

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2017

Prepared For RAB Lighting Inc.

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Project Number

DLF2212110

Report Number

DLF2212110-1a

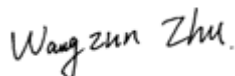
Test Date

2023/1/3

Issue Date

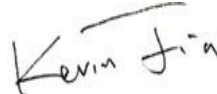
2023/1/5

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.1

Indoor - Linear Ambient - Direct Linear Ambient Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	750		1382
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		691
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	128.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		10.8
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	8.32%
		20.00%	277V	17.19%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.990
		0.9	277V	0.891
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3430
		4 step	3465±124	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		11
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		85
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		95
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		72.24%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22		20.8
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		277
(Goniophotometer - Section 4.2)		Non-Wrost Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		0.044
(Goniophotometer - Section 4.2)		Non-Wrost Case		0.084
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		10.8
(Goniophotometer - Section 4.2)		Non-Wrost Case		9.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/1/3	GUSJR2/10W/3500K	A1
2	Goniophotometer Test	2023/1/3	GUSJR2/10W/3500K	A1
3	THD and PF Test	2023/1/3	GUSJR2/10W/3500K	A1

Remark(If any)

1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.

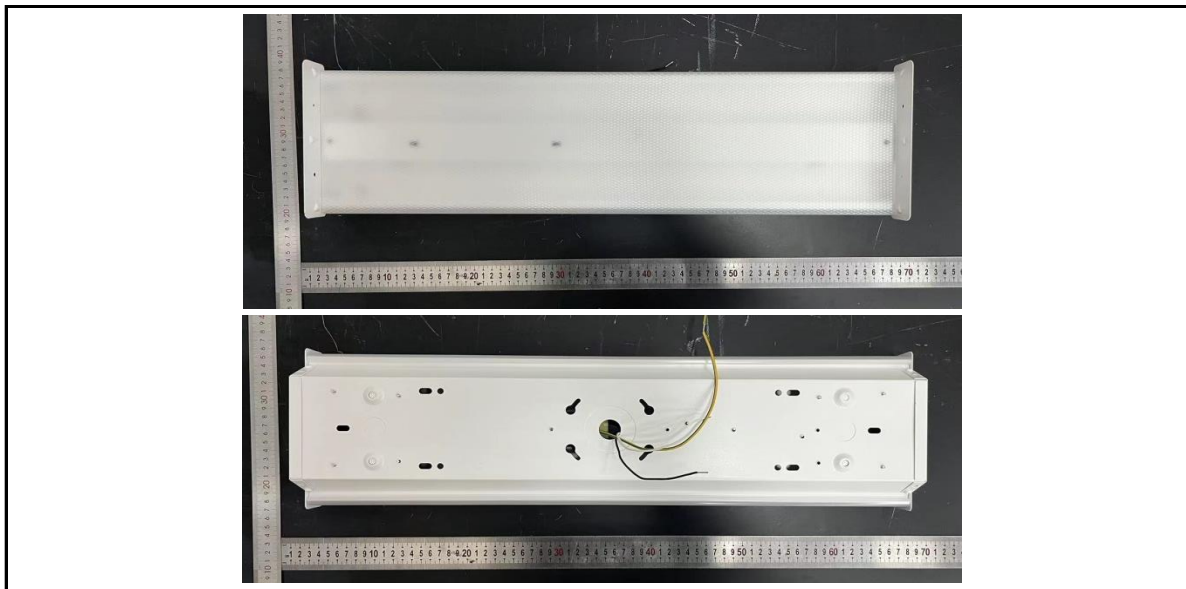
2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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: GUSJR2/10W/3500K

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	GUSJR2/10W/3500K	Sample ID.	A1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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
119.95	60	0.084	10.0	0.990
277.00	60	0.044	10.9	0.891

