

Photometric Test Report

Relevant Standards

- ☒ ANSI/IES LM-79-2019
- ☒ ANSI C82.77-2017

Prepared For

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Issue Date: 2025-02-21

Revised Date: N/A

1.0 Test Summary

DLC Technical Requirements V5.1

Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements		Test Value
Luminaire Output (lm) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	1000		2645
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	108.8
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		24.3
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	13.64
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.991
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3985±275	3928
		4 steps	3985±154	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		84.5
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	N/A		17
Minimum Rf (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥70		84
Minimum Rg (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	≥89		98
IES Rcs,h1 (Integrating Sphere – Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	≥85%		100.0%
Input Voltage (V)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Cast		120.0
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Input Current (A)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		0.204
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		24.3
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A

2.0 Test List

Test Item	Test	Test Date	Model Number	Build Level	Sample No.
1	Integrating Sphere Test	2025-02-20	BULLET2X12 @24W4000K	ES 1st ES #3-3	241216022-S1
2	Goniophotometer Test	2025-02-20	BULLET2X12 @24W4000K	ES 1st ES #3-3	241216022-S1
3	THD and PF Test	2025-02-20	BULLET2X12 @24W4000K	ES 1st ES #3-3	241216022-S1

Remark (If any):

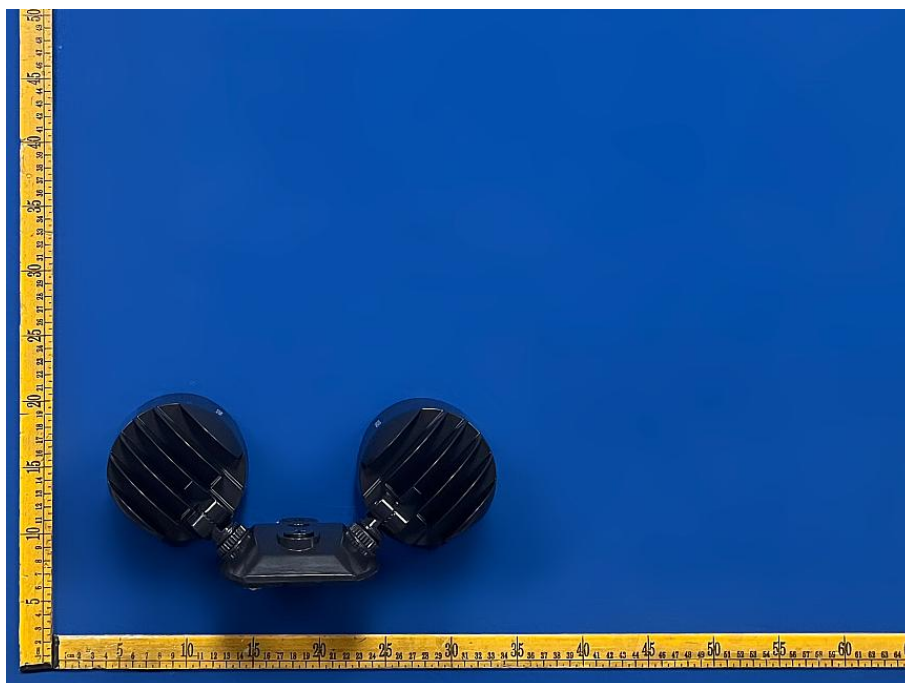
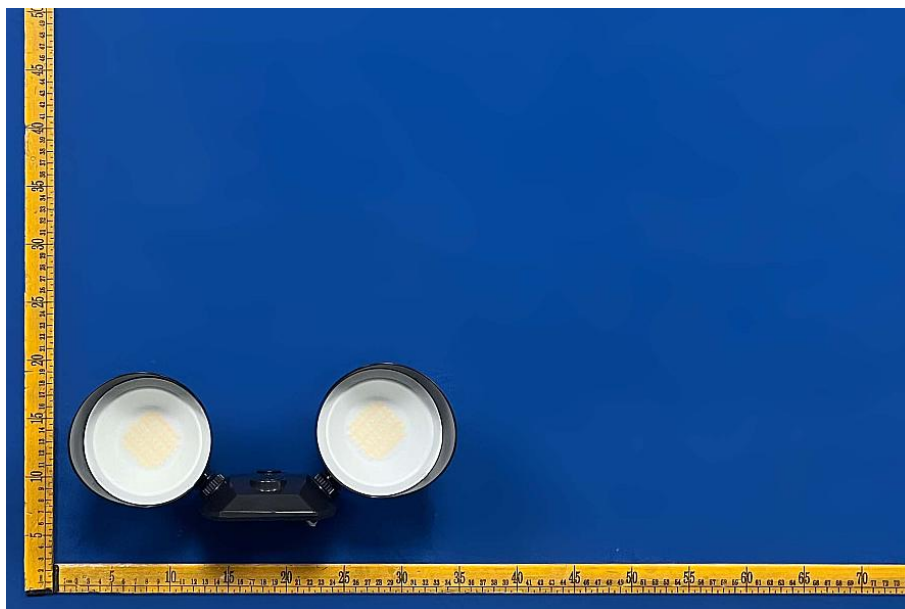
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

3.0 Product Description

Luminaire Description: Model No. BULLET2X12 @24W4000K, color tunable from 3000K, 4000K and 5000K.

