

VISUAL COMFORT & COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700**JN1**-LED930

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CHI-007

ISSUE DATE

8/24/2020

REVISED DATE

None

TEST DATES

08/15/2020 through 08/17/2020.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104349704CHI-007

MODEL NUMBER(s)

700**JNI**-LED930

REPORT RENDERED TO:

VISUAL COMFORT & COMPANY
7400 LINDER AVE
SKOKIE, IL 60077

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. This 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.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01080748-1.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



Ian Smith
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Reviewer:



Jeff Davis
NA Technical Lead
Lighting Division

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SAMPLE INFORMATION

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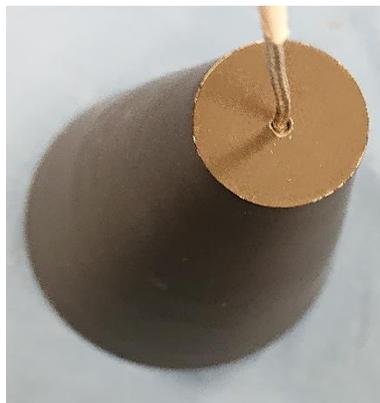
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH08062020034718	700**JN **-LED930	Mini Joni Pendant	Production	8/6/2020

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700**JN **-LED930	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700**JN1**-LED930
Product Description:	Mini Joni Pendant
LED Model No.:	CITIZEN CLU028-1203C4-303H5M3-F1
Driver Model No.:	LTF DA16W150C3337-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	404.4	410.5
Input Power (W) @ 12VAC (Vac)	6.37	6.21
Lumen Efficacy (lm/W)	63.5	66.1
Input Power Factor () @ 12VAC (Vac)	0.929	0.901

Criteria	Results
Input ATHD (%) @ 12VAC (Vac)	47.14
Correlated Color Temperature (K)	2968
Color Rendering Index - Ra ()	91.3
Color Rendering Index - R9 ()	54.1
Duv ()	0.0028
Chromaticity Coordinate (x)	0.443
Chromaticity Coordinate (y)	0.413
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.526

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700**JNJ**--LED930	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

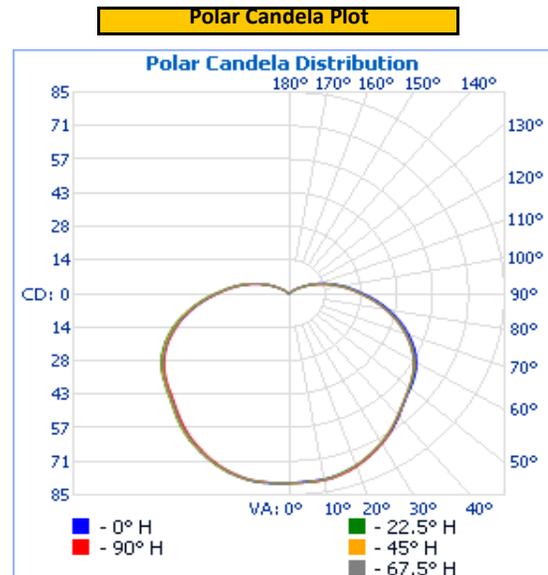
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	12.0	569.8	6.37	0.929

Light Output (lm)	Lumen Efficacy (lm/W)
404.4	63.5

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	80	80	80	80	80
5	80	80	80	80	80
10	80	80	80	80	80
15	79	79	79	79	79
20	77	77	77	77	78
25	75	75	75	75	76
30	73	73	73	73	73
35	70	70	70	70	71
40	67	67	67	67	67
45	64	64	64	64	64
50	62	62	62	62	62
55	60	60	60	60	60
60	58	57	57	57	57
65	54	54	53	53	53
70	50	49	49	49	49
75	45	44	44	44	44
80	40	39	39	39	39
85	35	34	34	33	33
90	29	28	28	28	28
95	25	24	24	24	24
100	20	20	20	19	19
105	16	16	16	15	15
110	13	12	12	12	12
115	9	8	8	8	8
120	6	5	5	5	5
125	3	2	2	2	2
130	1	1	1	1	1
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

