FCC TEST REPORT

FCC ID: 2BQTK-DK-US301

On Behalf of

Guangzhou Dikang Information Technology Co., LTD

Rechargeable Spotlight

Model No.: DK-US301

DK-US303, DK-US305, DK-US101, DK-US102, DK-US103

Prepared for	:	Guangzhou Dikang Information Technology Co., LTD
Address	:	Shop 1001, No.152 Huangbian North Road, Baiyun District, Guangzhou

Prepared By	:	Shenzhen PSI Testing Co., Ltd.
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TEST REPORT DECLARATION

Applicant	:	Guangzhou Dikang Information Technology Co., LTD
Address	:	Shop 1001, No.152 Huangbian North Road, Baiyun District, Guangzhou
Manufacturer	:	Zhongshan Chaofu Lighting ., LTD
Address	:	No.19, South Road, Gusan Industrial Zone, Guzhen Town, Zhongshan City, Guangdong Province, China
EUT Description	:	Rechargeable Spotlight
		(A) Model No. : DK-US301 DK-US303, DK-US305, DK-US101, DK-US102, DK-US103
		(B) Trademark : /

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231

ANSI C63.10-2013

Test Result: PASS

The device described above is tested by Shenzhen PSI Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen PSI Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part15 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen PSI Testing Co., Ltd.

Tested by (name + signature).....…..:	Felix Pang Test Engineer	Felix Pang
Approved by (name + signature)…....:	Simple Guan Project Manager	Simple Guan
Date of issue……..:	July 21, 2025	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	July 21, 2025	Initial released Issue	Felix Pang

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Description of Test Item	**Test Requirement**	**Standard Paragraph**	**Results**
Power Line Conducted Emission Test	FCC Part 15	Section 15.207	P
Spurious Emission Test	FCC Part 15	Section 15.231&15.209	P
Occupied bandwidth	FCC Part 15	Section 15.231	P
Transmission time	FCC Part 15	Section 15.231	P
Band edge Requirement	FCC Part 15	Section 15.231	P
Antenna Requirement	FCC Part 15	Section 15.203	P

Note:
1. P is an abbreviation for Pass.
2. F is an abbreviation for Fail.
3. N/A is an abbreviation for Not Applicable.
4. Conclusion determination rules of this report: Unless there are clear provisions on measurement uncertainty in the standard or customer requirements, decision by actual test data without considering measurement uncertainty.
5. Measurement method usage ANSI C63.10-2013.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product Name	:	Rechargeable Spotlight
Model List	:	DK-US301 DK-US303, DK-US305, DK-US101, DK-US102, DK-US103
Diff	:	DK-US301 is tested model, other models are derivative models.The models are identical in circuit, only different on the model names and receiver. So the test data of DK-US301 can represent the remaining models.
Power supply	:	Input: DC 3 V by button battery
Radio technology		SRD
Operation frequency	:	433.92MHz
Channel No.	:	1
Modulation type	:	ASK
Antenna Type	:	PCB antenna, max gain 0dBi
Software version	:	V1.0
Hardware version	:	V1.0
Note	:	Antenna information is provided by applicant. Testing lab is not responsible for the accuracy of the information.

2.2. Accessories of Device (EUT)

Accessories : N/A

Manufacturer : N/A

Model : N/A

Power supply : N/A

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification

2.4. Block Diagram of connection between EUT and simulators

Radiated Emission

EUT

2.5. Test Mode Description

Mode	Channel	Frequency(MHz)
ASK	1	433.92

Note:

1. The test was used to control EUT work in Continuous TX mode, and select test channel, wireless mode
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. New battery is used during all tests.
4. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	26℃
Humidity range:	25-75%	54%
Pressure range:	86-106kPa	101kPa

2.7. Test Facility

Shenzhen PSI Testing Co., Ltd.

