Photometric Test Report

Relevant Standards

☑IES LM-79-2008

☑ANSI C82.77:2017

Prepared For

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Issue Date

2021/10/11

Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v5.0

T8 Two-Foot Linear Replacement Lamps 2-lamp External Driver Lamp-Style Retrofit Kits (UL Type C)				
Requirement Category	**Test Method**	**Requirements**		**Test value**
Luminaire Output (lm)	IES LM-79-2008	1200		1738
Luminaire Efficacy (lm/W)	IES LM-79-2008	120		137.1
Beam Angle	IES LM-79-2008	⩾140		185.1
Total Harmonic Distortion (A%)	ANSI C82.77:2014	20%	120V	8.06%
			277V	9.35%
Power Factor	ANSI C82.77:2014	0.9	120V	0.993
			277V	0.955
Lamp light output (lm)	IES LM-79-2008 CIE 13.3-1995	1200		1733
				1804
Lamp Efficacy (lm/W)	IES LM-79-2008 CIE 13.3-1995	120		135.92
				137.71
Allowable CCTs* (K)	IES LM-79-2008	7 step	3045±175	3014
		7 step	5029±355	5003
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾80		82
				83
Minimum R9	IES LM-79-2008 CIE 13.3-1995	⩾0		4
				7
Minimum Rf	ANSI/IES TM-30-18	⩾70		84
				84
Minimum Rg	ANSI/IES TM-30-18	⩾89		97
				96
IES Rcs,h1	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
				-12%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/9/24	L36T8/830/11P-XT (2N)	B1
			L36T8/850/11P-XT (2N)	B2
2	Goniophotometer Test	2021/9/24	L36T8/830/11P-XT (2N)	B1
3	THD and PF Test	2021/9/24	L36T8/830/11P-XT (2N)	B1
			L36T8/850/11P-XT (2N)	B2

Remark(If any)
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2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

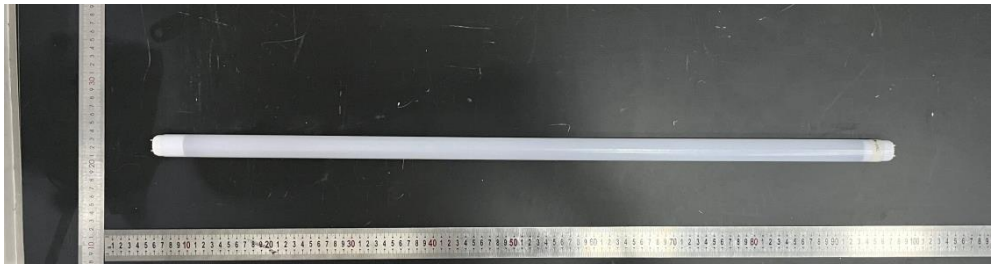
3.0 Production Description

Luminaire Description: L36T8/830/11P-XT (2N)

Electrical Specification: 120-277V,60HZ

Fixture：

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 3000K

Model No.	L36T8/830/11P-XT (2N)	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
277.03	60	0.048	12.8	0.955

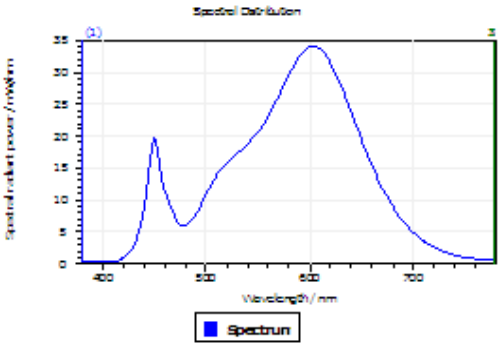
Test Result

CCT (K)	CRI	R9	Duv	THD
3014	82	4	0.00068	9.35%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	97	-12%	1733	135.92

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	583.01 nm
Purity	0.611
PeakWavelength	603.15 nm
Radiant Power	5.048 W
Width50%:	

