGS	N/A	SEL0179	2013-05-29
6	Barometer	ChangChun	DYM3	SEL0088	2013-05-24
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2013-05-17
8	Band filter	amideon	82346	SEL0094	2013-05-17
9	POWER METER	R&S	NRVS	SEL0144	2013-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2013-05-17
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2013-10-24

Note: The calibration interval is one year, all the instruments are valid.



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5 Test results and Measurement Data

5.1 Antenna Requirement

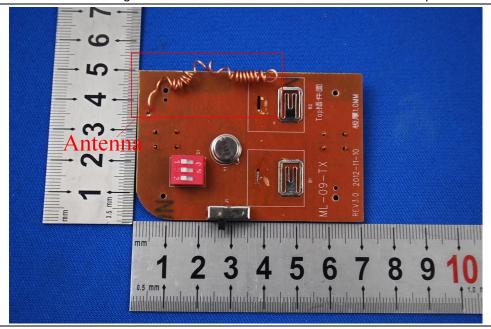
Standard requirement: 47 CFR Part 15C Section 15.203

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 integrated on the main PCB and no consideration of replacement.





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5.2 Spurious Emissions

5.2.1 Spurious Emissions

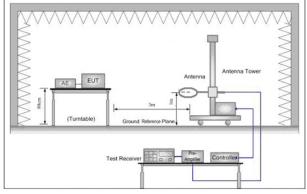
Test Requirement:	47 CFR Part 15C Section 15.231(b) and 15.209							
Test Method:	ANSI C63.10: 2009							
Test Site:	Measurement Distance:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark			
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak			
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average			
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak			
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average			
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak			
	Above 1GHz	Peak	1MHz	3MHz	Peak			
	Above TGHZ	Peak	1MHz	10Hz	Average			
Limit: (Spurious Emissions)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)			
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300			
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30			
	1.705MHz-30MHz	30	-	-	30			
	30MHz-88MHz	100	40.0	Quasi-peak	3			
	88MHz-216MHz	150	43.5	Quasi-peak	3			
	216MHz-960MHz	200	46.0	Quasi-peak	3			
	960MHz-1GHz	500	54.0	Quasi-peak	3			
	Above 1GHz	500	54.0	Average	3			
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total emission level radiated by the device.				sion limit			
Limit:	Frequency	Limit (dBuV/	- I	Remark				
(Field strength of the		80.83		Average Valu	ue			
fundamental signal)	433.92MHz	100.8		Peak Value				

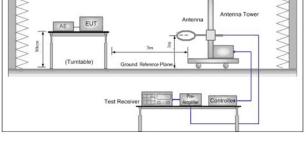


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Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	b. The EUT was set 3 meters away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





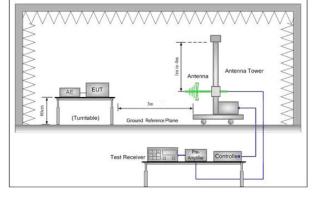


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz



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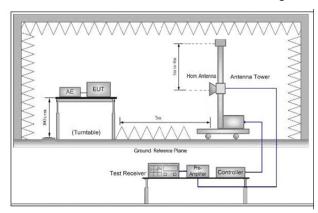


Figure 3. Above 1 GHz

Test Mode:	Transmitting mode
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

Measurement Data

5.2.1.1 Field Strength Of The Fundamental Signal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Peak Level (dBuV/m)	Average Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	2.35	12.1	27.33	73.29	60.41	80.83	-20.42	Horizontal
433.92	2.35	12.1	27.33	60.88	48.00	80.83	-32.83	Vertical

Remark:

As shown in this section, for field strength of the fundamental signal measurements, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above. So, only the peak measurements were shown in the report.