1-2/F., Building 5, Yudafu Industrial Park, No.10, Xingye West Road, Shajing Subdistrict, Bao'an District, Shenzhen, Guangdong, China

September 13, 2023 File on Federal Communication Commission
Registration Number: 916281

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	**Uncertainty**
Uncertainty for Power Line Conducted Emissions Test	2.17dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	2.74dB(Polarize: V)
	2.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 18GHz)	4.29dB(Polarize: V)
	4.82dB(Polarize: H)
Uncertainty for radio frequency	48.24KHz
Uncertainty for conducted RF Power	0.41dB
Uncertainty for Power Spectral Density	0.39 dB
Occupied-Bandwidth	968Hz
Conducted-Spurious Emission	1.26dB

2.9. Test Equipment List

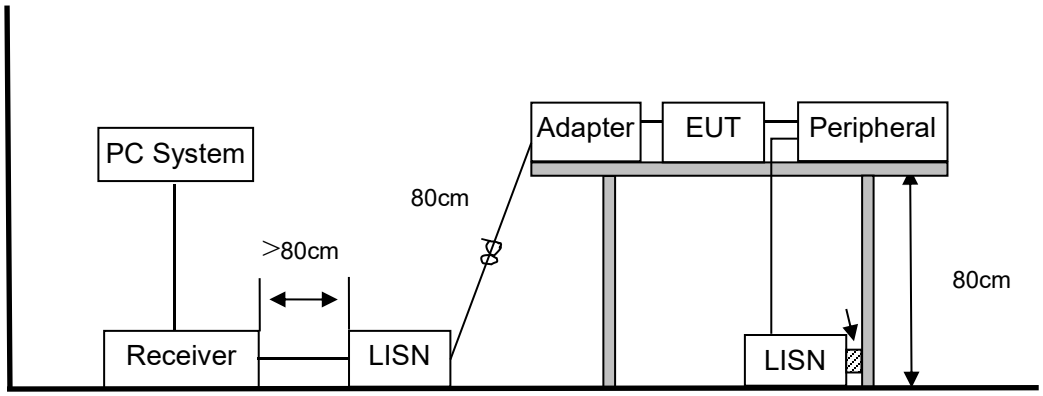
Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	9*6*6 anechoic chamber	SKET	9*6*6	N/A	/	2022.12.20	3 Year
2.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2024.12.18	1 Year
3.	L.I.S.N.#1	Rohde&Schwarz	ENV216	102282	/	2024.12.18	1 Year
4.	L.I.S.N.#2	RFT	NNB111	13835240	/	2024.12.18	1 Year
5.	Loop Antenna	Schwarz beck	FMZB 1519B	00128	/	2025.01.02	2 Year
6.	Bilog Antenna	Schwarz beck	VULB 9168	01448	/	2025.01.02	2 Year
7.	Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101648	3.70	2024.12.18	1 Year
8.	Horn Antenna	Schwarz beck	BBHA 9120 D	02706	/	2025.01.02	2 Year
9.	Amplifier	SKET	LAPA_01G18G-45dB	SK2022032901	/	2024.12.18	1 Year
10.	Horn Antenna	Schwarz beck	BBHA 9170	00946	/	2024.12.31	2 Year
11.	Amplifier	SKET	LNPA_0118G-45	SK2020010801	/	2024.12.18	1 Year
12.	RF Power Probe	Rohde&Schwarz	NRP-Z11	1138.3004.02-1111533-Fz	/	2024.12.18	1 Year
13.	RF Sensor Unit	Tachoy	TR1029-2	20220428P008	/	2024.12.18	1 Year
14.	Spectrum Analyzer	Agilent	N9020A	MY51281067	A.14.03	2024.12.18	1 Year
15.	Temp. & Humid Chamber	Auchno	9606	/	/	2024.12.18	1 Year
16.	Regulated DC Power Supply	Xinouhua	ADC120V10A	202211251638	/	2024.12.18	1 Year
17.	Cable	SKET	Cable-RE-1	#02/#03	/	2024.12.18	1 Year
18.	Cable	SKET	Cable-RE-2	#01	/	2024.12.18	1 Year
19.	Cable	SKET	Cable-RE-3	#04	/	2024.12.18	1 Year
20.	Cable	SKET	Cable-CE-1	A-E-24	/	2024.12.18	1 Year
21.	6dB Attenuator	Schwarzbeck	DGA 9552N 6dB	CK4186	/	2024.12.18	1 Year
22.	Power meter	Agilent	E4419B	GB40202121	/	2024.12.18	1 Year

For Test Software Information

Item	Software Name	Manufacturer	Version
RE	EZ_EMC	Farad	PSI-3A1
CE	EZ_EMC	Farad	PSI-3A1
RF	RTS	TACHOY	V1.0.0

3. Power Line Conducted Emission Test

3.1. Block Diagram of Test Setup



3.2. Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes:
1. Emission level=Read level + LISN factor-Preamp factor + Cable loss
2. * Decreasing linearly with logarithm of frequency.
3. The lower limit shall apply at the transition frequencies.