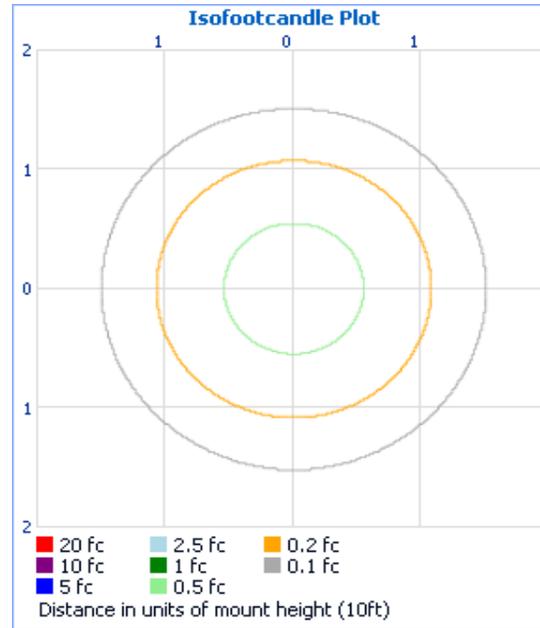
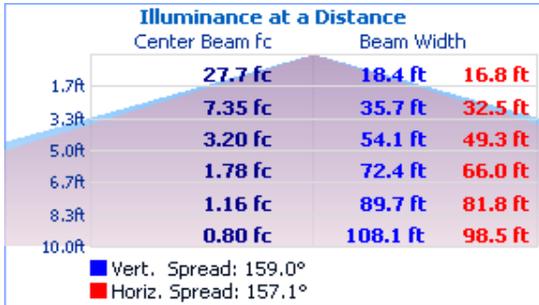
Entire luminous intensity matrix found in .IES file



ILLUMINANCE SUMMARY

Mounting Height: 10ft

Illuminance - Cone Of Light	Isoillumination Plot
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ZONAL LUMENS

Zonal Lumen Summary

Zone	Lumens	Luminaire
0-30	65.0	16.1%
0-40	109.3	27.0%
0-60	213.1	52.7%
60-90	137.0	33.9%
70-100	110.1	27.2%
90-120	51.3	12.7%
0-90	350.1	86.6%
90-180	54.3	13.4%
0-180	404.4	100.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	7.6	1.9%	90-100	26.2	6.5%
10-20	22.4	5.5%	100-110	16.7	4.1%
20-30	35.0	8.6%	110-120	8.3	2.1%
30-40	44.3	11.0%	120-130	2.4	0.6%
40-50	50.1	12.4%	130-140	0.3	0.1%
50-60	53.8	13.3%	140-150	0.1	0.0%
60-70	53.1	13.1%	150-160	0.1	0.0%
70-80	47.0	11.6%	160-170	0.1	0.0%
80-90	36.9	9.1%	170-180	0.0	0.0%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700**JNI**-LED930	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

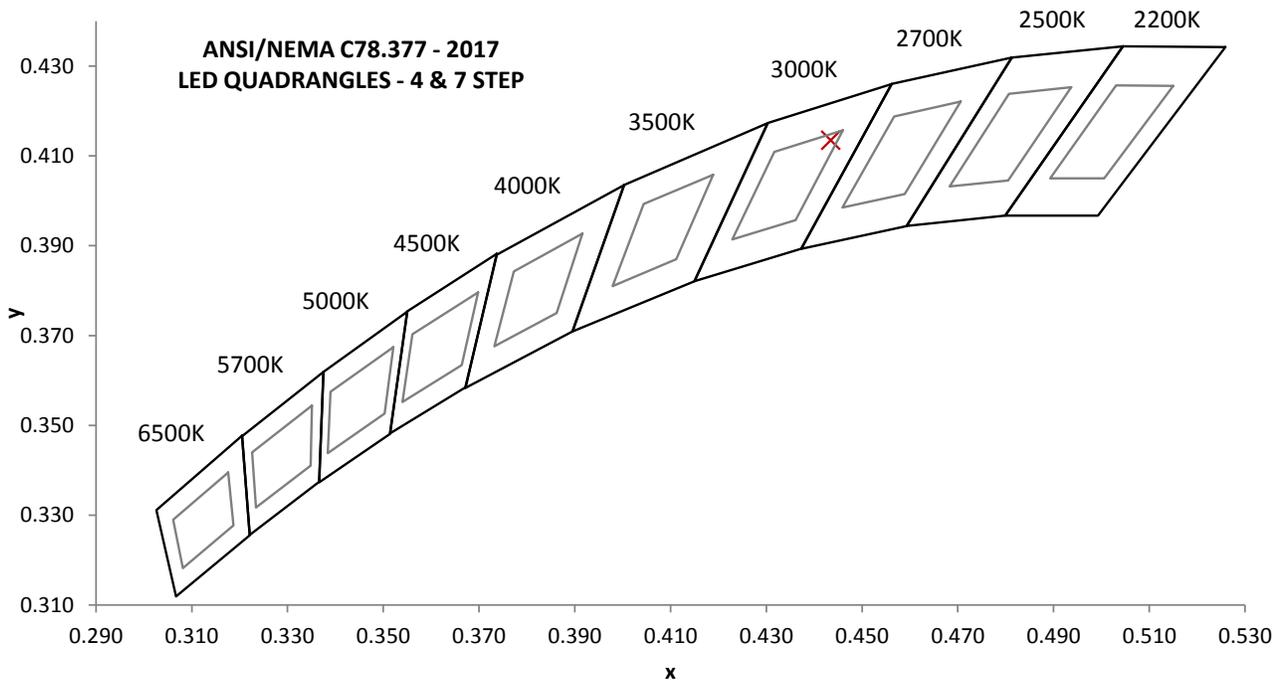
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
12.00	573.3	6.21	0.901	47.14