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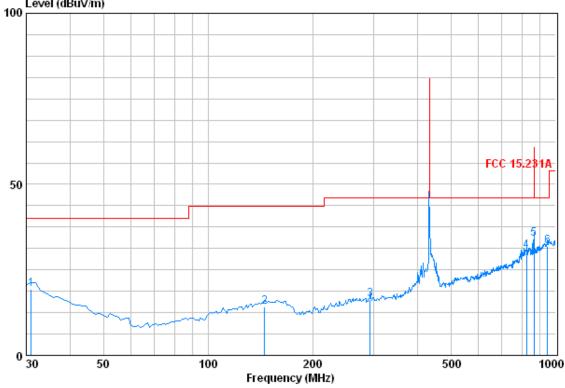
5.2.1.2 Spurious Emissions

Below 1GHz

QP value:

Vertical





Condition : FCC 15.231 A 3m 3142C NEW VERTICAL

Job No. : 6225RF Mode : TX mode

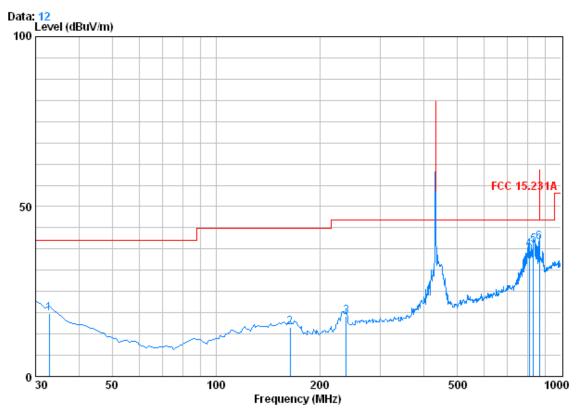
		Cable	lntenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.970	0.60	17.15	27.35	28.94	19.34	40.00	-20.66
2	145.430	1.31	9.00	26.93	30.78	14.15	43.50	-29.35
3	292.870	1.87	9.42	26.42	31.53	16.39	46.00	-29.61
4	824.430	3.31	19.07	27.16	35.29	30.50	46.00	-15.50
5	866.140	3.48	19.40	26.96	38.01	33.93	46.00	-12.07
6	948.590	3.65	21.40	26.54	33.32	31.83	46.00	-14.17



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Horizontal:



Condition : FCC 15.231 A 3m 3142C NEW HORIZONTAL

Job No. : 6225RF Mode : TX mode

		Cablei	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.910	0.60	15.60	27.35	29.73	18.59	40.00	-21.41
2	163.860	1.34	9.50	26.84	30.42	14.42	43.50	-29.08
3	238.550	1.62	8.17	26.57	34.40	17.61	46.00	-28.39
4	807.940	3.24	18.77	27.23	42.66	37.44	46.00	-8.56
5	832.190	3.34	19.08	27.13	43.38	38.66	46.00	-7.34
6 R	866.140	3.48	19.40	26.96	43.62	39.54	46.00	-6.46





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Above 1GHz

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1348.989	2.42	27.85	39.29	49.26	40.24	74	-33.76	Vertical
1759.294	2.69	30.07	39.46	50.14	43.44	74	-30.56	Vertical
2026.972	2.85	31.83	39.58	49.92	45.02	74	-28.98	Vertical
2639.240	3.12	32.89	40.03	49.38	45.36	74	-28.64	Vertical
3365.297	3.62	33.26	40.56	51.32	47.64	74	-26.36	Vertical
4298.004	4.36	34.64	41.26	51.03	48.77	74	-25.23	Vertical
1348.989	2.42	27.85	39.29	49.75	40.73	74	-33.27	Horizontal
1793.602	2.71	30.32	39.48	50.26	43.81	74	-30.19	Horizontal
2200.368	2.91	32.17	39.71	49.70	45.07	74	-28.93	Horizontal
2851.212	3.23	33.19	40.19	50.85	47.08	74	-26.92	Horizontal
3414.398	3.67	33.23	40.61	50.87	47.16	74	-26.84	Horizontal
4503.363	4.49	35.20	41.40	51.04	49.33	74	-24.67	Horizontal

Remark:

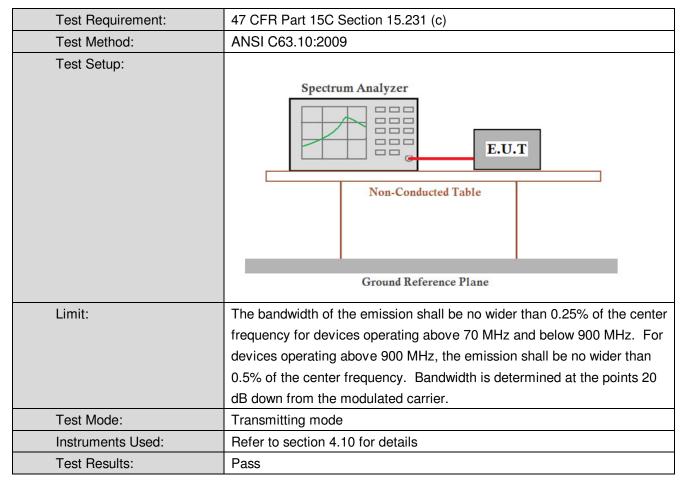
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level = Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 2) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



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5.3 20dB Bandwidth



Measurement Data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.14	1.0848	Pass

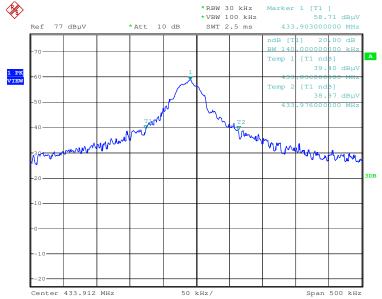
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Test plot as follows:

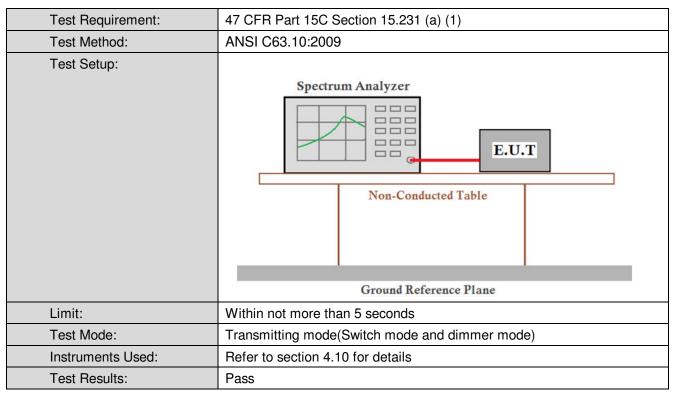




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5.4 Deactivated time



Measurement Data

Test item	Limit (MHz)	Results
Deactivated time	Within not more than 5 seconds	Pass

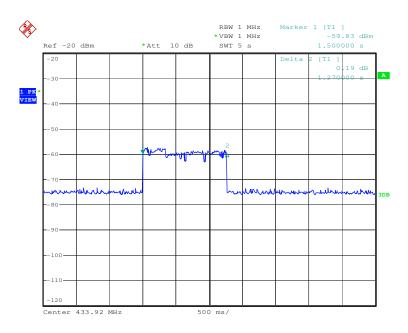


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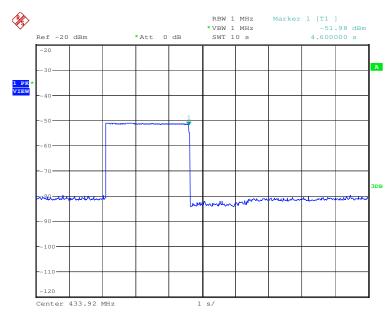
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Test plot as follows:

Switch mode:



Dimmer mode:



Remark:

- 1) For switch mode, press on-off button once, Mark 1 while being release, Mark 2 is the deactivated time point.
- 2) For dimmer mode, press and hold the on button, it transmitted continuously until the button has been released. When the button is released, the transmitter deactivated immediately. Mark 1 is the deactivated time point.

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