3.3. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

（1） Setup the EUT as shown as Section 3.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

3.5. Test Procedure

（1） The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.

（2） The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver is set at 9kHz.

（3） The frequency range from 30MHz to 1000MHz was pre-scanned with a Peak detector and all final readings of measurement from Test Receiver are Quasi-Peak and Average values.

（4） The test results are reported on Section 3.6.

3.6. Test Results

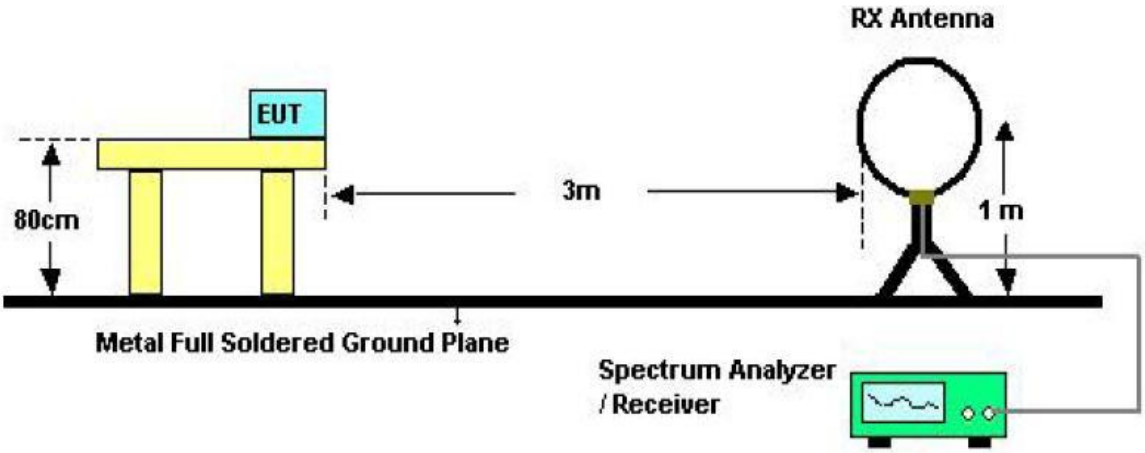
N/A

The EUT is powered by battery (DC 3 V) , the test item is not applicable.

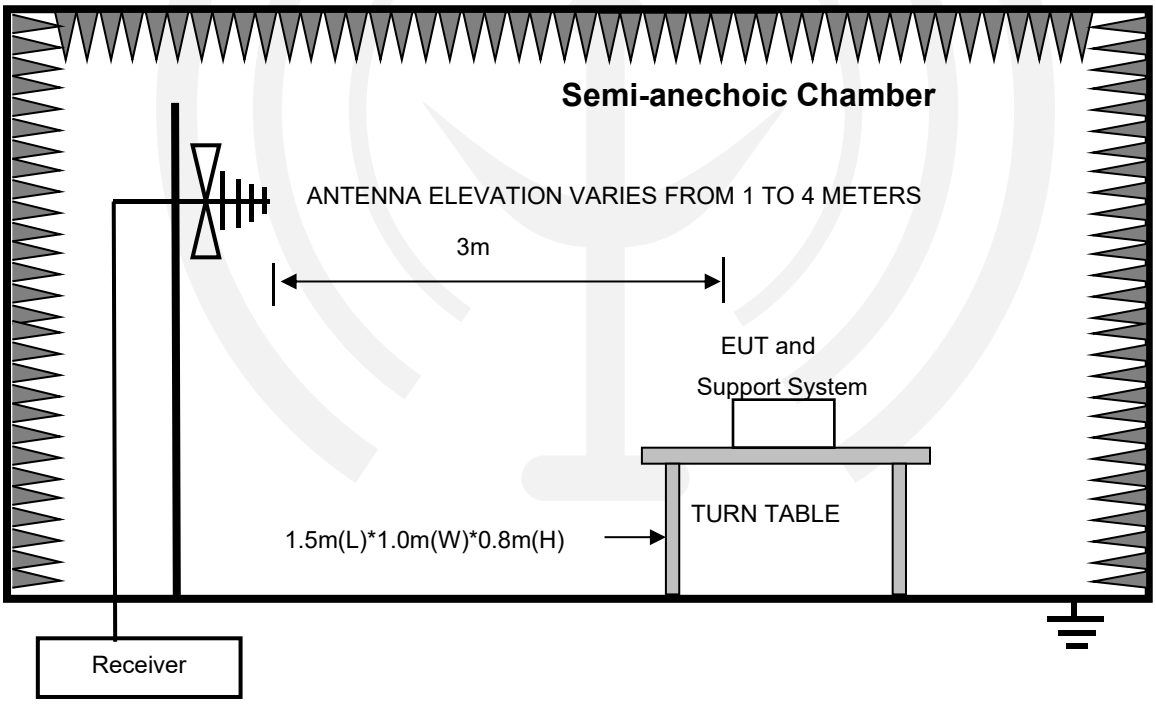
4. Radiated Emission Test and Band Edge Test