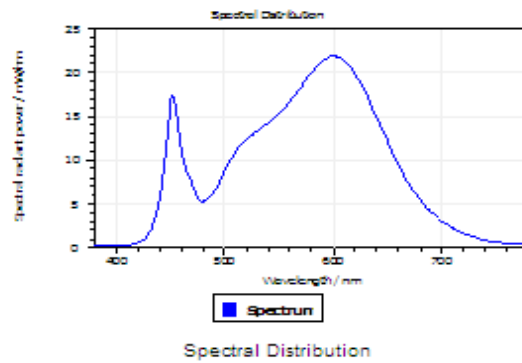
Test Result

CCT (K)	CRI	R9	Duv
3430	84	11	0.0013

Rf	Rg	IES Rcs,h1
85	95	-12%

4.1 Integrating Sphere Test

Results



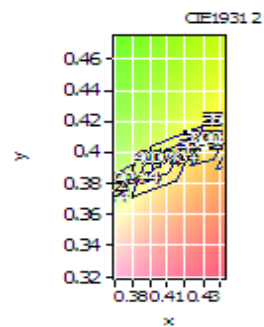
Spectral values

DominantWavelength 580.61 nm
Purity 0.423
PeakWavelength 600.03 nm
Radiant Power 3.511 W
Width50%:

Color Coordinates

Correlated Color Temperat 3430 K
x: 0.4108 u: 0.2369 u': 0.2369
y: 0.3965 v: 0.3430 v': 0.5144

CRI01	82.2	CRI09	11.4
CRI02	90.6	CRI10	78.0
CRI03	96.9	CRI11	82.2
CRI04	82.7	CRI12	65.3
CRI05	82.4	CRI13	84.2
CRI06	87.9	CRI14	98.6
CRI07	85.5	CRI15	75.3
CRI08	63.5	CRI16	72.7
ResultsCRI	84.0		



