

LM-79-08 Test Report

For

ASmart LIGHT CO., LTD

(Brand Name: ASmart)

506 N GARFIELD AVE SUITE#210 ALHAMBRA CA 91801

Architectural Flood and Spot Luminaires

Model name(s): AST-LJ01-21WBMUDA1-a

Remark: "a" can be any two letters to represent color of luminaire.

Representative (Tested) Model:

AST-LJ01-21WBMUDA1-a (Setting at 3000K)

AST-LJ01-21WBMUDA1-a (Setting at 4000K)

AST-LJ01-21WBMUDA1-a (Setting at 5000K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Sophie Yang

Engineer: Sophie Yang

Date: 2022-02-15

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	ASmart LIGHT CO., LTD	
Brand Name	ASmart	
Model Number	AST-LJ01-21WBMUDA1-a	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	21W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K, 4000K, 5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	BLC2201019E-A1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	2022-01-20
Date of Test	2022-01-26
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	BL-QP-033

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the 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 sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Goniophotometer far field detector $f1'=1.42\%$, Test distance: 14.14m

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity 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 sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

Self-absorption:

AST-LJ01-21WBMUDA1-a Setting at 3000K:1.0360

AST-LJ01-21WBMUDA1-a Setting at 4000K:1.0360

AST-LJ01-21WBMUDA1-a Setting at 5000K:1.0360

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-01-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-LJ01-21WBMUDA1-a (Setting at 3000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220101	120.0	60	0.180	21.21	0.98	18.15
9E-A1	277.0	60	0.084	21.17	0.914	13.81
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

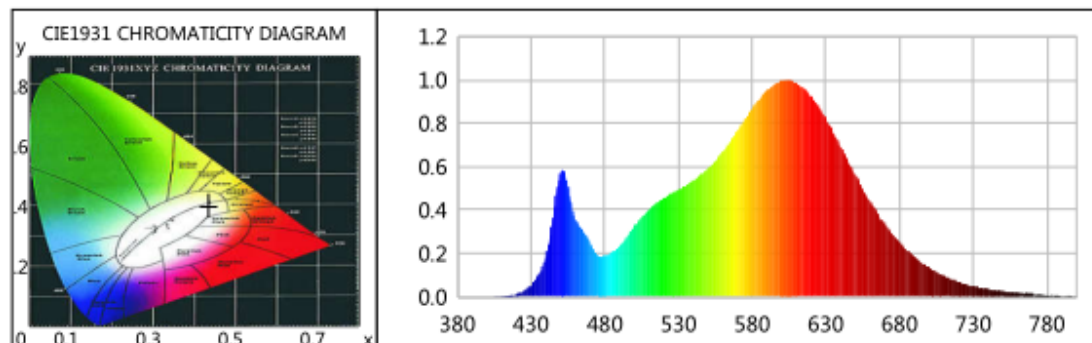
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	5
Frequency (Hz)	60	R2	91	R10	81
CCT (K)	2994	R3	96	R11	80
Duv	-0.0005	R4	80	R12	72
Chromaticity (x, y)	x=0.4367 y=0.4028	R5	82	R13	83
Chromaticity (u', v')	u(u')=0.2510 v'=0.5209	R6	90	R14	98
Color Rendering Index (CRI)	82	R7	81	R15	73
R9	5	R8	57	--	--
Rf	85	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-12				

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2471.1	2439.0	>=1000(-10%)
Luminous Efficacy (lm/W)	116.51	115.21	Standard: >= 105(-3%)
Most worst Luminous/Highest	114.99		
Zonal lumens in the 0-90 °zone (%)	82.9	--	>=85(-3)
Beam Angle (°)	163.8	--	--
Center Beam Candle Power (cd)	357	--	--

