

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Address: 408 W 14th St New York, NY 10014

Prepared By

Dongguan New Testing Centre Co., Ltd.

Address: 3F No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China

Prepare by:

Alan Wang

Engineer: Alan Wang

Date: 2025-02-21

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

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		1978
Minimum Luminaire Efficacy (lm/W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Standard	Premium	106.9
		105	120	
Power (Input Wattage) (W) (Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		18.5
Total Harmonic Distortion (A%) (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	20.00%	120V	14.40
Power Factor (THD & PF – Section 4.3)	ANSI C82.77:2002 ANSI C82-77-10:2020	0.9	120V	0.989
Allowable CCTs* (K) (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019	7 steps	3045±175	3081
		4 steps	3045±100	
Minimum CRI (Integrating Sphere – Section 4.1)	ANSI/IES LM-79:2019 CIE13.3-1995	≥70		82.6
Minimum R9 (Integrating Sphere – Section 4.1)	ANSI/IES LM-79-2019 CIE13.3-1995	N/A		7
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		0.156
(Goniophotometer – Section 4.2)		Non-Worst Case		N/A
Power (Input Wattage – W)				
(Goniophotometer – Section 4.2)	ANSI/IES LM-79:2019	Worst Case		18.5
(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 @18W3000K	ES 1st ES #3-3	241216022-S1
2	Goniophotometer Test	2025-02-20	BULLET2X12 @18W3000K	ES 1st ES #3-3	241216022-S1
3	THD and PF Test	2025-02-20	BULLET2X12 @18W3000K	ES 1st ES #3-3	241216022-S1

Remark (If any):

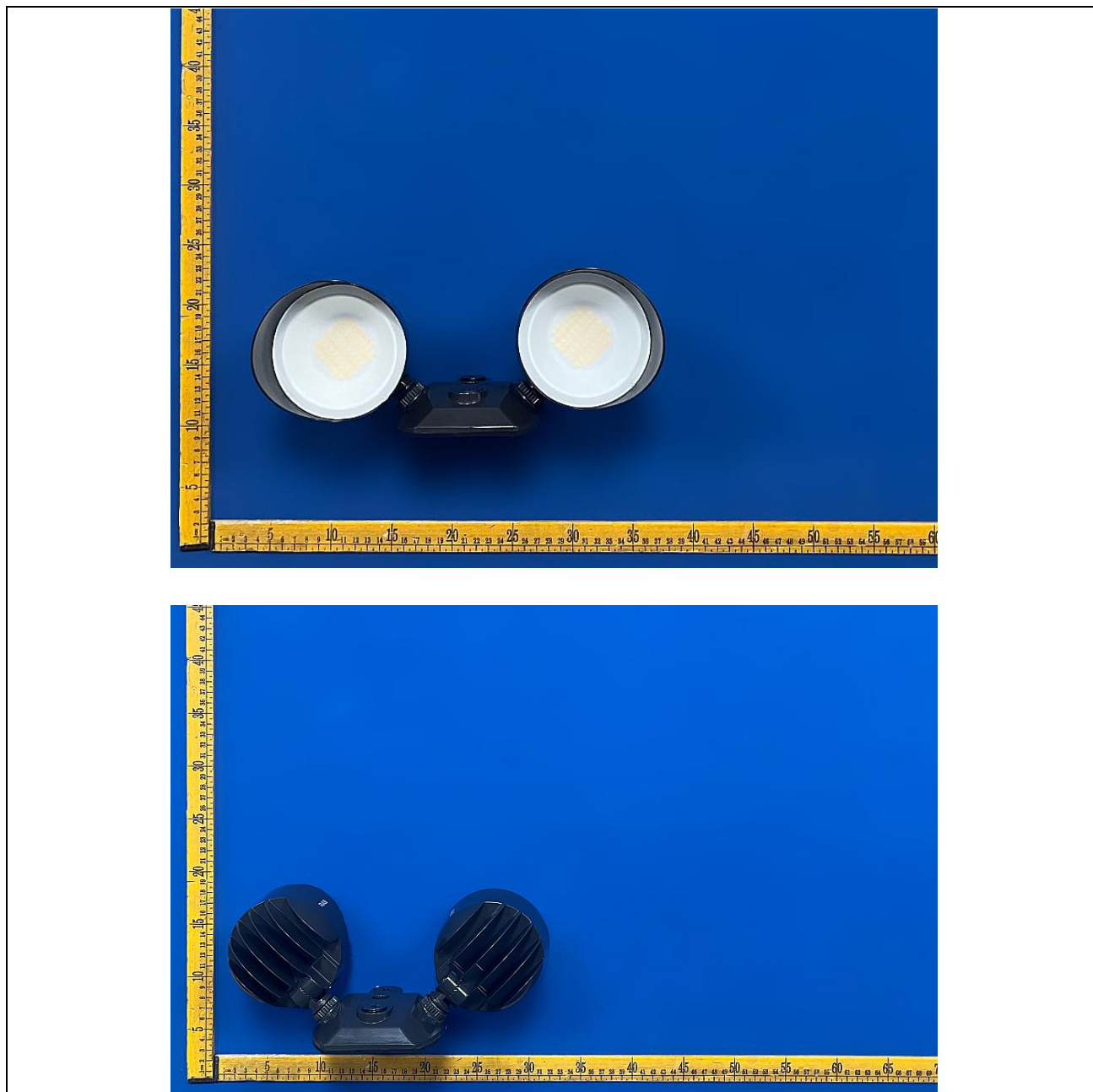
1. The results contained in this report pertain only to the tested samples.
2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd.
3. This report must not be used by the client to claim product certification, approval, or endorsement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