4.1. Block Diagram of Test Setup

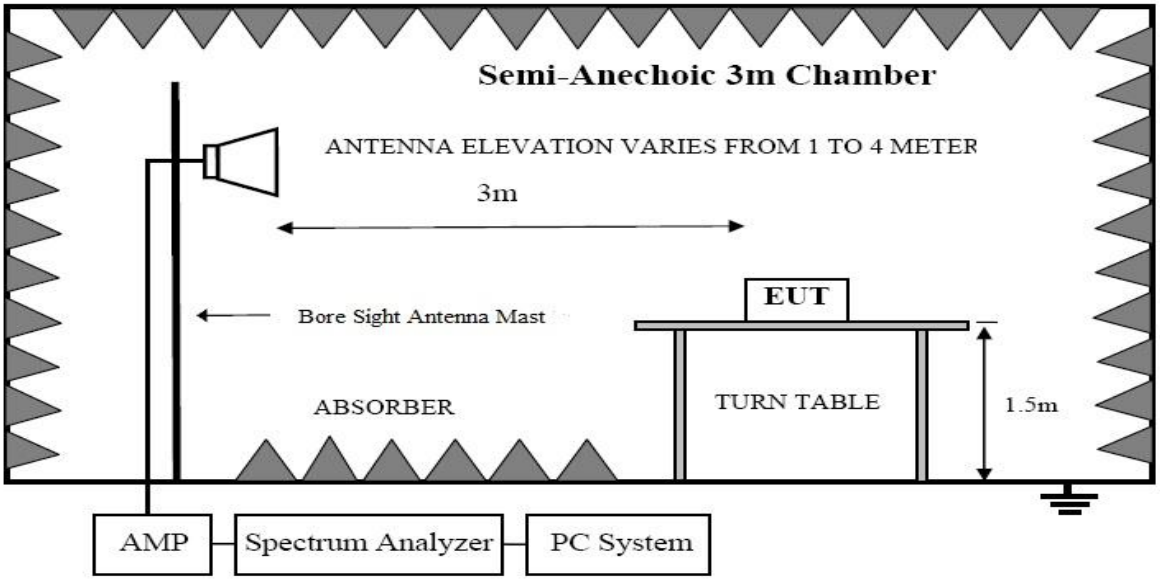
In Semi Anechoic Chamber (3m) Test Setup Diagram for 9KHz~30MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



4.2. Test Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits	
		uV/m	dB uV/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 1.705	30	24000/F(kHz)	----
1.705 30	30	30	29.5
30 88	3	100(3nW)	40
88 216	3	150(6.8nW)	43.5
216 960	3	200(12nW)	46
Above 960	3	500(75nW)	54
Carrier frequency	3	50000(AVG)	113.97(Peak) 93.97(AVG)

Notes:
1. Emission level = Read level + Antenna Factor - Preamp Factor + Cable Loss
2. The smaller limit shall apply at the cross point between two frequency bands.
3. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
4. For frequencies above 1000 MHz, 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.

4.3. Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

4.4. Operating Condition of EUT

（1） Setup the EUT as shown as Section 4.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

4.5. Test Procedure

（1） The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1GHz and 150 cm above the ground plane inside a semi-anechoic chamber for above 1GHz. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10: 2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） Test antenna was located 4m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

（4） For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP

（5） The frequency range from 9KHz to 150KHz is checked, the bandwidth of test receiver is set at 200Hz.