Electrical Specification: 120Vac, 60Hz

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	BULLET2X12 @24W4000K	Sample ID	241216022-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

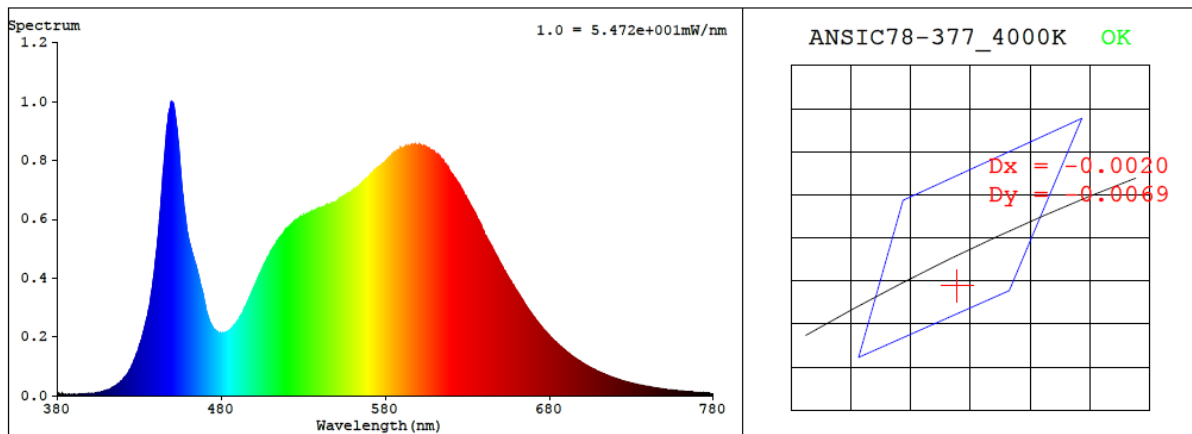
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>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.</p> <p>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 780nm.</p>

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.204	24.3	0.991

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
3928	84.5	17	-0.0027	3.9	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3817$ $y = 0.3719$ / $u' = 0.2279$ $v' = 0.4996$ ($duv = -2.67e-03$)

CCT= 3928K Prcp WL: $L_d = 580.9nm$ Purity=26.2%

Peak WL: $L_p = 449nm$ FWHM: $\approx 21.0nm$ Ratio: R=19.1% G=77.6% B=3.4%

Render Index: $R_a = 84.5$ AvgR = 78.5 TM30: $R_f = 84$ $R_g = 98$

EEL: 0.12515 A+

R1 =84 R2 =90 R3 =93 R4 =85 R5 =84 R6 =86 R7 =87

R8 =68 R9 =17 R10=75 R11=84 R12=65 R13=85 R14=96 R15=79

4.1 Integrating Sphere Test

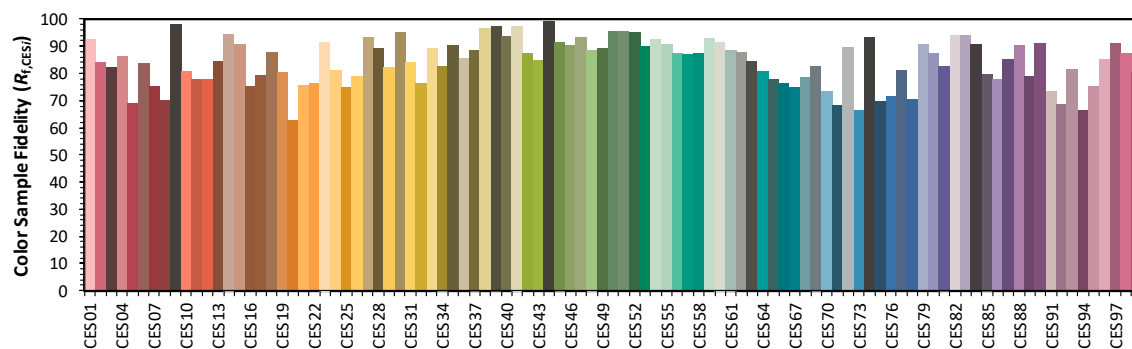
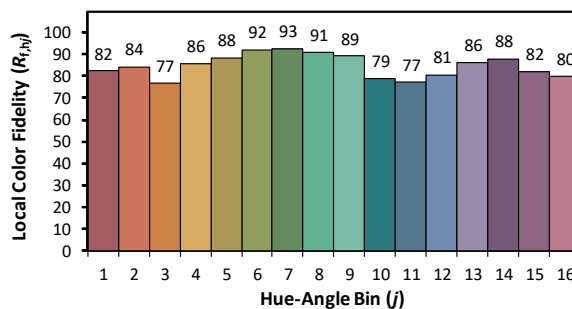
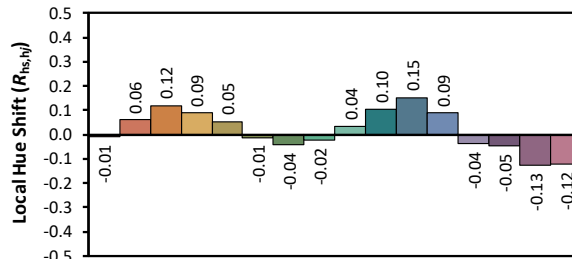
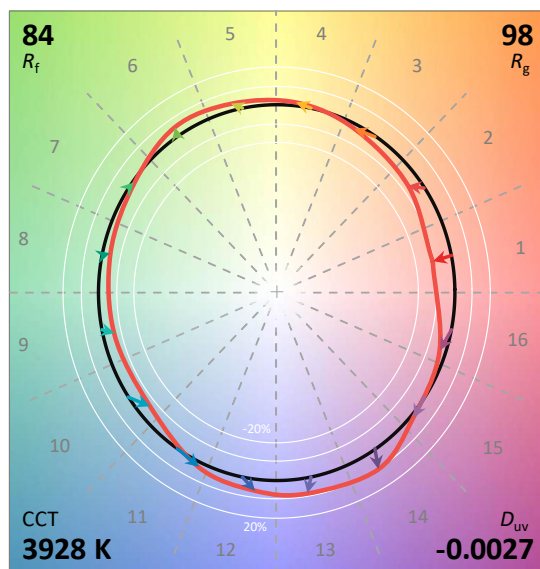
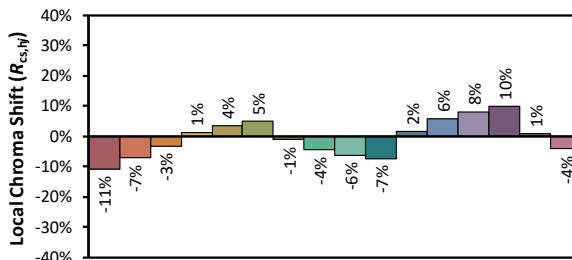
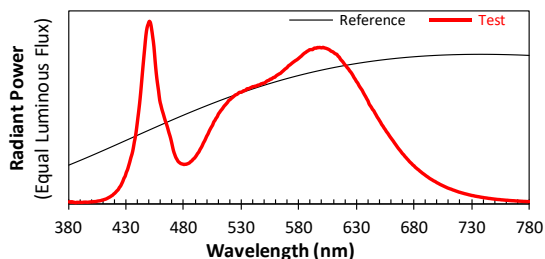
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/2/21