PlanckDistance 1.3E-003

4.1 Integrating Sphere Test

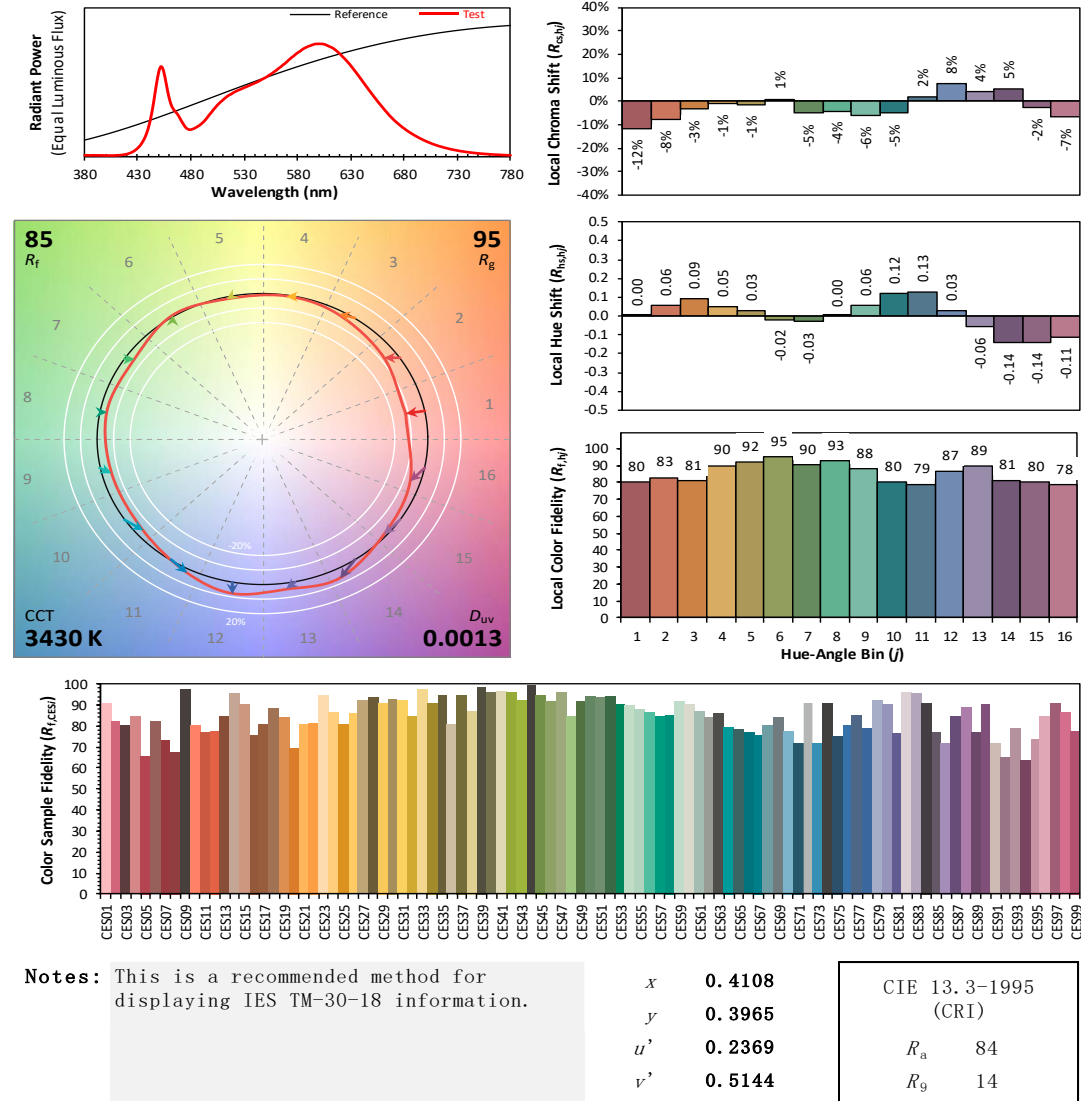
IES TM-30-18 Color Rendition Report

Source: DLF2212110-1a

Manufacturer: RAB Lighting Inc.

Date: 2023/1/3

Model: GUSJR2/10W/3500K



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	GUSJR2/10W/3500K	Sample ID.	A1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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° vertical intervals and 10° horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	277.04	60	0.044	10.8	0.881
NON-WROST CASE	120.01	60	0.084	9.9	0.980

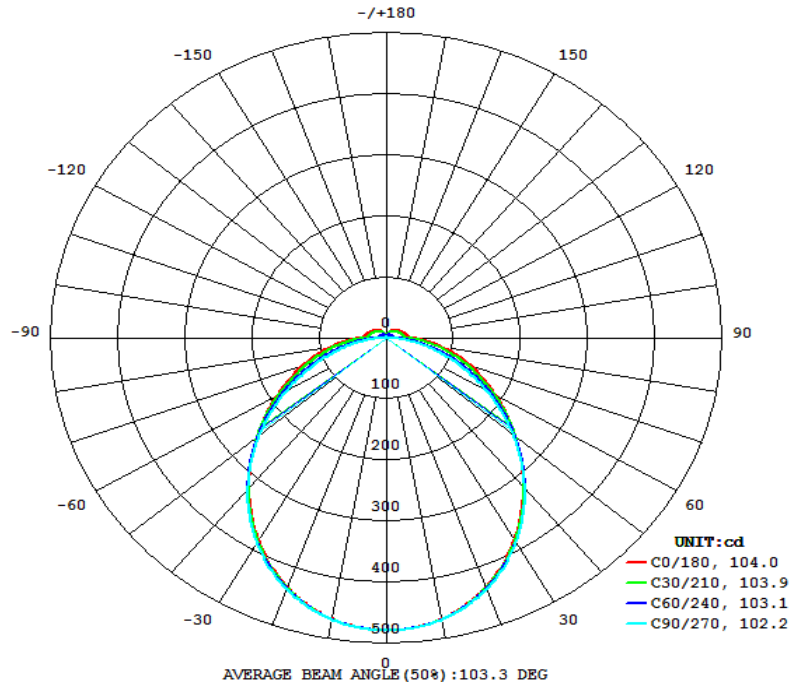
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
1382	175.4	158.2	104.0	102.2	128.0