The frequency range from 150KHz to 30MHz is checked, the bandwidth of test receiver is set at 9KHz.

The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver is set at

120kHz.

The frequency range from above 1GHz is checked, the bandwidth of Signal Analyzer is set at 1MHz.

（6） The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

（7） Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.

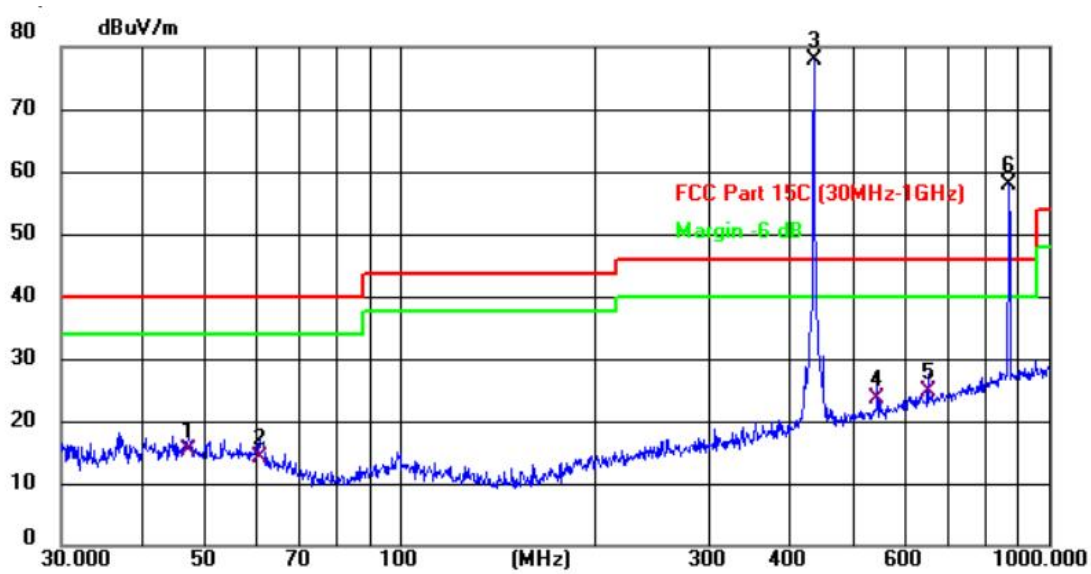
（8） The test results are reported on Section 4.6.

4.6. Test Results

Note: 1. Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Frequency Range	:	**30MHz~1000MHz`**			
EUT	:	Rechargeable Spotlight	Temperature	:	26.3℃
M/N	:	DK-US301	Humidity	:	54.4%
Test Engineer	:	Felix Pang			
Test Mode	:	433.92MHz			
Test Results	:	**PASS**			
Note:	1. The test results are listed in next pages. 2. This mode is worst case mode, and this report only reflected the worst mode. 3. If the limits for the measurement with the quasi-peak detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.				

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	47.1598	24.68	-9.51	15.17	40.00	-24.83	QP
2	60.7043	24.96	-10.80	14.16	40.00	-25.84	QP
3 *	433.9200	83.06	-5.34	77.72	100.83	-23.11	peak
4	543.2742	26.81	-3.34	23.47	46.00	-22.53	QP
5	651.9417	25.94	-1.35	24.59	46.00	-21.41	QP
6 X	867.8000	55.96	1.90	57.86	80.83	-22.97	peak

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	433.9200	77.72	-12.88	64.84	80.83	-15.99	AVG
2	867.8000	57.86	-12.88	44.98	60.83	-15.85	AVG