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0088	535	0.4759	22.5912	690	0.3326	15.7891
385	0.0002	0.0099	540	0.4932	23.4133	695	0.2896	13.7471
390	0.0006	0.0284	545	0.5130	24.3524	700	0.2500	11.8687
395	0.0003	0.0142	550	0.5356	25.4266	705	0.2140	10.1591
400	0.0007	0.0342	555	0.5617	26.6652	710	0.1847	8.7662
405	0.0015	0.0705	560	0.5914	28.0778	715	0.1565	7.4272
410	0.0027	0.1265	565	0.6257	29.7060	720	0.1334	6.3310
415	0.0066	0.3132	570	0.6692	31.7684	725	0.1145	5.4355
420	0.0143	0.6767	575	0.7148	33.9316	730	0.0975	4.6278
425	0.0280	1.3275	580	0.7632	36.2314	735	0.0821	3.8961
430	0.0533	2.5299	585	0.8147	38.6746	740	0.0683	3.2445
435	0.0984	4.6707	590	0.8663	41.1273	745	0.0587	2.7882
440	0.1855	8.8062	595	0.9110	43.2482	750	0.0500	2.3749
445	0.3699	17.5625	600	0.9528	45.2305	755	0.0414	1.9641
450	0.5745	27.2727	605	0.9797	46.5102	760	0.0358	1.6972
455	0.5075	24.0915	610	0.9965	47.3082	765	0.0315	1.4977
460	0.3559	16.8946	615	0.9983	47.3943	770	0.0266	1.2614
465	0.3078	14.6140	620	0.9878	46.8938	775	0.0218	1.0328
470	0.2477	11.7592	625	0.9616	45.6509	780	0.0190	0.9019
475	0.1935	9.1839	630	0.9259	43.9541	785	0.0150	0.7112
480	0.1887	8.9585	635	0.8744	41.5098	790	0.0153	0.7241
485	0.2055	9.7541	640	0.8209	38.9698	795	0.0124	0.5882
490	0.2322	11.0211	645	0.7574	35.9555	800	0.0070	0.3336
495	0.2759	13.0990	650	0.6906	32.7860			
500	0.3227	15.3204	655	0.6256	29.7000			
505	0.3645	17.3028	660	0.5606	26.6123			
510	0.4022	19.0958	665	0.4980	23.6432			
515	0.4320	20.5105	670	0.4376	20.7766			
520	0.4555	21.6221	675	0.3836	18.2108			
525	0.4759	22.5912	680	0.3326	15.7891			
530	0.4932	23.4133	685	0.2896	13.7471			