3.0 Product Description

Luminaire Description: Model No. BULLET2X12 @18W3000K, 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 @18W3000K	Sample ID	241216022-S1
Operate time (Min.)	10	Stabilization time (Min.)	60
Temperature (°C)	25.4	Humidity (%RH)	41.0

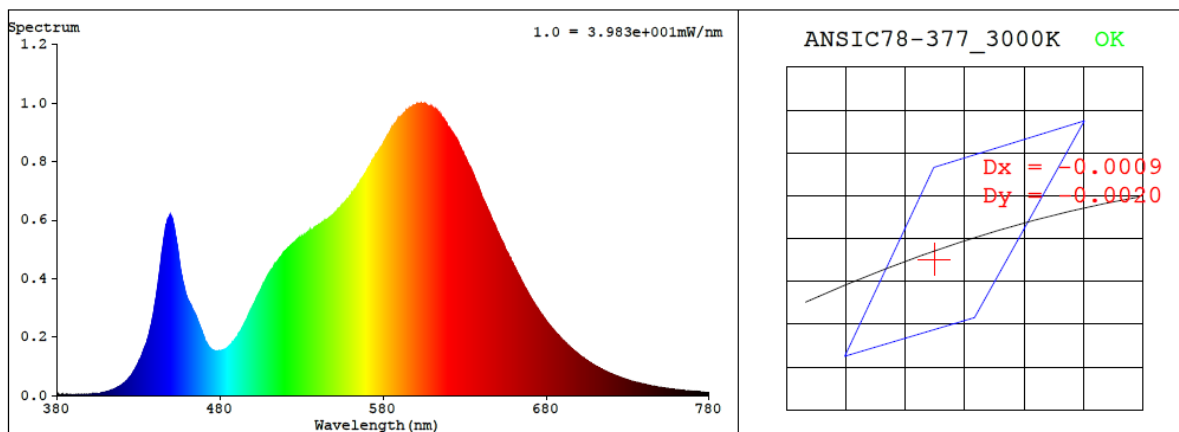
Test Method
<p>The Samples were tested according to the ANSI/IES LM-79:2019.</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25±1°C.</p> <p>The sample measurements were made 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	0.156	18.5	0.989

CCT (K)	CRI	R9	Duv	SDCM	Rf	Rg	IES Rcs,h1
3081	82.6	7	-0.0007	1.8	84	98	-11%

4.1 Integrating Sphere Test



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4304$ $y = 0.4001$ / $u' = 0.2481$ $v' = 0.5188$ ($duv = -6.62e-04$)