Color Coordinates

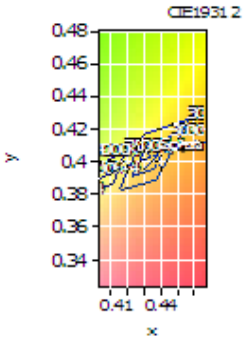
Correlated Color Temperat 3014 K

x: 0.4349 u: 0.2503 u': 0.2503

y: 0.4017 v: 0.3468 v': 0.5201

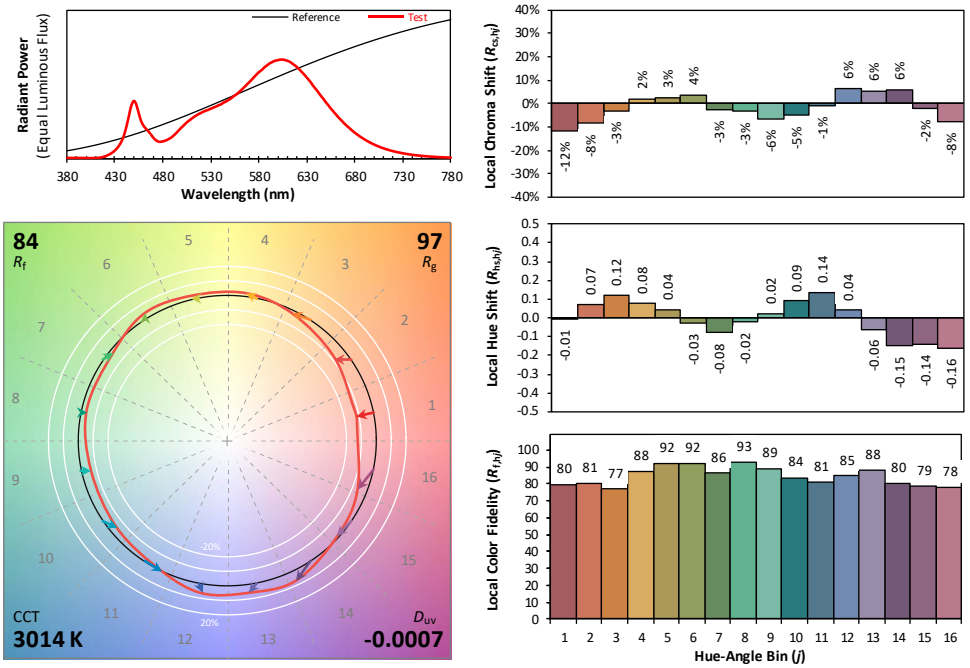
CRI01	80.4	CRI09	4.1
CRI02	90.6	CRI10	78.9
CRI03	96.1	CRI11	80.0
CRI04	80.3	CRI12	71.8
CRI05	80.9	CRI13	82.8
CRI06	88.9	CRI14	98.5
CRI07	81.9	CRI15	72.5
CRI08	57.5	CRI16	70.1

ResultsCRI 82.1



PlanckDistance 6.8E-004

4.1 Integrating Sphere Test



Notes:	This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4349
y	0.4017
u'	0.2503
v'	0.5201

CIE 13.3-1995 (CRI)	
R_a	82
R_9	5

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 5000K

Model No.	L36T8/850/11P-XT (2N)	Sample ID.	B2
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
277.00	60	0.050	13.1	0.955

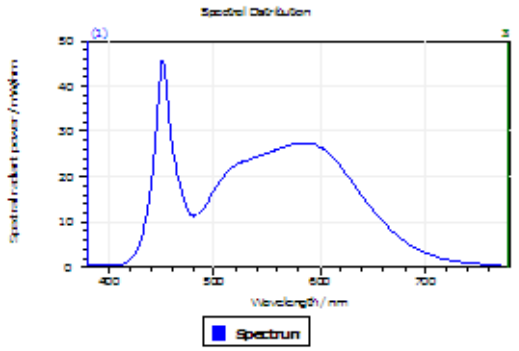
Test Result

CCT (K)	CRI	R9	Duv	THD
5003	83	7	0.0024	9.90%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	96	-12%	1804	137.71

4.1 Integrating Sphere Test

Results



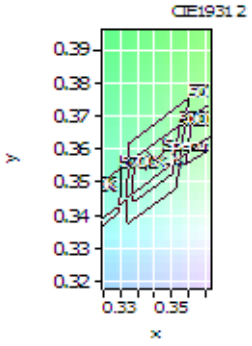
Spectral Distribution

Spectral values

DominantWavelength	570.39 nm
Purity	0.108
PeakWavelength	461.36 nm
Radiant Power	5.392 W
Width50%:	