Measured at 12(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
410.5	66.1	2968	91.3	54.1

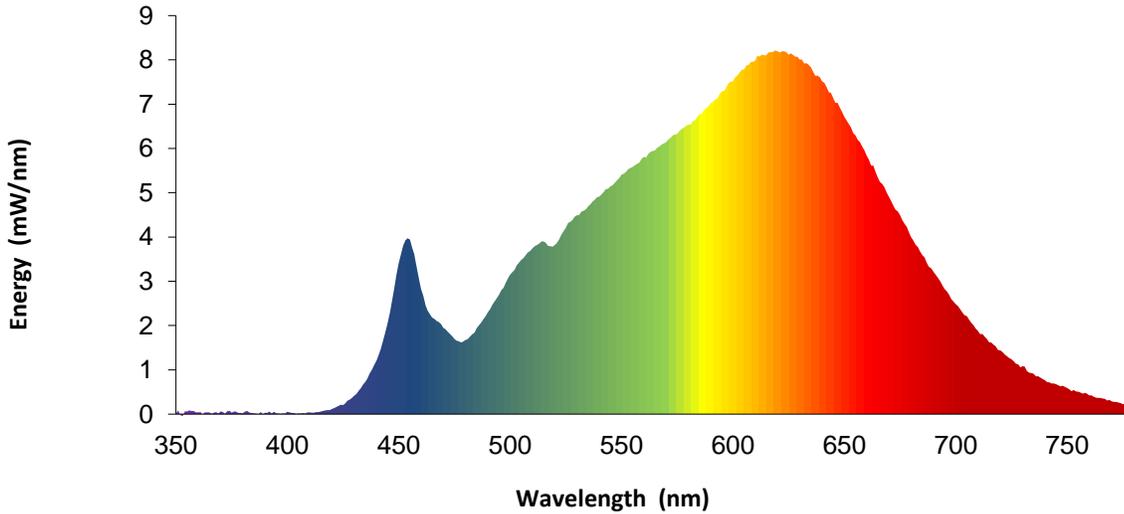
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0028	0.443	0.413	0.251	0.526



SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.0	460	2.8	570	6.1	680	4.0
355	0.1	465	2.2	575	6.3	685	3.6
360	0.0	470	1.9	580	6.5	690	3.2
365	0.0	475	1.7	585	6.8	695	2.8
370	0.1	480	1.7	590	7.0	700	2.5
375	0.0	485	1.9	595	7.3	705	2.2
380	0.0	490	2.3	600	7.5	710	1.9
385	0.0	495	2.7	605	7.8	715	1.6
390	0.0	500	3.1	610	8.0	720	1.4
395	0.0	505	3.5	615	8.1	725	1.2
400	0.1	510	3.7	620	8.2	730	1.1
405	0.0	515	3.9	625	8.1	735	0.9
410	0.0	520	3.8	630	8.0	740	0.8
415	0.1	525	4.2	635	7.8	745	0.7
420	0.1	530	4.5	640	7.5	750	0.6
425	0.2	535	4.7	645	7.1	755	0.5
430	0.4	540	4.9	650	6.7	760	0.4
435	0.7	545	5.1	655	6.3	765	0.4
440	1.2	550	5.4	660	5.8	770	0.3
445	2.1	555	5.6	665	5.4	775	0.2
450	3.4	560	5.8	670	4.9	780	0.2
455	3.9	565	6.0	675	4.5	---	---

Without correction of sample absorption.



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT210	146919	7/1/2020	7/1/2021
2	Omega Thermometer	DPI8-C24	146920	10/3/2019	10/3/2020
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	146957	12/2/2019	12/2/2020
5	Elgar, AC Power Supply	CW1251	146111	VBU	VBU
6	Multi Channel Spectroradiometer	OL770	CHI0092	VBU	VBU
7	Newport Humidity Recorder	iServer	CHI0456	10/11/2019	10/11/2020
8	Labsphere Spectroradiometer	CDS-600	146923	VBU	VBU
9	2M Rotating Sphere	7660-ROT	146923	VBU	VBU
10	Omega thermometer	USB TC08	EQAH002615	4/7/2020	4/7/2021
11	Ametek DC Power Supply	XFR150-8	1468464	VBU	VBU
12	Yokogawa Power Meter	WT210	146880	10/2/2019	10/2/2020
13	Chroma Power Supply	61604	CHI0371	VBU	VBU
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Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
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