CCT= 3081K Prcp WL: Ld=582.7nm Purity=49.3%

Peak WL: Lp=603nm FWHM: =134.7nm Ratio:R=22.5% G=75.2% B=2.3%

Render Index: Ra = 82.6 AvgR = 76.6 TM30:Rf=83 Rg=97

EEL: 0.12728 A+

R1 =81 R2 =90 R3 =96 R4 =82 R5 =81 R6 =87 R7 =84

R8 =60 R9 =7 R10=76 R11=82 R12=69 R13=83 R14=98 R15=74

4.1 Integrating Sphere Test

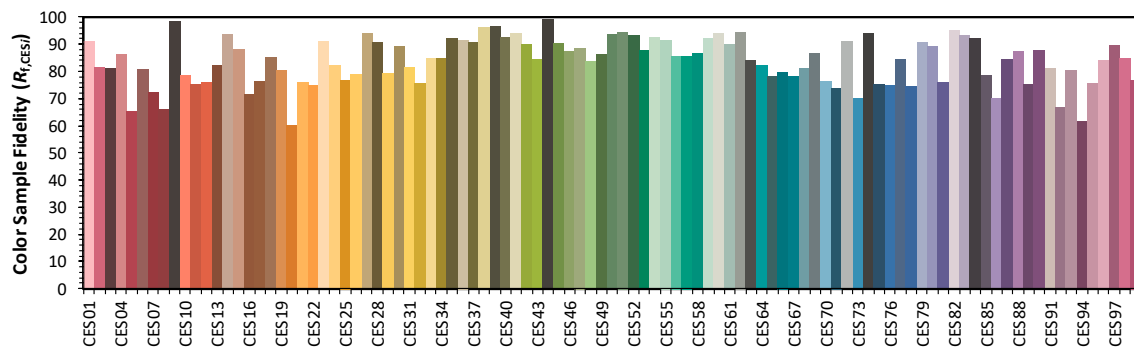
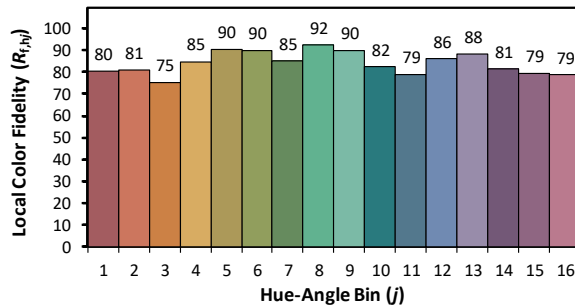
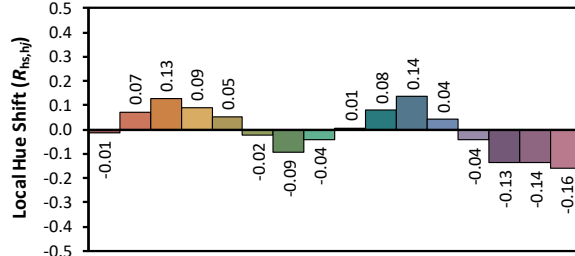
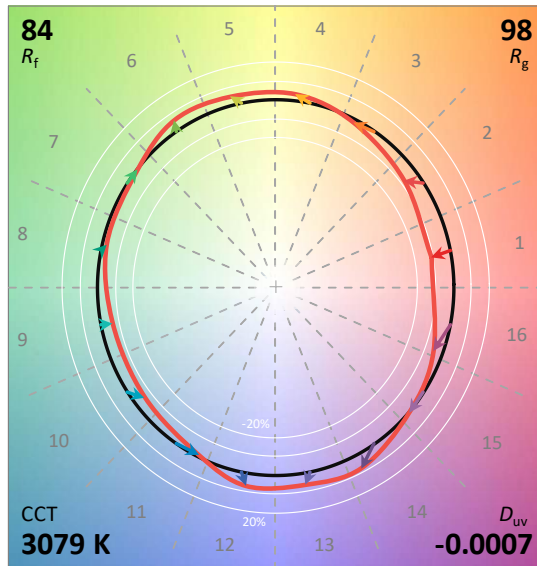
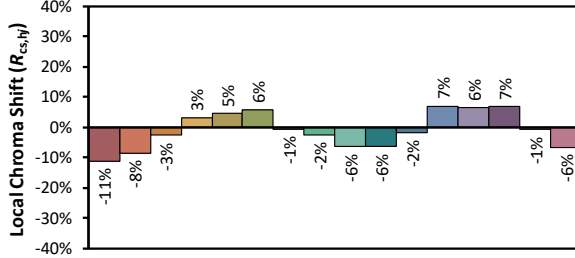
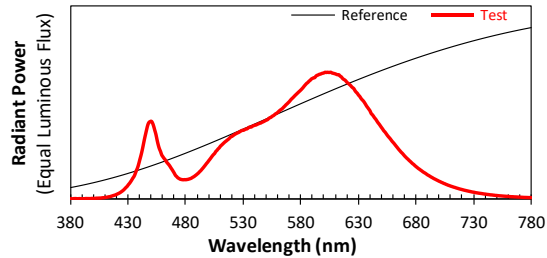
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: RAB Lighting Inc.

Date: 2025/2/21

Model: BULLET2X12 @18W3000K



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

x 0.4304
 y 0.4000
 u' 0.2481
 v' 0.5188

CIE 13.3-1995
(CRI)