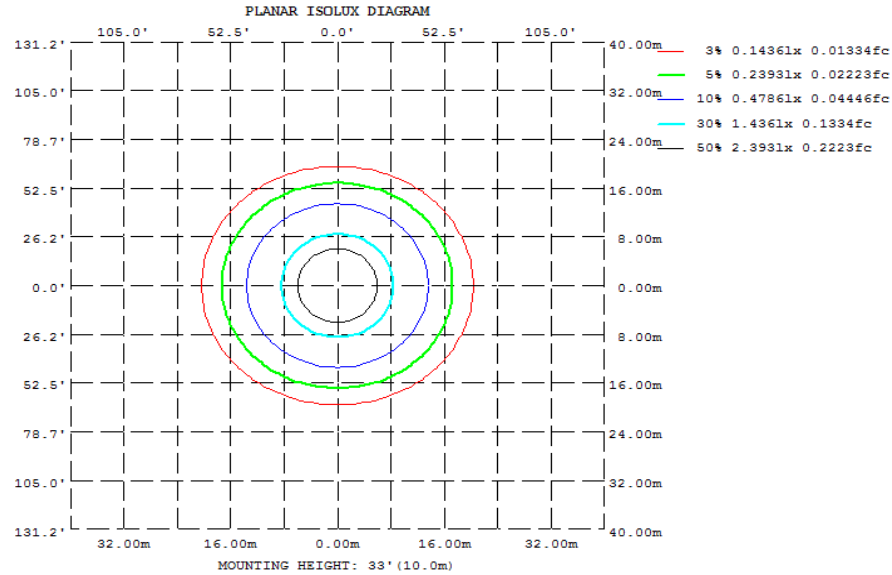
Zonal Lumen Requirement (0° - 60°)	UGR (X=4H, Y=8H, 70/50/20%)	Length(ft)	Lumen/ft
72.24%	20.8	2.00	691

4.2 Goniophotometer Test

Light Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	467.3	467.8	468.1	467.8	467.3	467.8	468.1	467.8
20	434.0	435.7	437.3	435.7	434.0	435.7	437.3	435.7
30	381.6	385.2	386.8	385.2	381.6	385.2	386.8	385.2
40	318.7	321.5	321.5	321.5	318.7	321.5	321.5	321.5
50	252.7	251.9	247.7	251.9	252.7	251.9	247.7	251.9
60	189.4	183.3	173.1	183.3	189.4	183.3	173.1	183.3
70	133.4	120.6	102.9	120.6	133.4	120.6	102.9	120.6
80	84.06	66.65	43.06	66.65	84.06	66.65	43.06	66.65
90	39.94	24.91	0.2164	24.91	39.94	24.91	0.2164	24.91
100	33.65	21.20	0.8918	21.20	33.65	21.20	0.8918	21.20
110	29.47	18.99	1.410	18.99	29.47	18.99	1.410	18.99
120	25.52	16.70	2.166	16.70	25.52	16.70	2.166	16.70
130	21.58	14.60	2.891	14.60	21.58	14.60	2.891	14.60
140	17.92	12.51	3.515	12.51	17.92	12.51	3.515	12.51
150	14.10	9.764	3.956	9.764	14.10	9.764	3.956	9.764
160	9.811	7.252	4.074	7.252	9.811	7.252	4.074	7.252
170	5.588	4.406	3.199	4.406	5.588	4.406	3.199	4.406
180	1.490	2.675	2.970	2.675	1.490	2.675	2.970	2.675
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected										
Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size										
X=2H Y=2H										
UGR Viewed Crosswise						UGR Viewed Endwise				
3H	14.7	16.2	15.2	16.7	17.1	15.4	16.9	15.9	17.4	17.9
4H	16.2	17.5	16.7	18.0	18.5	17.5	18.8	18.0	19.3	19.8
6H	16.7	18.0	17.2	18.4	19.0	18.4	19.7	18.9	20.2	20.7
8H	17.0	18.2	17.5	18.7	19.3	19.3	20.5	19.8	21.0	21.5
12H	17.1	18.2	17.6	18.8	19.3	19.7	20.8	20.2	21.3	21.9
4H	17.1	18.2	17.7	18.7	19.3	20.1	21.2	20.6	21.7	22.3
2H	15.4	16.6	15.9	17.1	17.7	15.9	17.2	16.4	17.7	18.2
3H	17.1	18.2	17.6	18.7	19.2	18.2	19.3	18.7	19.8	20.4
4H	17.7	18.7	18.2	19.2	19.8	19.3	20.3	19.8	20.8	21.4
6H	18.1	19.0	18.7	19.6	20.2	20.4	21.2	20.9	21.8	22.4
8H	18.3	19.1	18.8	19.6	20.2	20.8	21.6	21.4	22.2	22.8
12H	18.3	19.0	18.9	19.6	20.3	21.3	22.1	21.9	22.7	23.3
4H	18.1	18.9	18.7	19.5	20.1	19.5	20.3	20.1	20.9	21.5
6H	18.7	19.4	19.3	20.0	20.6	20.8	21.4	21.4	22.0	22.7
8H	18.9	19.5	19.5	20.1	20.8	21.4	22.0	22.0	22.6	23.2
12H	19.0	19.5	19.6	20.1	20.9	22.0	22.5	22.6	23.1	23.9
4H	18.2	18.9	18.8	19.5	20.2	19.5	20.3	20.1	20.9	21.5
6H	18.9	19.5	19.5	20.1	20.7	20.8	21.4	21.4	22.0	22.7
8H	19.1	19.6	19.7	20.2	20.9	21.5	22.0	22.1	22.6	23.3
Maximum UGR = 23.9										