Model: BULLET2X12 @24W4000K



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

x 0.3817
 y 0.3717
 u' 0.2280
 v' 0.4995

CIE 13.3-1995
(CRI)

R_a 85
 R_g 17

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength											
WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)	WL (nm)	Radiant (W/nm)
380	7.00E-06	447	9.18E-04	514	5.23E-04	581	8.01E-04	648	4.72E-04	715	7.04E-05
381	8.00E-06	448	9.61E-04	515	5.32E-04	582	8.06E-04	649	4.63E-04	716	6.79E-05
382	4.90E-06	449	9.81E-04	516	5.39E-04	583	8.12E-04	650	4.53E-04	717	6.57E-05
383	8.40E-06	450	9.97E-04	517	5.46E-04	584	8.18E-04	651	4.43E-04	718	6.35E-05
384	5.00E-06	451	9.88E-04	518	5.53E-04	585	8.23E-04	652	4.31E-04	719	6.11E-05
385	5.10E-06	452	9.53E-04	519	5.63E-04	586	8.27E-04	653	4.23E-04	720	5.96E-05
386	2.40E-06	453	9.08E-04	520	5.67E-04	587	8.32E-04	654	4.12E-04	721	5.76E-05
387	5.30E-06	454	8.57E-04	521	5.73E-04	588	8.35E-04	655	4.03E-04	722	5.59E-05
388	4.50E-06	455	7.81E-04	522	5.78E-04	589	8.40E-04	656	3.93E-04	723	5.41E-05
389	5.10E-06	456	7.13E-04	523	5.84E-04	590	8.41E-04	657	3.85E-04	724	5.23E-05
390	5.00E-06	457	6.60E-04	524	5.89E-04	591	8.42E-04	658	3.75E-04	725	5.08E-05
391	4.50E-06	458	6.16E-04	525	5.94E-04	592	8.42E-04	659	3.66E-04	726	4.92E-05
392	4.70E-06	459	5.65E-04	526	5.96E-04	593	8.49E-04	660	3.57E-04	727	4.76E-05
393	5.90E-06	460	5.38E-04	527	6.01E-04	594	8.50E-04	661	3.49E-04	728	4.59E-05
394	5.90E-06	461	5.13E-04	528	6.06E-04	595	8.49E-04	662	3.40E-04	729	4.46E-05
395	6.20E-06	462	4.92E-04	529	6.08E-04	596	8.53E-04	663	3.30E-04	730	4.27E-05
396	5.20E-06	463	4.70E-04	530	6.09E-04	597	8.52E-04	664	3.22E-04	731	4.19E-05
397	5.90E-06	464	4.49E-04	531	6.12E-04	598	8.54E-04	665	3.13E-04	732	4.06E-05
398	6.40E-06	465	4.31E-04	532	6.17E-04	599	8.52E-04	666	3.04E-04	733	3.90E-05
399	7.70E-06	466	4.10E-04	533	6.17E-04	600	8.52E-04	667	2.96E-04	734	3.80E-05
400	7.20E-06	467	3.87E-04	534	6.22E-04	601	8.54E-04	668	2.88E-04	735	3.67E-05
401	8.40E-06	468	3.67E-04	535	6.28E-04	602	8.51E-04	669	2.80E-04	736	3.59E-05
402	8.80E-06	469	3.43E-04	536	6.27E-04	603	8.50E-04	670	2.71E-04	737	3.46E-05
403	9.10E-06	470	3.15E-04	537	6.30E-04	604	8.48E-04	671	2.65E-04	738	3.34E-05
404	1.01E-05	471	2.87E-04	538	6.33E-04	605	8.45E-04	672	2.57E-04	739	3.23E-05
405	1.17E-05	472	2.68E-04	539	6.36E-04	606	8.42E-04	673	2.50E-04	740	3.15E-05
406	1.26E-05	473	2.51E-04	540	6.39E-04	607	8.38E-04	674	2.43E-04	741	3.02E-05
407	1.34E-05	474	2.40E-04	541	6.39E-04	608	8.33E-04	675	2.36E-04	742	2.94E-05
408	1.48E-05	475	2.29E-04	542	6.42E-04	609	8.31E-04	676	2.28E-04	743	2.86E-05
409	1.71E-05	476	2.24E-04	543	6.42E-04	610	8.27E-04	677	2.22E-04	744	2.76E-05
410	1.85E-05	477	2.19E-04	544	6.46E-04	611	8.21E-04	678	2.17E-04	745	2.65E-05
411	2.08E-05	478	2.16E-04	545	6.48E-04	612	8.18E-04	679	2.10E-04	746	2.61E-05
412	2.24E-05	479	2.15E-04	546	6.50E-04	613	8.15E-04	680	2.05E-04	747	2.50E-05