R_a 83
 R_g 7

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	4.20E-06	447	5.85E-04	514	4.50E-04	581	8.69E-04	648	5.89E-04	715	8.72E-05
381	1.00E-06	448	6.03E-04	515	4.57E-04	582	8.79E-04	649	5.76E-04	716	8.47E-05
382	2.90E-06	449	6.09E-04	516	4.64E-04	583	8.91E-04	650	5.63E-04	717	8.19E-05
383	3.40E-06	450	6.12E-04	517	4.71E-04	584	9.01E-04	651	5.51E-04	718	7.91E-05
384	3.90E-06	451	5.99E-04	518	4.80E-04	585	9.10E-04	652	5.37E-04	719	7.68E-05
385	3.10E-06	452	5.73E-04	519	4.89E-04	586	9.17E-04	653	5.27E-04	720	7.45E-05
386	2.50E-06	453	5.40E-04	520	4.93E-04	587	9.27E-04	654	5.15E-04	721	7.21E-05
387	3.30E-06	454	5.08E-04	521	4.99E-04	588	9.34E-04	655	5.02E-04	722	6.95E-05
388	3.40E-06	455	4.64E-04	522	5.06E-04	589	9.44E-04	656	4.90E-04	723	6.75E-05
389	2.60E-06	456	4.26E-04	523	5.12E-04	590	9.49E-04	657	4.81E-04	724	6.54E-05
390	2.40E-06	457	3.96E-04	524	5.16E-04	591	9.54E-04	658	4.69E-04	725	6.34E-05
391	2.60E-06	458	3.74E-04	525	5.21E-04	592	9.55E-04	659	4.57E-04	726	6.12E-05
392	2.90E-06	459	3.47E-04	526	5.25E-04	593	9.67E-04	660	4.46E-04	727	5.94E-05
393	4.10E-06	460	3.34E-04	527	5.31E-04	594	9.73E-04	661	4.36E-04	728	5.73E-05
394	4.00E-06	461	3.20E-04	528	5.36E-04	595	9.76E-04	662	4.24E-04	729	5.52E-05
395	3.70E-06	462	3.10E-04	529	5.41E-04	596	9.81E-04	663	4.13E-04	730	5.40E-05
396	3.80E-06	463	2.95E-04	530	5.41E-04	597	9.83E-04	664	4.02E-04	731	5.20E-05
397	3.60E-06	464	2.83E-04	531	5.45E-04	598	9.88E-04	665	3.90E-04	732	4.99E-05
398	4.60E-06	465	2.73E-04	532	5.51E-04	599	9.90E-04	666	3.80E-04	733	4.87E-05
399	4.90E-06	466	2.60E-04	533	5.52E-04	600	9.93E-04	667	3.69E-04	734	4.70E-05
400	4.40E-06	467	2.46E-04	534	5.58E-04	601	9.97E-04	668	3.61E-04	735	4.57E-05
401	5.20E-06	468	2.32E-04	535	5.65E-04	602	9.96E-04	669	3.51E-04	736	4.46E-05
402	6.70E-06	469	2.18E-04	536	5.66E-04	603	9.97E-04	670	3.40E-04	737	4.32E-05
403	6.80E-06	470	2.02E-04	537	5.67E-04	604	9.96E-04	671	3.30E-04	738	4.17E-05
404	7.20E-06	471	1.86E-04	538	5.74E-04	605	9.96E-04	672	3.21E-04	739	4.01E-05
405	7.70E-06	472	1.77E-04	539	5.78E-04	606	9.98E-04	673	3.13E-04	740	3.91E-05
406	7.90E-06	473	1.67E-04	540	5.81E-04	607	9.92E-04	674	3.04E-04	741	3.77E-05
407	9.20E-06	474	1.62E-04	541	5.83E-04	608	9.90E-04	675	2.96E-04	742	3.63E-05
408	1.04E-05	475	1.57E-04	542	5.88E-04	609	9.87E-04	676	2.87E-04	743	3.53E-05
409	1.05E-05	476	1.54E-04	543	5.92E-04	610	9.85E-04	677	2.79E-04	744	3.40E-05
410	1.27E-05	477	1.52E-04	544	5.96E-04	611	9.80E-04	678	2.72E-04	745	3.28E-05
411	1.39E-05	478	1.52E-04	545	5.98E-04	612	9.78E-04	679	2.63E-04	746	3.23E-05
412	1.55E-05	479	1.53E-04	546	6.03E-04	613	9.78E-04	680	2.55E-04	747	3.09E-05
413	1.77E-05	480	1.52E-04	547	6.07E-04	614	9.67E-04	681	2.48E-04	748	3.00E-05
414	1.87E-05	481	1.54E-04	548	6.12E-04	615	9.62E-04	682	2.41E-04	749	2.86E-05
415	2.18E-05	482	1.55E-04	549	6.17E-04	616	9.51E-04	683	2.35E-04	750	2.81E-05
416	2.45E-05	483	1.58E-04	550	6.21E-04	617	9.42E-04	684	2.28E-04	751	2.70E-05
417	2.77E-05	484	1.61E-04	551	6.25E-04	618	9.37E-04	685	2.21E-04	752	2.60E-05
418	3.00E-05	485	1.65E-04	552	6.34E-04	619	9.29E-04	686	2.14E-04	753	2.52E-05
419	3.36E-05	486	1.72E-04	553	6.40E-04	620	9.18E-04	687	2.09E-04	754	2.47E-05
420	3.76E-05	487	1.76E-04	554	6.43E-04	621	9.11E-04	688	2.03E-04	755	2.38E-05
421	4.20E-05	488	1.83E-04	555	6.52E-04	622	9.02E-04	689	1.97E-04	756	2.32E-05
422	4.63E-05	489	1.90E-04	556	6.56E-04	623	8.95E-04	690	1.90E-04	757	2.24E-05
423	5.17E-05	490	1.98E-04	557	6.63E-04	624	8.84E-04	691	1.85E-04	758	2.19E-05
424	5.80E-05	491	2.06E-04	558	6.71E-04	625	8.76E-04	692	1.80E-04	759	2.10E-05
425	6.47E-05	492	2.16E-04	559	6.75E-04	626	8.68E-04	693	1.74E-04	760	2.05E-05
426	7.23E-05	493	2.24E-04	560	6.84E-04	627	8.52E-04	694	1.69E-04	761	1.97E-05
427	8.18E-05	494	2.35E-04	561	6.92E-04	628	8.41E-04	695	1.64E-04	762	1.89E-05
428	9.15E-05	495	2.45E-04	562	7.00E-04	629	8.32E-04	696	1.59E-04	763	1.83E-05
429	1.00E-04	496	2.57E-04	563	7.06E-04	630	8.18E-04	697	1.54E-04	764	1.82E-05
430	1.13E-04	497	2.68E-04	564	7.13E-04	631	8.09E-04	698	1.49E-04	765	1.74E-05
431	1.23E-04	498	2.80E-04	565	7.23E-04	632	7.94E-04	699	1.45E-04	766	1.69E-05
432	1.36E-04	499	2.91E-04	566	7.32E-04	633	7.83E-04	700	1.40E-04	767	1.66E-05
433	1.50E-04	500	3.03E-04	567	7.42E-04	634	7.74E-04	701	1.37E-04	768	1.59E-05
434	1.66E-04	501	3.15E-04	568	7.50E-04	635	7.62E-04	702	1.32E-04	769	1.55E-05
435	1.79E-04	502	3.27E-04	569	7.59E-04	636	7.47E-04	703	1.28E-04	770	1.48E-05
436	2.00E-04	503	3.39E-04	570	7.68E-04	637	7.32E-04	704	1.24E-04	771	1.44E-05
437	2.24E-04	504	3.50E-04	571	7.79E-04	638	7.20E-04	705	1.20E-04	772	1.39E-05
438	2.45E-04	505	3.59E-04	572	7.89E-04	639	7.07E-04	706	1.16E-04	773	1.34E-05
439	2.76E-04	506	3.74E-04	573	7.97E-04	640	6.94E-04	707	1.13E-04	774	1.28E-05
440	3.10E-04	507	3.83E-04	574	8.07E-04	641	6.73E-04	708	1.09E-04	775	1.27E-05
441	3.44E-04	508	3.95E-04	575	8.16E-04	642	6.64E-04	709	1.06E-04	776	1.24E-05
442	3.82E-04	509	4.03E-04	576	8.25E-04	643	6.52E-04	710	1.02E-04	777	1.20E-05
443	4.25E-04	510	4.16E-04	577	8.33E-04	644	6.38E-04	711	9.91E-05	778	1.16E-05
444	4.71E-04	511	4.24E-04	578	8.42E-04	645	6.28E-04	712	9.61E-05	779	1.16E-05
445	5.11E-04	512	4.33E-04	579	8.50E-04	646	6.14E-04	713	9.30E-05	780	1.16E-05
446	5.50E-04	513	4.41E-04	580	8.59E-04	647	6.00E-04	714	9.07E-05	N/A	N/A