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	45.18	0 - 10	45.18	3.27%
10-20	128.02	0 - 20	173.20	12.53%
20-30	189.75	0 - 30	362.95	26.26%
30-40	221.27	0 - 40	584.22	42.26%
40-50	220.84	0 - 50	805.06	58.24%
50-60	193.47	0 - 60	998.53	72.24%
60-70	148.52	0 - 70	1147.05	82.98%
70-80	96.44	0 - 80	1243.49	89.96%
80-90	45.54	0 - 90	1289.03	93.25%
90-100	22.47	0 - 100	1311.50	94.88%
100-110	19.39	0 - 110	1330.89	96.28%
110-120	16.23	0 - 120	1347.12	97.45%
120-130	12.96	0 - 130	1360.08	98.39%
130-140	9.71	0 - 140	1369.79	99.09%
140-150	6.65	0 - 150	1376.44	99.57%
150-160	3.86	0 - 160	1380.30	99.85%
160-170	1.68	0 - 170	1381.98	99.98%
170-180	0.34	0 - 180	1382.32	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	117	117	117	117	114	114	114	114	107	107	107	101	101	101	96	96	96	93
1	107	102	97	93	103	99	95	91	93	90	87	88	86	83	84	81	79	77
2	97	89	82	76	94	86	80	74	81	76	72	77	73	69	73	70	67	64
3	88	78	70	63	85	76	68	62	72	65	60	68	63	58	65	60	56	54
4	81	69	60	54	78	67	59	53	64	57	51	61	55	50	58	53	49	46
5	75	62	53	46	72	60	52	46	57	50	45	55	48	43	52	47	42	40
6	69	56	47	40	67	54	46	40	52	45	39	50	43	38	47	42	37	35
7	64	51	42	36	62	49	41	35	47	40	35	45	39	34	43	38	33	31
8	60	46	38	32	58	45	37	32	43	36	31	42	35	30	40	34	30	28
9	56	42	34	29	54	42	34	28	40	33	28	38	32	28	37	31	27	25
10	52	39	31	26	51	38	31	26	37	30	25	36	29	25	34	29	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	GUSJR2/10W/3500 K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

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 25° C ± 1° 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
119.95	60	0.084	10.0	0.990	8.32%
277.00	60	0.044	10.9	0.891	17.19%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2022/12/26	2023/12/25
DLF108	Auxiliary Lamp	2022/12/26	2023/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF116	AC Power Source	2022/12/26	2023/12/25
DLF113	Power Meter	2022/12/26	2023/12/25
DLF112	Temperature Recorder	2022/12/26	2023/12/25
DLF114	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF101	Goniophotometer	2022/12/26	2023/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF104	AC Power Source	2022/12/26	2023/12/25
DLF507	DC Power Source	2022/12/26	2023/12/25
DLF102	Power Meter	2022/12/26	2023/12/25
DLF111	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF119	Power Meter	2022/12/26	2023/12/25
DLF031	Temperature data logger	2022/12/26	2023/12/25
DLF022	Digital power meter	2022/12/26	2023/12/25
DLF003	Temperature & Humidity Datalogger	2022/12/26	2023/12/25

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