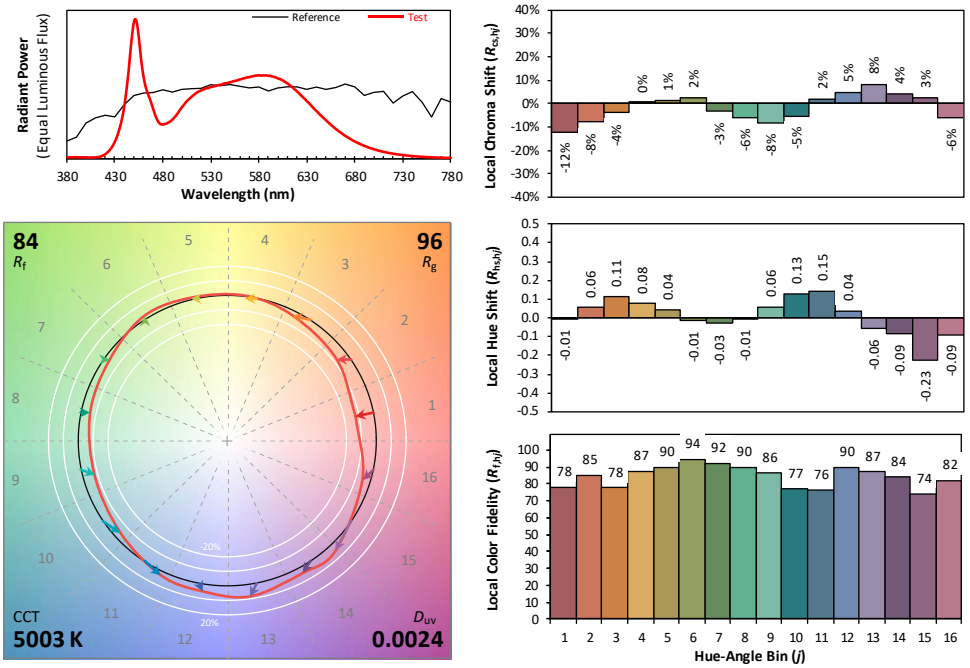
Color Coordinates

Correlated Color Temperat		5003 K			
x:	0.3455	u:	0.2097	u':	0.2097
y:	0.3568	v:	0.3248	v':	0.4873
CRI01		81.5	CRI09		7.1
CRI02		88.7	CRI10		73.2
CRI03		93.5	CRI11		82.6
CRI04		83.1	CRI12		62.5
CRI05		82.5	CRI13		83.4
CRI06		84.3	CRI14		96.7
CRI07		86.6	CRI15		75.6
CRI08		66.7	CRI16		73.6
ResultsCRI		83.4			



PlanckDistance 2.4E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3455
y	0.3568
u'	0.2097
v'	0.4873

CIE 13.3-1995 (CRI)

R_a	83
R_9	7

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test - 3000K

Model No.	L36T8/830/11P-XT (2N)	Sample ID.	B1
Opreate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

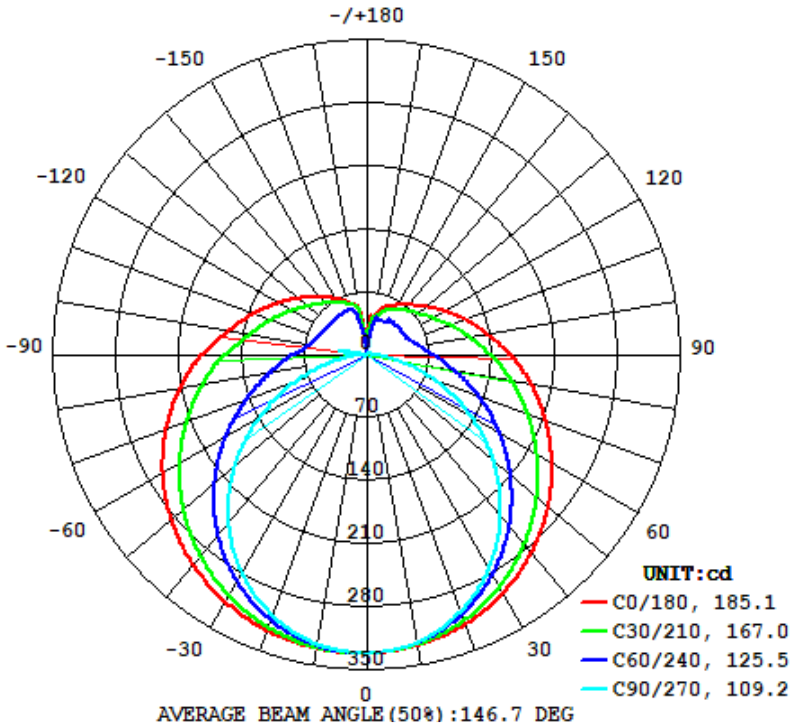
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	277.07	60	0.048	12.7	0.954