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	BULLET2X12 @18W3000K	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

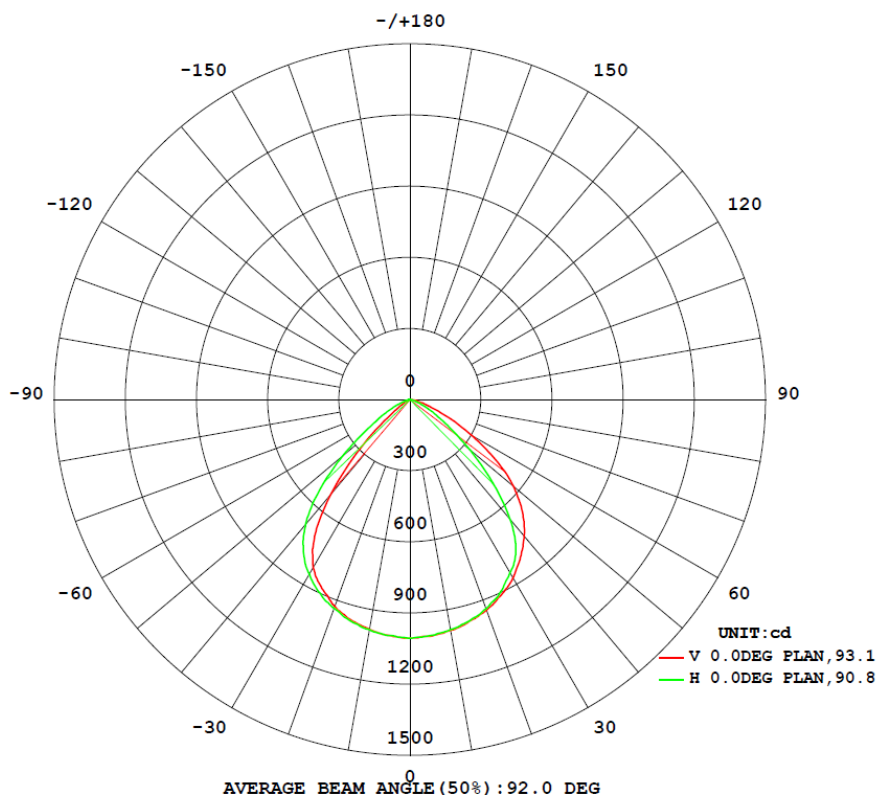
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.0	60	0.156	18.5	0.989
NON-WORST CASE	N/A	N/A	N/A	N/A	N/A

Test Result

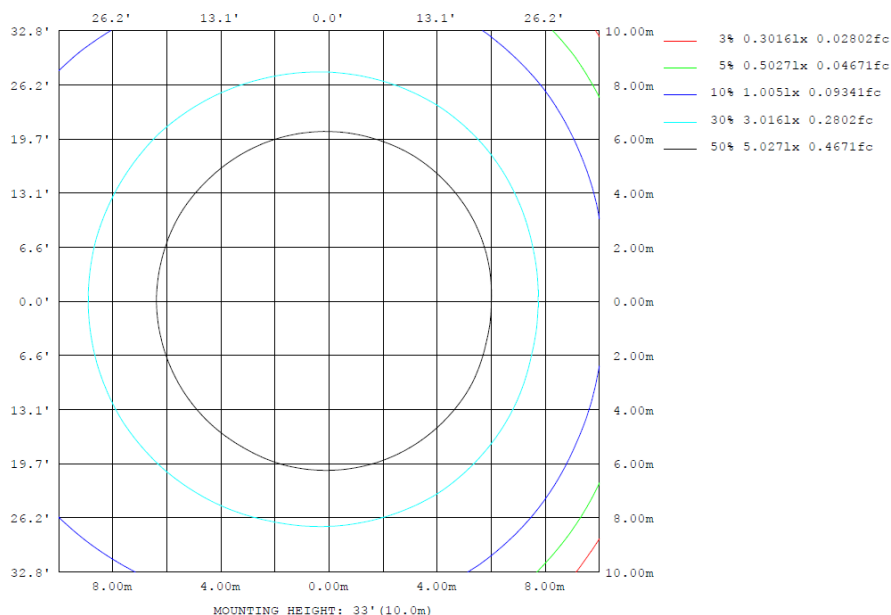
Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)	Zonal Lumen Requirement (0°-90°)	NEMA Type
	C0-180	C90-270	C0-180	C90-270			
1978	124.5	126.1	92.8	90.7	106.9	100.0%	6H x 6V