413	2.53E-05	480	2.12E-04	547	6.54E-04	614	8.06E-04	681	1.98E-04	748	2.42E-05
414	2.87E-05	481	2.14E-04	548	6.56E-04	615	8.01E-04	682	1.93E-04	749	2.34E-05
415	3.22E-05	482	2.14E-04	549	6.58E-04	616	7.90E-04	683	1.87E-04	750	2.25E-05
416	3.55E-05	483	2.16E-04	550	6.58E-04	617	7.82E-04	684	1.83E-04	751	2.19E-05
417	4.01E-05	484	2.18E-04	551	6.63E-04	618	7.76E-04	685	1.77E-04	752	2.11E-05
418	4.37E-05	485	2.22E-04	552	6.69E-04	619	7.67E-04	686	1.72E-04	753	2.05E-05
419	5.02E-05	486	2.28E-04	553	6.72E-04	620	7.58E-04	687	1.66E-04	754	2.02E-05
420	5.50E-05	487	2.33E-04	554	6.74E-04	621	7.52E-04	688	1.62E-04	755	1.95E-05
421	6.19E-05	488	2.41E-04	555	6.80E-04	622	7.42E-04	689	1.57E-04	756	1.86E-05
422	6.87E-05	489	2.46E-04	556	6.80E-04	623	7.36E-04	690	1.52E-04	757	1.83E-05
423	7.51E-05	490	2.54E-04	557	6.85E-04	624	7.26E-04	691	1.48E-04	758	1.76E-05
424	8.64E-05	491	2.63E-04	558	6.89E-04	625	7.19E-04	692	1.44E-04	759	1.71E-05
425	9.43E-05	492	2.73E-04	559	6.90E-04	626	7.10E-04	693	1.39E-04	760	1.64E-05
426	1.07E-04	493	2.81E-04	560	6.97E-04	627	6.99E-04	694	1.35E-04	761	1.63E-05
427	1.21E-04	494	2.94E-04	561	7.02E-04	628	6.87E-04	695	1.31E-04	762	1.56E-05
428	1.37E-04	495	3.04E-04	562	7.05E-04	629	6.78E-04	696	1.27E-04	763	1.49E-05
429	1.48E-04	496	3.16E-04	563	7.09E-04	630	6.67E-04	697	1.23E-04	764	1.45E-05
430	1.69E-04	497	3.30E-04	564	7.12E-04	631	6.59E-04	698	1.20E-04	765	1.41E-05
431	1.83E-04	498	3.41E-04	565	7.19E-04	632	6.47E-04	699	1.16E-04	766	1.38E-05
432	2.05E-04	499	3.55E-04	566	7.24E-04	633	6.36E-04	700	1.12E-04	767	1.35E-05
433	2.26E-04	500	3.69E-04	567	7.30E-04	634	6.27E-04	701	1.09E-04	768	1.28E-05
434	2.51E-04	501	3.80E-04	568	7.36E-04	635	6.18E-04	702	1.05E-04	769	1.24E-05
435	2.71E-04	502	3.95E-04	569	7.40E-04	636	6.05E-04	703	1.02E-04	770	1.22E-05
436	3.00E-04	503	4.07E-04	570	7.46E-04	637	5.94E-04	704	9.92E-05	771	1.17E-05
437	3.37E-04	504	4.18E-04	571	7.54E-04	638	5.83E-04	705	9.60E-05	772	1.14E-05
438	3.68E-04	505	4.29E-04	572	7.57E-04	639	5.71E-04	706	9.32E-05	773	1.09E-05
439	4.14E-04	506	4.45E-04	573	7.62E-04	640	5.61E-04	707	9.00E-05	774	1.08E-05
440	4.66E-04	507	4.54E-04	574	7.68E-04	641	5.44E-04	708	8.73E-05	775	1.01E-05
441	5.17E-04	508	4.66E-04	575	7.73E-04	642	5.34E-04	709	8.41E-05	776	1.00E-05
442	5.75E-04	509	4.74E-04	576	7.77E-04	643	5.25E-04	710	8.19E-05	777	9.80E-06
443	6.43E-04	510	4.89E-04	577	7.82E-04	644	5.14E-04	711	7.94E-05	778	9.30E-06
444	7.16E-04	511	4.97E-04	578	7.85E-04	645	5.07E-04	712	7.75E-05	779	9.20E-06
445	7.86E-04	512	5.07E-04	579	7.90E-04	646	4.95E-04	713	7.50E-05	780	9.20E-06
446	8.52E-04	513	5.14E-04	580	7.95E-04	647	4.84E-04	714	7.24E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET2X12 @24W4000K	Sample ID	241216022-S1
Operate time (Min.)	30	Stabilization time (Min.)	60
Temperature (°C)	24.8	Humidity (%RH)	41.1

Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using a type C goniophotometer and software.</p> <p>The ambient temperature shall be maintained at $25 \pm 1^\circ\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.</p> <p>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.</p> <p>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 1.0° vertical intervals and 15° horizontal intervals.</p>

Test Conditions

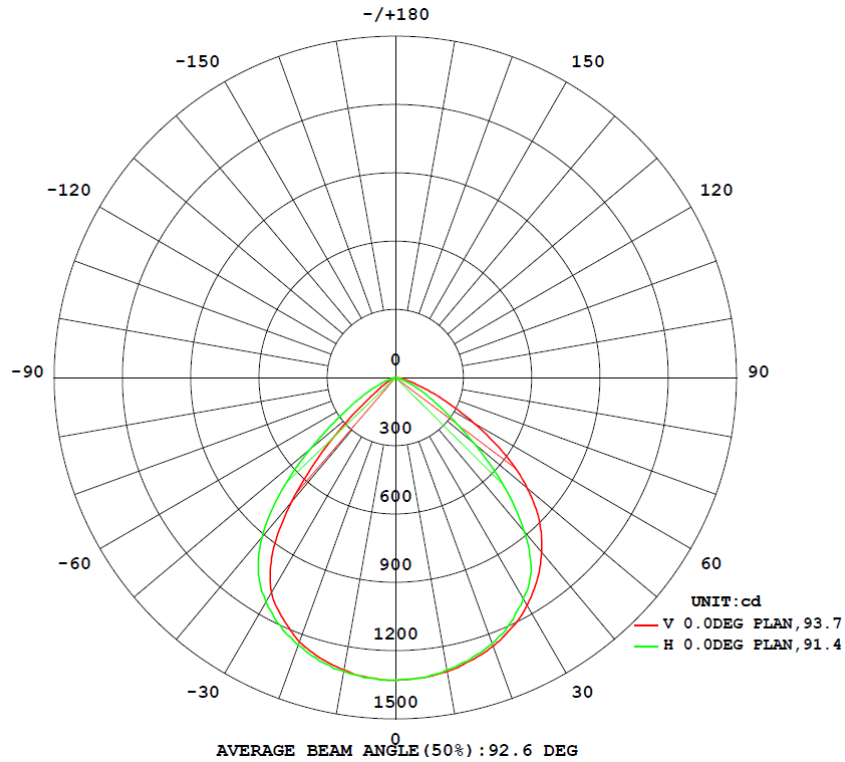
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.204	24.3	0.991
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

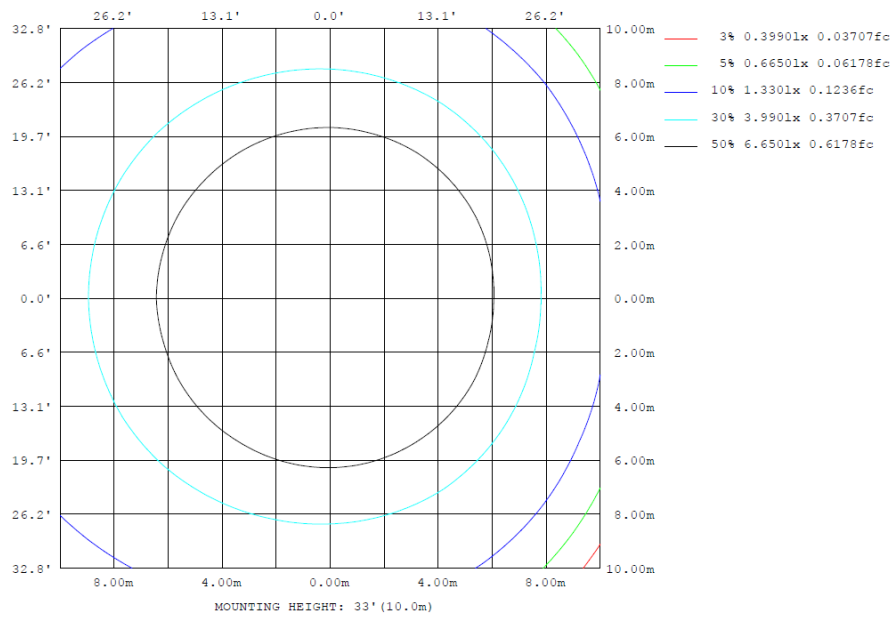
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement	NEMA Type
	C0-180	C90-270	C0-180	C90-270		(0°-90°)	
2645	124.6	126.4	93.3	91.2	108.8	100.0%	6H x 6V