Test Result

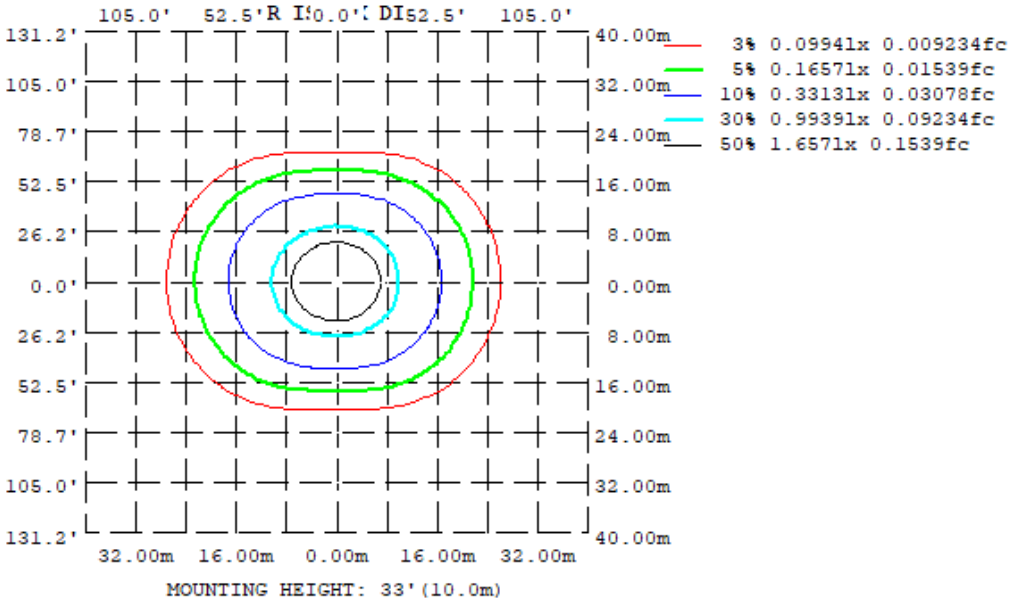
Flux (lm)	Luminous Efficacy (lm/W)	Beam Angle
1738	137.1	185.1

4.2 Goniophotometer Test

Zonal Lumen Summary



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	327.3	325.3	323.8	327.4	331.0	329.0	326.2	327.1	0- 10	31.43	31.43	1.81,1.81
20	318.4	310.8	304.1	315.2	326.1	318.4	308.8	314.3	10- 20	90.93	122.4	7.04,7.04
30	304.6	289.1	273.4	295.7	316.8	300.2	279.8	293.8	20- 30	140.8	263.2	15.1,15.1
40	286.1	261.5	233.1	270.2	303.1	275.6	240.7	267.5	30- 40	176.3	439.5	25.3,25.3
50	263.9	230.3	185.6	240.8	285.1	246.5	193.5	236.8	40- 50	194.5	634.0	36.5,36.5
60	238.9	197.7	133.2	209.3	263.2	214.9	140.1	204.2	50- 60	195.3	829.3	47.7,47.7
70	212.4	165.9	79.25	178.0	238.4	183.3	84.26	172.1	60- 70	181.0	1010	58.1,58.1
80	186.0	137.2	31.70	149.1	211.9	153.7	31.87	142.4	70- 80	156.5	1167	67.1,67.1
90	160.9	113.1	5.320	124.6	185.2	127.7	1.443	117.4	80- 90	129.3	1296	74.6,74.6
100	138.1	94.17	7.223	105.0	158.5	105.3	34.00	97.56	90-100	107.0	1403	80.7,80.7
110	118.0	78.63	7.115	90.25	136.3	91.01	5.321	82.54	100-110	88.92	1492	85.8,85.8
120	100.2	66.99	7.037	79.45	116.6	79.93	1.701	71.63	110-120	72.78	1565	90,90
130	84.95	62.26	5.752	71.53	99.52	71.76	0.5331	64.26	120-130	58.83	1624	93.4,93.4
140	73.45	57.96	3.911	65.95	85.22	65.95	0.5218	59.35	130-140	46.11	1670	96.1,96.1
150	64.40	53.56	1.727	61.55	73.41	62.26	0.4758	52.02	140-150	34.07	1704	98,98
160	56.36	48.09	1.232	57.77	63.60	58.89	0.4829	46.20	150-160	22.12	1726	99.3,99.3
170	43.00	37.65	0.6638	21.62	49.50	39.32	0.4790	21.55	160-170	10.74	1737	99.9,99.9
180	0.3667	0.4641	0.4207	0.3871	0.3591	0.3946	0.4149	0.4313	170-180	1.294	1738	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	L36T8/830/11P-XT (2N)	Sample ID.	B1
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.01	60	0.107	12.7	0.993	8.06%
277.03	60	0.048	12.8	0.955	9.35%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	L36T8/850/11P-XT (2N)	Sample ID.	B2
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.96	60	0.109	13.0	0.994	8.67%
277.00	60	0.050	13.1	0.955	9.90%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

********** End of Test Report**********