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	983.9	983.3	984.6	988.3	987.8	986.4	985.5	984.5	0- 10	94.88	94.88	4.8,4.8
20	927.7	928.0	938.2	936.4	944.4	939.6	937.2	932.1	10- 20	272.5	367.3	18.6,18.6
30	817.6	830.6	844.4	853.9	869.3	856.9	849.9	836.4	20- 30	412.7	780.0	39.4,39.4
40	518.0	588.4	655.9	725.7	750.4	740.0	684.8	613.0	30- 40	479.1	1259	63.6,63.6
50	148.2	238.9	331.9	466.3	570.2	521.2	373.1	276.9	40- 50	396.7	1656	83.7,83.7
60	34.94	56.15	122.7	194.5	300.2	232.0	136.2	73.55	50- 60	214.7	1870	94.6,94.6
70	1.983	10.09	34.31	59.36	97.93	64.72	38.31	12.07	60- 70	82.64	1953	98.7,98.7
80	0.0421	1.600	6.297	10.29	22.84	10.15	7.836	1.997	70- 80	21.78	1975	99.8,99.8
90	0	0	0	0	0	0	0	0	80- 90	3.278	1978	100,100
100	0	0	0	0	0	0	0	0	90-100	0	1978	100,100
110	0	0	0	0	0	0	0	0	100-110	0	1978	100,100
120	0	0	0	0	0	0	0	0	110-120	0	1978	100,100
130	0	0	0	0	0	0	0	0	120-130	0	1978	100,100
140	0	0	0	0	0	0	0	0	130-140	0	1978	100,100
150	0	0	0	0	0	0	0	0	140-150	0	1978	100,100
160	0	0	0	0	0	0	0	0	150-160	0	1978	100,100
170	0	0	0	0	0	0	0	0	160-170	0	1978	100,100
180	0	0	0	0	0	0	0	0	170-180	0	1978	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

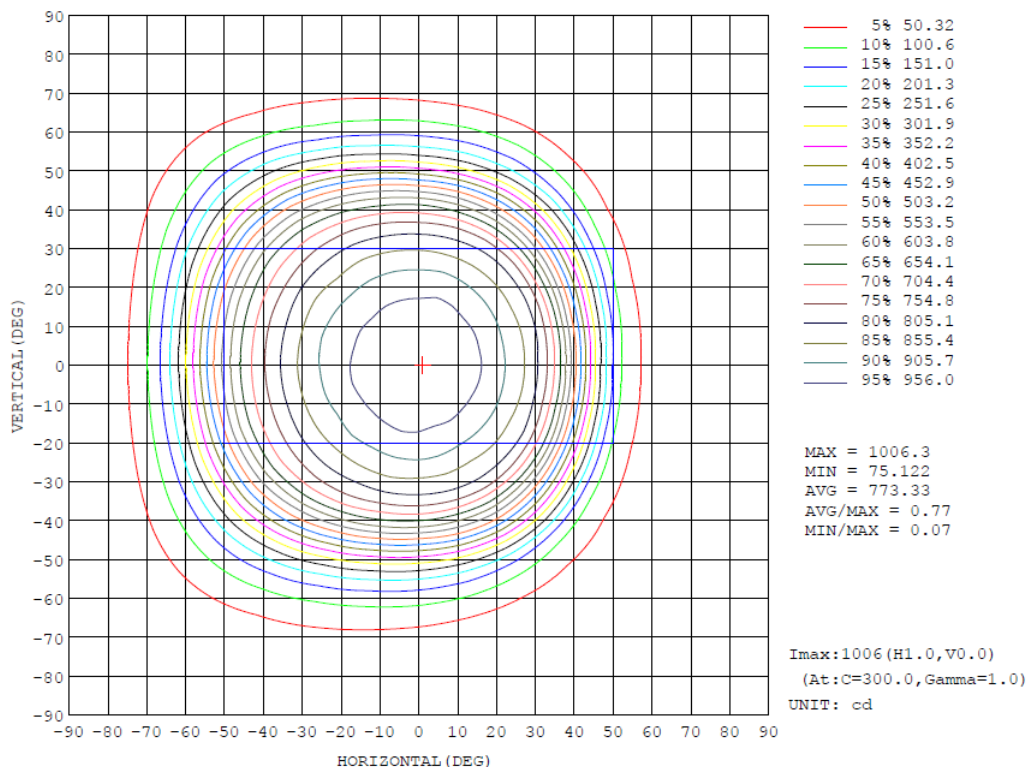
Zonal (lm)		Total (lm)		Percent
0-10	94.88	0-10	94.88	4.80%
10-20	272.46	0-20	367.34	18.57%
20-30	412.68	0-30	780.02	39.43%
30-40	479.06	0-40	1259.08	63.65%
40-50	396.66	0-50	1655.74	83.70%
50-60	214.74	0-60	1870.48	94.56%
60-70	82.64	0-70	1953.12	98.73%
70-80	21.78	0-80	1974.90	99.83%
80-90	3.28	0-90	1978.18	100.00%
90-100	0.00	0-100	1978.18	100.00%
100-110	0.00	0-110	1978.18	100.00%
110-120	0.00	0-120	1978.18	100.00%
120-130	0.00	0-130	1978.18	100.00%
130-140	0.00	0-140	1978.18	100.00%
140-150	0.00	0-150	1978.18	100.00%
150-160	0.00	0-160	1978.18	100.00%
160-170	0.00	0-170	1978.18	100.00%
170-180	0.00	0-180	1978.18	100.00%