4.2 Goniophotometer Test

Lighting Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	ϕ zone	ϕ total	ϕ lum, lamp
10	1304	1306	1303	1308	1310	1312	1309	1308	0- 10	125.8	125.8	4.76, 4.76
20	1235	1236	1245	1240	1255	1252	1251	1243	10- 20	361.8	487.6	18.4, 18.4
30	1092	1105	1124	1141	1157	1145	1137	1117	20- 30	549.4	1037	39.2, 39.2
40	709.4	803.3	880.3	967.2	1000	986.6	913.2	828.8	30- 40	640.7	1678	63.4, 63.4
50	207.2	334.6	456.5	629.8	758.3	689.1	495.2	379.3	40- 50	534.5	2212	83.6, 83.6
60	48.73	81.03	169.3	261.1	397.5	301.4	181.4	98.74	50- 60	289.1	2501	94.6, 94.6
70	2.886	14.23	47.24	78.76	128.2	84.88	50.83	16.51	60- 70	110.5	2612	98.8, 98.8
80	0.0585	2.239	9.495	13.16	28.87	13.27	10.47	2.795	70- 80	28.75	2641	99.8, 99.8
90	0	0	0	0	0	0	0	0	80- 90	4.274	2645	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	2645	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	2645	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	2645	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	2645	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	2645	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	2645	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	2645	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	2645	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	2645	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

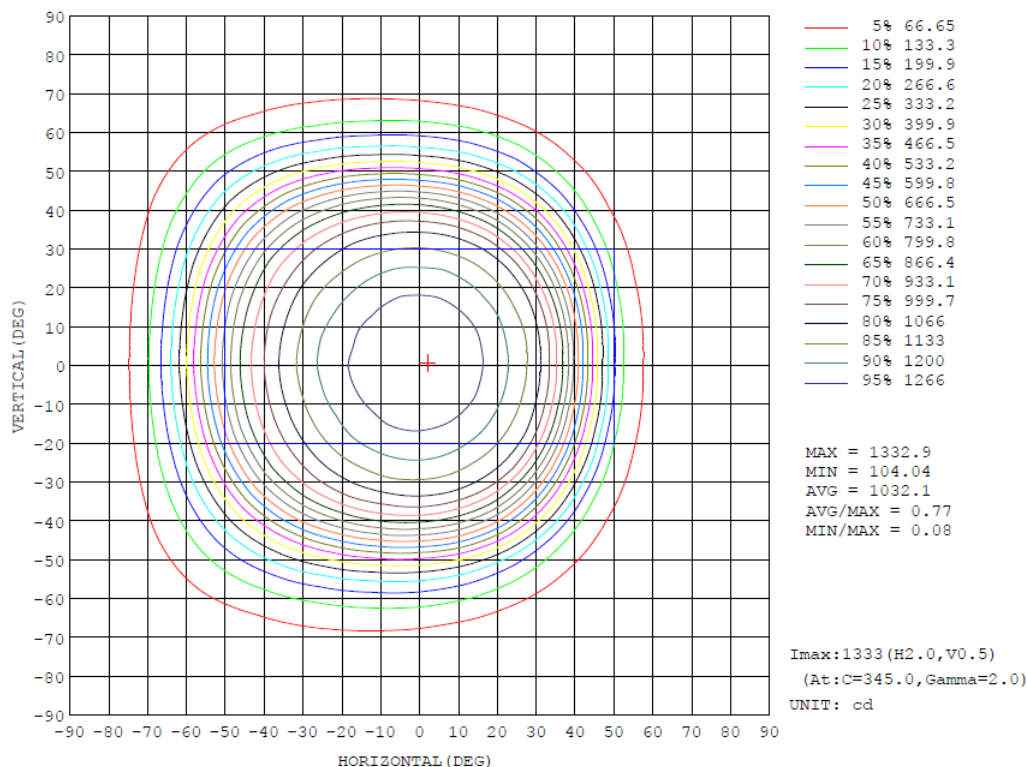
Zonal (lm)		Total (lm)		Percent
0-10	125.82	0-10	125.82	4.76%
10-20	361.79	0-20	487.61	18.44%
20-30	549.41	0-30	1037.02	39.21%
30-40	640.68	0-40	1677.70	63.43%
40-50	534.52	0-50	2212.22	83.64%
50-60	289.07	0-60	2501.29	94.57%
60-70	110.48	0-70	2611.77	98.75%
70-80	28.75	0-80	2640.52	99.84%
80-90	4.27	0-90	2644.79	100.00%
90-100	0.00	0-100	2644.79	100.00%
100-110	0.00	0-110	2644.79	100.00%
110-120	0.00	0-120	2644.79	100.00%
120-130	0.00	0-130	2644.79	100.00%
130-140	0.00	0-140	2644.79	100.00%
140-150	0.00	0-150	2644.79	100.00%
150-160	0.00	0-160	2644.79	100.00%
160-170	0.00	0-170	2644.79	100.00%
170-180	0.00	0-180	2644.79	100.00%