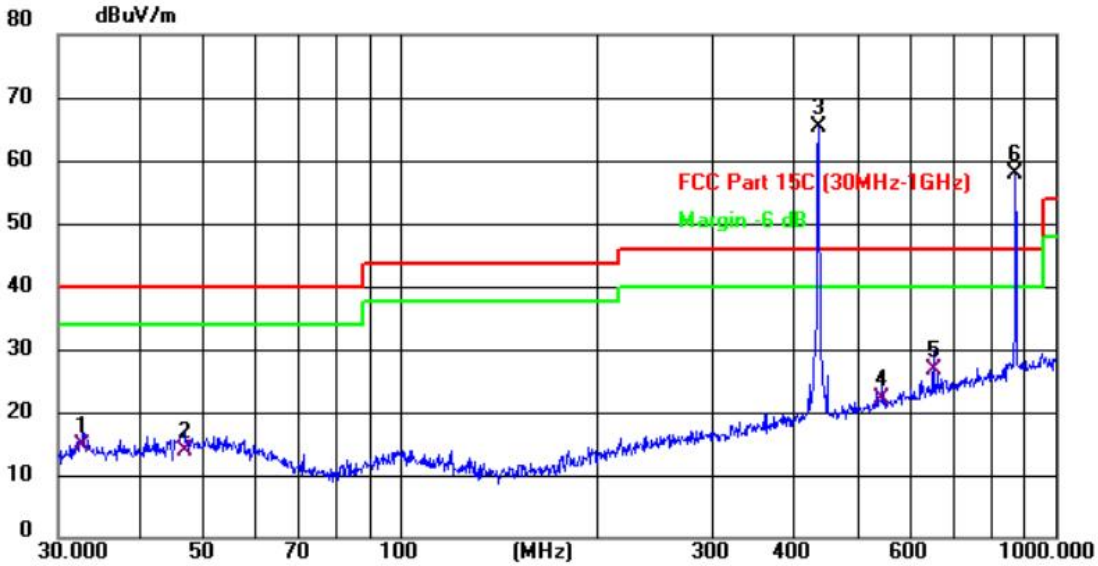
Remark: 1. All readings are Quasi-Peak and Average values.

2. Margin = Result (Result =Reading + Factor)–Limit

3. When peak value applied to AVG limit, the AVG value is not calculated.

4. Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	32.7486	25.85	-11.15	14.70	40.00	-25.30	QP
2	46.8302	23.42	-9.54	13.88	40.00	-26.12	QP
3 *	433.9200	70.74	-5.34	65.40	100.83	-35.43	peak
4	543.2742	25.48	-3.34	22.14	46.00	-23.86	QP
5	651.9417	27.95	-1.35	26.60	46.00	-19.40	QP
6 X	867.8000	55.82	1.90	57.72	80.83	-23.11	peak

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	433.9200	65.40	-12.88	52.52	80.83	-28.31	AVG
2	867.8000	57.72	-12.88	44.84	60.83	-15.99	AVG

Remark: 1. All readings are Quasi-Peak and Average values.

2. Margin = Result (Result =Reading + Factor)–Limit

3. When peak value applied to AVG limit, the AVG value is not calculated.

4. Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

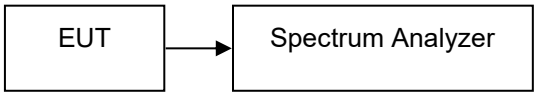
Frequency Range	:	**Above 1GHz**			
EUT	:	Rechargeable Spotlight	Temperature	:	26.3℃
M/N	:	DK-US301	Humidity	:	54.4%
Test Engineer	:	Felix Pang			
Test Mode	:	433.92MHz			
Test Results	:	**PASS**			

Note:
1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.
2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.
3. Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK.
4. Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: Avg.
5. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Limit		Margin dB		Polarization
				PK	AV	PK	AV	
867.84	52.31	-12.88	39.43	74	54	-21.69	-14.57	H
1301.76	43.75	-12.88	30.87	80.8	60.8	-37.05	-29.93	H
1735.68	58.94	-12.88	46.06	80.8	60.8	-21.86	-14.74	H
2169.60	42.13	-12.88	29.25	80.8	60.8	-38.67	-31.55	H
2603.52	48.77	-12.88	35.89	74	54	-25.23	-18.11	H
867.84	43.69	-12.88	30.81	74	54	-30.31	-23.19	V
1301.76	52.14	-12.88	39.26	80.8	60.8	-28.66	-21.54	V
1735.68	46.98	-12.88	34.10	80.8	60.8	-33.82	-26.70	V
2169.60	47.85	-12.88	34.97	80.8	60.8	-32.95	-25.83	V
2603.52	46.34	-12.88	33.46	74	54	-27.66	-20.54	V