4.2 Goniophotometer Test

Area Flux Diagram

		AREA FLUX DIAGRAM																	UNIT: lm			Φ t	Φ a
VERTICAL (DEG)	90	0.00	0.02	0.04	0.05	0.06	0.06	0.08	0.09	0.07	0.04	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.61	0.00			
	80	0.01	0.05	0.11	0.19	0.28	0.42	0.56	0.64	0.63	0.55	0.40	0.24	0.12	0.05	0.02	0.00	0.00	4.28	0.00			
	70	0.01	0.09	0.26	0.57	1.02	1.59	2.07	2.41	2.51	2.28	1.75	1.06	0.48	0.17	0.05	0.01	0.00	16.3	3.8			
	60	0.02	0.14	0.51	1.34	2.71	4.42	5.96	7.03	7.36	6.79	5.37	3.42	1.61	0.52	0.12	0.02	0.00	47.4	42.3			
	50	0.02	0.20	0.88	2.62	5.68	9.48	13.0	15.4	16.4	15.7	12.9	8.53	4.04	1.31	0.29	0.04	0.00	107	104			
	40	0.03	0.28	1.35	4.27	9.19	14.6	19.0	22.1	23.6	23.3	20.8	15.4	8.24	2.61	0.58	0.07	0.00	165	163			
	30	0.03	0.35	1.84	5.90	12.0	17.7	22.3	25.5	27.2	27.0	25.0	20.6	12.5	4.45	0.89	0.12	0.00	203	202			
	20	0.03	0.41	2.22	7.08	13.6	19.4	24.1	27.3	29.1	29.1	27.1	23.1	15.7	6.11	1.18	0.17	0.01	226	224			
	10	0.04	0.44	2.44	7.67	14.3	20.1	24.9	28.3	30.1	30.0	28.1	24.1	17.1	7.02	1.34	0.20	0.01	236	235			
	0	0.04	0.44	2.41	7.58	14.3	20.1	24.9	28.3	30.1	30.0	28.0	24.0	17.0	6.91	1.30	0.20	0.00	235	234			
	-10	0.03	0.40	2.14	6.81	13.4	19.2	23.9	27.3	29.1	29.0	26.9	23.0	15.4	5.76	1.10	0.17	0.00	224	222			
	-20	0.03	0.34	1.72	5.48	11.4	17.4	22.1	25.3	27.0	26.9	24.8	20.3	12.0	3.93	0.82	0.12	0.00	200	198			
	-30	0.03	0.27	1.26	3.82	8.34	13.6	18.3	21.6	23.2	22.9	20.2	14.6	7.35	2.12	0.53	0.06	0.00	158	156			
	-40	0.02	0.20	0.83	2.30	4.90	8.22	11.5	13.9	15.1	14.4	11.8	7.49	3.22	1.06	0.27	0.03	0.00	95.3	91.9			
	-50	0.02	0.14	0.48	1.22	2.37	3.79	5.16	6.17	6.54	6.01	4.59	2.73	1.25	0.43	0.11	0.01	0.00	41.0	35.1			
	-60	0.01	0.09	0.25	0.54	0.95	1.48	1.94	2.24	2.29	2.01	1.45	0.83	0.38	0.14	0.04	0.01	0.00	14.6	2.10			
	-70	0.01	0.05	0.12	0.20	0.28	0.41	0.55	0.61	0.58	0.48	0.33	0.19	0.10	0.04	0.01	0.00	0.00	3.96	0.00			
	-80	0.00	0.02	0.04	0.06	0.06	0.06	0.08	0.10	0.07	0.04	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.61	0.00			
	-90	0.00	0.02	0.04	0.05	0.06	0.06	0.08	0.09	0.07	0.04	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.61	0.00			
			-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90		
Φ t	0.39	3.93	18.9	57.7	115	172	220	254	271	267	240	190	116	42.7	8.64	1.24	0.04	0.00	1978	---			
Φ a	0.00	0.00	13.7	53.5	111	168	216	250	267	262	235	185	112	37.0	1.43	0.00	0.00	0.00	---	1912			