4.2 Goniophotometer Test

Area Flux Diagram

		AREA FLUX DIAGRAM																UNIT: lm				Φ t	Φ a
VERTICAL (DEG)	90	0.01	0.03	0.05	0.07	0.08	0.08	0.10	0.13	0.09	0.06	0.03	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.81	0.00		
	80	0.01	0.06	0.15	0.26	0.37	0.56	0.74	0.85	0.84	0.72	0.53	0.32	0.17	0.07	0.02	0.00	0.00	0.00	5.68	0.00		
	70	0.02	0.11	0.33	0.74	1.33	2.09	2.75	3.20	3.34	3.04	2.34	1.41	0.65	0.23	0.07	0.01	0.00	0.00	21.7	5.13		
	60	0.02	0.18	0.66	1.73	3.55	5.79	7.84	9.27	9.75	9.06	7.22	4.63	2.17	0.72	0.17	0.03	0.00	0.00	62.8	56.1		
	50	0.03	0.26	1.14	3.43	7.47	12.5	17.1	20.4	21.8	20.8	17.3	11.5	5.50	1.79	0.41	0.06	0.00	0.00	142	138		
	40	0.03	0.36	1.77	5.62	12.2	19.3	25.3	29.5	31.5	31.1	27.8	20.7	11.3	3.60	0.81	0.11	0.01	0.00	221	218		
	30	0.04	0.45	2.42	7.80	15.9	23.6	29.7	33.9	36.2	36.1	33.4	27.7	17.2	6.18	1.24	0.18	0.01	0.00	272	270		
	20	0.04	0.53	2.93	9.38	18.1	25.8	32.0	36.4	38.7	38.7	36.1	30.9	21.3	8.50	1.64	0.25	0.01	0.00	301	299		
	10	0.05	0.58	3.23	10.2	19.1	26.9	33.2	37.6	39.9	39.8	37.3	32.1	23.1	9.70	1.86	0.28	0.01	0.00	315	313		
	0	0.05	0.57	3.18	10.1	19.0	26.8	33.1	37.5	39.9	39.8	37.2	32.0	22.9	9.51	1.81	0.28	0.01	0.00	314	311		
	-10	0.04	0.52	2.81	9.03	17.9	25.6	31.8	36.2	38.5	38.4	35.8	30.6	20.8	7.97	1.54	0.24	0.01	0.00	298	296		
	-20	0.04	0.44	2.26	7.25	15.3	23.2	29.4	33.7	35.9	35.7	33.0	27.2	16.4	5.53	1.15	0.16	0.00	0.00	267	264		
	-30	0.03	0.35	1.64	5.04	11.1	18.3	24.5	28.8	30.9	30.6	27.2	19.9	10.2	3.04	0.75	0.09	0.00	0.00	212	209		
	-40	0.03	0.26	1.07	3.04	6.53	11.1	15.6	18.9	20.5	19.8	16.4	10.5	4.60	1.52	0.38	0.04	0.00	0.00	130	126		
	-50	0.02	0.17	0.63	1.60	3.14	5.09	6.99	8.40	8.97	8.32	6.41	3.88	1.80	0.62	0.15	0.02	0.00	0.00	56.2	48.5		
	-60	0.02	0.11	0.32	0.70	1.24	1.95	2.60	3.04	3.14	2.79	2.05	1.19	0.54	0.20	0.06	0.01	0.00	0.00	19.9	3.43		
	-70	0.01	0.07	0.15	0.25	0.36	0.53	0.71	0.81	0.79	0.66	0.47	0.28	0.14	0.06	0.02	0.00	0.00	0.00	5.31	0.00		
	-80	0.01	0.03	0.05	0.07	0.08	0.08	0.10	0.13	0.09	0.05	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.79	0.00		
	-90																						
		-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL (DEG)				20	30	40	50	60	70	80	90		
Φ t	0.50	5.09	24.8	76.3	153	229	293	339	361	356	320	255	159	59.3	12.1	1.78	0.06	0.00	0.00	2645	---		
Φ a	0.00	0.00	17.8	70.7	147	224	288	333	355	350	315	249	153	52.0	2.38	0.00	0.00	0.00	0.00	---	2557		