5. Occupied Bandwidth Test

5.1. Block Diagram of Test Setup



5.2. Test Limit

Please refer section RSS-210 & 15.231

According to§15.231(C), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

5.3. Test Procedure

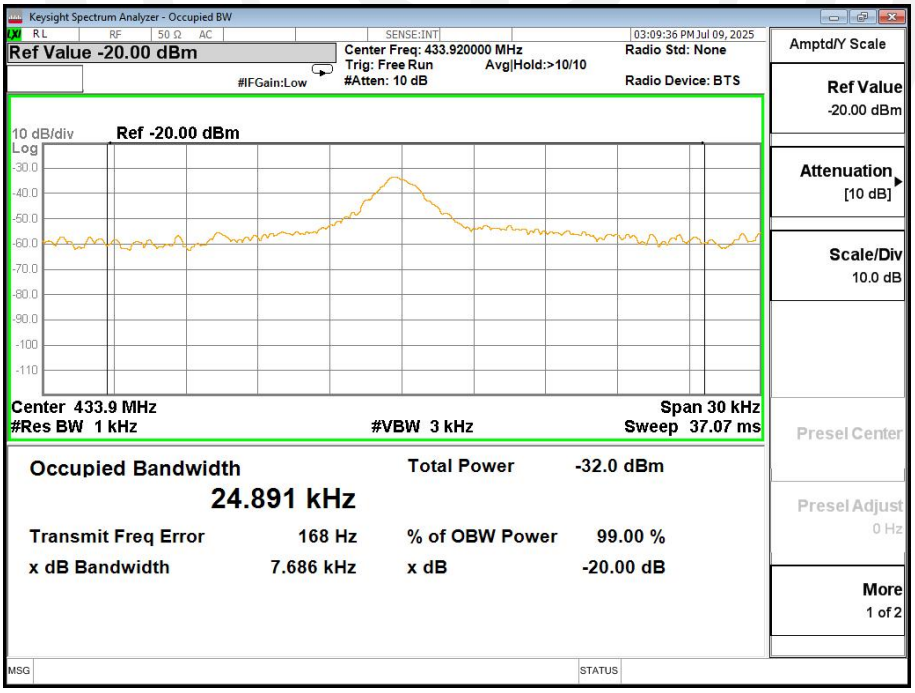
（1） The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

（2） The test receiver RBW set 1kHz, VBW set 3kHz, Sweep time set auto.

5.4. Test Results

Mode	Frequency (MHz)	20dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit(kHz)	Results
ASK	433.92	7.686	24.891	1084.8	Pass

Limit = 433.92MHz *0.25% = 1.0848MHz



6. Transmission time

6.1. Standard Requirement Test limit

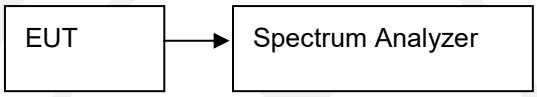
Please refer sectionRSS-210 & 15.231

According to §15.231(a)(1), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

6.2. Method of measurement

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Center= 433.92MHz, Span = 0MHz, Sweep = 10s.
4. Set the spectrum analyzer as RBW=100KHz, VBW=300KHz,
5. Max hold, view and count how many channel in the band