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)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
-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	2.79	3.94	4.85	5.50	5.97	6.19	6.25	5.94	5.42	5.81	6.10	6.42	7.41	8.21	8.78	8.06	7.23	6.30
-70	0.00	4.05	6.17	8.57	10.7	12.9	15.5	18.2	20.8	23.3	27.3	31.7	35.4	37.8	39.0	39.4	38.7	37.0	34.3
-60	0.00	5.06	8.62	13.1	18.8	26.1	35.2	45.7	58.0	70.5	82.3	94.4	105	113	121	125	127	127	123
-50	0.00	6.06	11.3	19.3	31.2	47.2	69.2	94.5	125	158	192	226	257	284	308	325	334	338	332
-40	0.00	6.99	14.2	26.6	46.7	77.0	116	168	232	303	374	442	502	553	595	627	648	658	656
-30	0.00	7.80	17.3	34.4	63.8	109	175	261	362	465	561	639	703	753	787	812	835	845	844
-20	0.00	8.43	20.1	41.6	80.3	142	233	351	476	590	679	745	798	841	877	903	923	937	938
-10	0.00	8.82	22.0	46.9	92.2	168	278	412	545	652	731	795	847	889	924	949	969	986	995
0	0.00	8.98	22.8	49.3	97.9	180	300	441	570	671	750	813	869	910	944	968	988	1001	1005
10	0.00	8.79	22.1	47.3	93.6	172	287	423	553	655	737	797	851	896	926	951	972	982	986
20	0.00	8.36	20.3	42.3	82.1	149	248	372	498	604	686	751	806	848	879	907	927	937	937
30	0.00	7.71	17.4	35.2	66.2	117	193	287	394	501	592	664	719	762	798	822	841	850	850
40	0.00	6.88	14.1	27.2	48.9	81.2	127	190	266	344	421	495	554	601	637	661	680	688	685
50	0.00	5.95	11.2	20.0	32.6	50.2	74.0	106	144	185	228	268	303	334	359	375	383	385	373
60	0.00	4.96	8.31	13.0	19.6	27.5	37.4	49.5	63.0	77.2	91.2	105	116	124	133	137	140	140	136
70	0.00	3.96	5.89	8.09	10.4	12.9	15.7	19.2	22.0	24.9	28.4	32.9	36.6	39.2	41.0	41.9	41.8	40.5	38.3
80	0.00	2.73	3.75	4.50	5.07	5.51	5.78	5.85	5.67	5.26	5.50	5.75	6.02	7.01	7.96	8.68	8.46	8.21	7.84
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)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
V (DEG)																			
-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	5.14	3.86	2.54	2.21	2.02	2.02	1.56	1.14	0.77	0.48	0.26	0.12	0.07	0.05	0.04	0.04	0.04	0.00	
-70	30.7	26.5	21.9	17.5	13.3	9.87	7.38	5.16	3.38	2.11	1.12	0.50	0.23	0.09	0.04	0.04	0.04	0.00	
-60	114	103	88.2	71.3	54.4	39.3	26.6	16.7	10.4	6.21	3.33	1.59	0.64	0.20	0.06	0.04	0.04	0.00	
-50	317	291	254	208	158	112	77.2	50.0	31.1	17.4	8.50	3.59	1.31	0.35	0.11	0.04	0.04	0.00	
-40	639	607	558	493	401	300	195	110	64.5	38.2	20.6	8.62	2.35	0.59	0.17	0.05	0.04	0.00	
-30	839	823	798	745	653	531	389	242	123	64.4	36.5	16.8	5.01	1.02	0.22	0.06	0.04	0.00	
-20	927	912	887	852	807	711	562	386	216	95.1	50.1	26.1	8.75	1.54	0.27	0.06	0.04	0.00	
-10	978	965	943	907	860	791	665	485	292	135	62.3	32.8	11.7	1.98	0.29	0.05	0.04	0.00	
0	998	984	963	928	879	818	701	518	319	148	67.1	34.9	12.7	1.98	0.25	0.04	0.04	0.00	
10	982	967	946	910	863	802	677	493	303	144	64.4	33.2	11.9	2.21	0.36	0.07	0.04	0.00	
20	938	918	895	858	812	723	577	407	239	110	52.8	26.6	9.08	1.98	0.39	0.08	0.04	0.00	
30	843	827	805	757	672	557	421	276	150	75.1	38.8	17.8	5.64	1.53	0.35	0.09	0.04	0.00	
40	669	639	590	525	438	339	233	141	80.4	42.7	22.5	9.27	3.30	1.00	0.27	0.08	0.04	0.00	
50	356	328	289	242	192	143	100	64.0	37.0	19.7	9.48	4.56	1.91	0.59	0.19	0.07	0.05	0.00	
60	130	120	106	88.3	70.1	51.0	33.9	21.1	12.2	7.32	4.16	2.16	0.96	0.35	0.12	0.06	0.05	0.00	
70	35.3	31.6	27.2	22.3	17.2	12.7	9.15	6.22	4.08	2.65	1.54	0.77	0.37	0.16	0.07	0.06	0.05	0.00	
80	6.15	4.36	2.63	2.50	2.47	2.57	2.00	1.49	1.03	0.68	0.39	0.19	0.12	0.09	0.07	0.06	0.05	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 @18W3000K	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 $25 \pm 1^\circ\text{C}$. 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	0.156	18.5	0.989	14.40

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*****