Isocandela



4.2 Goniophotometer Test

Luminous Distribution Intensity Data

Table--1

UNIT: cd

H (DEG)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
V (DEG)	-180	-170	-160	-150	-140	-130	-120	-110	-100	-90	-80	-70	-60	-50	-40	-30	-20	-10	0
-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-80	0.00	3.42	4.83	6.05	6.92	7.52	7.99	7.90	7.67	7.39	7.65	8.03	8.44	9.63	10.7	11.6	11.0	10.3	9.49
-70	0.00	5.02	7.79	10.7	13.5	16.5	20.0	23.6	26.9	29.9	35.1	41.1	46.2	49.8	52.1	53.1	52.5	50.5	47.2
-60	0.00	6.36	10.9	16.8	24.2	33.7	45.9	60.7	76.0	92.3	108	126	140	152	163	170	174	174	169
-50	0.00	7.67	14.5	24.7	40.2	62.0	89.5	125	165	210	257	304	349	386	420	443	457	465	456
-40	0.00	8.88	18.5	34.3	60.7	98.8	152	221	307	403	500	594	678	745	800	843	870	884	880
-30	0.00	9.94	22.2	44.6	83.5	142	229	344	480	622	751	855	938	1003	1050	1083	1108	1123	1124
-20	0.00	10.8	25.4	54.0	104	187	307	464	634	785	903	991	1062	1118	1166	1201	1224	1239	1245
-10	0.00	11.3	27.8	61.1	120	221	367	548	725	868	974	1059	1126	1184	1228	1260	1285	1302	1303
0	0.00	11.5	28.9	64.2	128	238	397	586	758	896	1000	1085	1157	1212	1255	1286	1310	1325	1330
10	0.00	11.3	27.9	61.6	122	228	379	562	735	874	982	1064	1134	1192	1232	1267	1291	1306	1309
20	0.00	10.7	25.6	54.9	107	198	328	493	661	804	915	1003	1073	1128	1170	1208	1233	1250	1251
30	0.00	9.86	22.5	45.6	86.2	152	253	379	523	664	785	882	958	1018	1064	1097	1120	1134	1137
40	0.00	8.77	18.7	35.1	63.4	106	167	249	351	456	557	654	732	794	845	881	906	917	913
50	0.00	7.55	14.4	25.2	42.0	64.9	95.9	137	189	242	297	350	398	437	471	493	504	508	495
60	0.00	6.26	10.7	17.0	24.9	35.1	48.3	63.9	81.7	101	120	138	153	164	177	182	186	186	181
70	0.00	4.97	7.49	10.4	13.3	16.9	21.3	24.8	28.5	31.7	37.4	43.7	48.7	52.2	54.7	55.8	55.5	53.8	50.8
80	0.00	3.42	4.72	5.70	6.47	7.06	7.45	7.56	7.35	6.86	7.22	7.62	8.09	9.39	10.6	11.5	11.2	10.9	10.5
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

UNIT: cd																			
H (DEG) V (DEG)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
-180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-80	7.73	5.76	3.71	3.12	2.79	2.82	2.18	1.60	1.08	0.68	0.37	0.16	0.10	0.06	0.05	0.06	0.05	0.00	
-70	42.6	37.2	31.2	25.0	19.1	14.2	10.5	7.26	4.76	2.97	1.59	0.71	0.33	0.13	0.05	0.05	0.06	0.00	
-60	158	144	124	101	79.0	57.1	38.1	23.7	14.6	8.82	4.74	2.26	0.92	0.29	0.09	0.05	0.05	0.00	
-50	439	406	354	290	222	160	110	72.2	44.1	24.7	12.0	5.31	1.88	0.50	0.15	0.06	0.05	0.00	
-40	861	823	762	675	556	418	276	160	92.4	53.6	29.2	12.1	3.42	0.85	0.24	0.07	0.05	0.00	
-30	1117	1097	1062	996	883	726	537	341	177	90.9	51.2	23.9	7.50	1.48	0.32	0.08	0.05	0.00	
-20	1233	1214	1181	1134	1076	955	764	531	303	135	71.0	36.8	12.2	2.23	0.39	0.08	0.05	0.00	
-10	1297	1282	1252	1207	1143	1060	898	662	403	189	85.8	45.9	16.8	2.88	0.42	0.07	0.05	0.00	
0	1323	1304	1276	1235	1170	1092	944	709	438	207	89.8	48.7	18.0	2.89	0.36	0.06	0.05	0.00	
10	1304	1289	1259	1215	1151	1072	916	681	421	202	89.7	46.6	17.4	3.23	0.53	0.09	0.05	0.00	
20	1246	1225	1194	1146	1087	974	789	564	332	154	74.2	37.8	13.3	2.87	0.57	0.12	0.05	0.00	
30	1127	1109	1077	1015	905	755	577	381	211	104	54.7	25.6	8.27	2.23	0.51	0.12	0.06	0.00	
40	893	851	788	704	592	462	320	195	110	59.8	31.3	13.5	4.75	1.46	0.40	0.11	0.06	0.00	
50	475	439	389	327	262	195	135	86.5	51.0	27.8	13.4	6.46	2.76	0.86	0.28	0.10	0.06	0.00	
60	173	160	142	118	93.8	68.2	45.7	28.4	17.4	10.1	5.87	3.09	1.39	0.51	0.18	0.08	0.06	0.00	
70	46.8	41.8	35.9	29.4	23.0	16.9	12.2	8.47	5.65	3.72	2.20	1.13	0.55	0.24	0.10	0.08	0.07	0.00	
80	8.38	6.12	3.91	3.60	3.44	3.50	2.74	2.07	1.46	0.97	0.57	0.28	0.18	0.12	0.09	0.08	0.06	0.00	
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	BULLET2X12 @24W4000K	Sample ID	241216022-S1
Temperature (°C)	25.4	Humidity (%RH)	41.0

Test Method
<p>The samples were tested according to the and Ansi C82.77: 2002 and ANSI C82.77-10:2020</p> <p>The total harmonic distortion shall be measured to the 40th order.</p> <p>The ambient temperature shall be maintained at 25±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 was calculated.</p>

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD(%)
120.0	60	0.204	24.3	0.991	13.64

5.0 Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2024-11-07	2025-11-06
NTC-F01-006	2.0 meter Integrating Sphere	2024-11-07	2025-11-06
NTC-F01-012	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-013	Standard Lamp	2024-10-28	2025-10-27
NTC-F01-031	Digital Power Meter	2024-08-06	2025-08-05
NTC-F01-019	Temperature & Humidity Meter	2024-10-29	2025-10-28

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