6.3. Test Setup

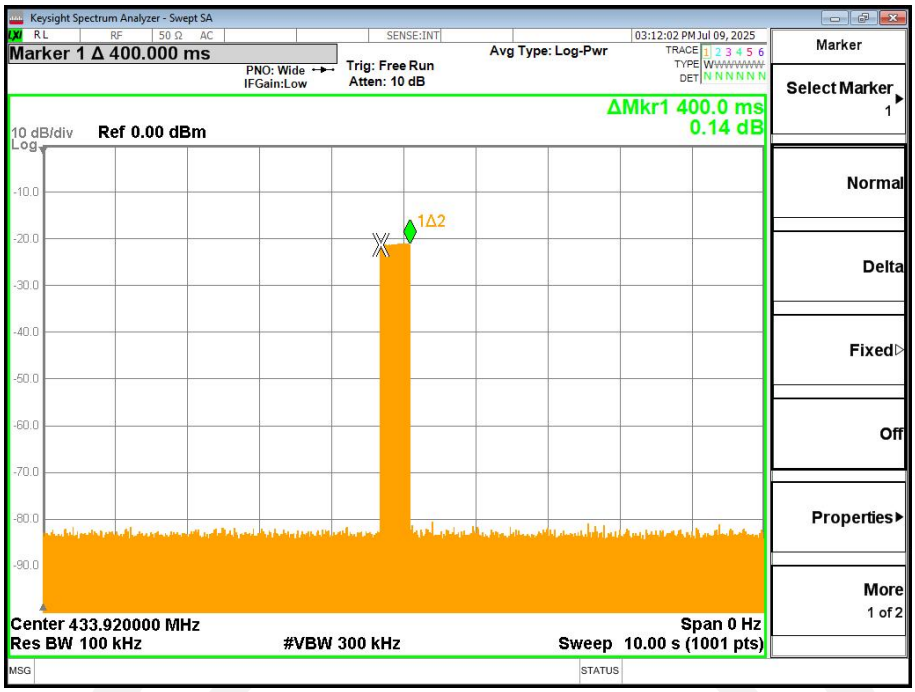


6.4. Results

Freq (MHz)	Test Result(s)	Limit (s)	Conclusion
433.92	0.4	< 5s	PASS

Note: EUT After Release the button, EUT emission Continue 1.302seconds, Compliance with 15.231 a(1) section.

433.92MHz


Keysight Spectrum Analyzer - Swept SA
Marker 1 Δ 400.000 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
03:12:02 PM Jul 09, 2025
ΔMkr1 400.0 ms
0.14 dB
10 dB/div
Ref 0.00 dBm
Log
1Δ2
Center 433.920000 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 10.00 s (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

7. TCALCULATION OF AVERAGE FACTOR

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The duty cycle is measured by placing the spectrum analyzer to set zero span at 0.1MHz resolution bandwidth.

Averaging factor in dB =20log (duty cycle)

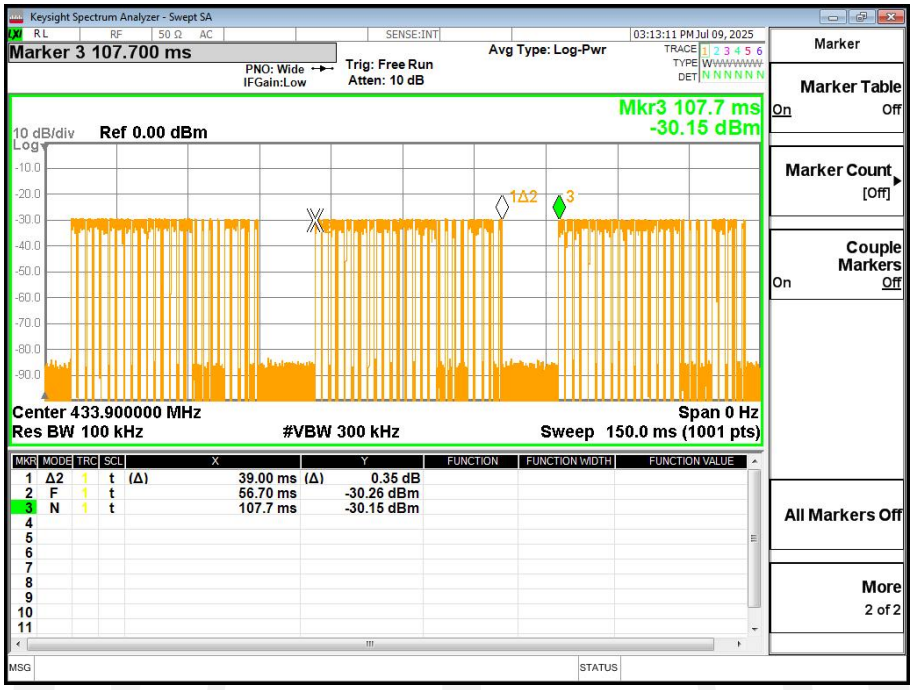
Duty Cycle = (0.3ms*6+1.1ms*19)/(100ms)=0.227

Therefore, the averaging factor is found by 20log0.227=-12.88dB

Test plot as follows:

Note: aperiodic.

Cycle



8. Antenna Requirement

8.1. Standard Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. 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.

8.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 0dBi, and the antenna is fixed antenna no consideration of replacement. Please see EUT photo for details.

8.3. Results

The EUT antenna is PCB Antenna. It complies with the standard requirement.

9. Photos of test setup

Reference to the **appendix I Test Setup Photo** for details.

10. Photos of EUT

Reference to the **appendix II external photos** and **appendix III internal photos** for details.

------ END OF REPORT------