TM30

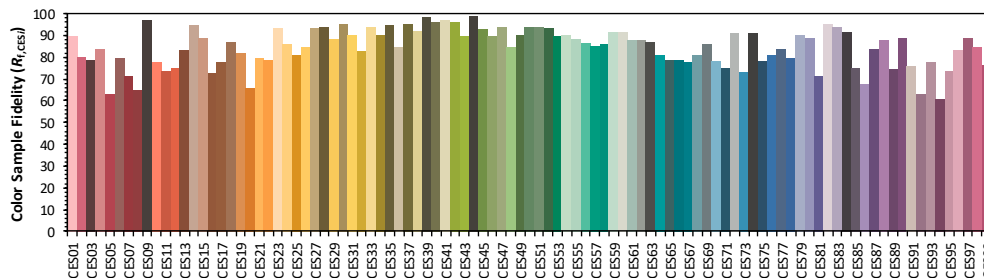
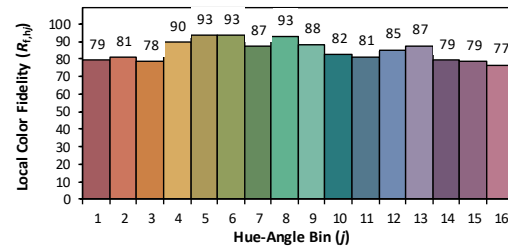
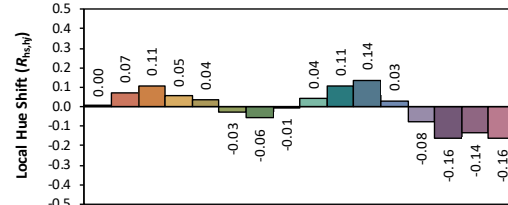
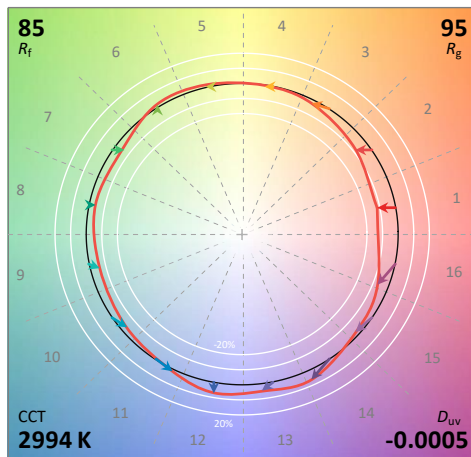
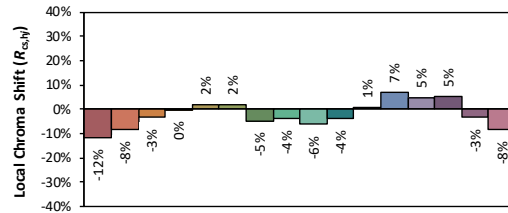
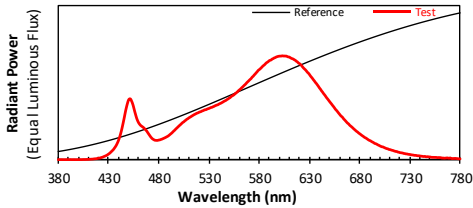
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: AS MART LIGHT CO., LTD

Date: 2022/1/26

Model: AST-LJ01-21WBMUDA1-a (Setting at 3000K)



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

x 0.4367
 y 0.4028
 u' 0.2510
 v' 0.5209

CIE 13.3-1995
(CRI)
 R_a 82
 R_g 5

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Zonal Lumen Tabulation

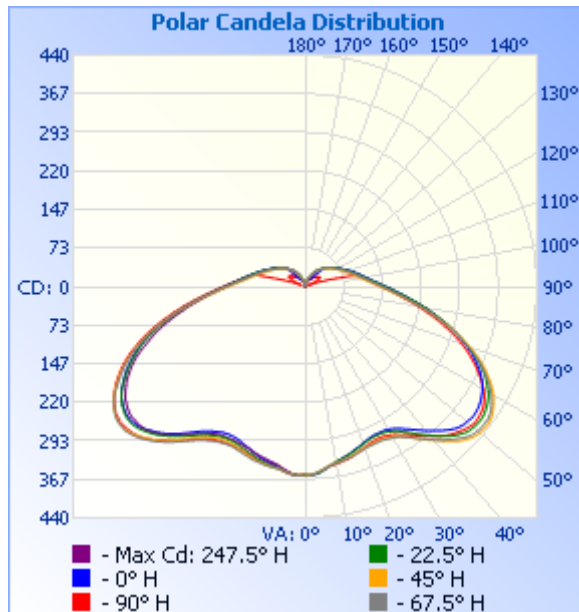
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	278.6	11.3%	11.3%
0-40	497.3	20.1%	20.1%
0-60	1,183.0	47.9%	47.9%
60-90	865.8	35%	35%
70-100	635.8	25.7%	25.7%
90-120	303.1	12.3%	12.3%
0-90	2,048.8	82.9%	82.9%
90-180	422.3	17.1%	17.1%
0-180	2,471.1	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	33.4	1.4%	90-100	137.4	5.6%
10-20	95.0	3.8%	100-110	97.3	3.9%
20-30	150.3	6.1%	110-120	68.4	2.8%
30-40	218.6	8.8%	120-130	51.8	2.1%
40-50	310.7	12.6%	130-140	35.0	1.4%
50-60	375.0	15.2%	140-150	20.2	0.8%
60-70	367.3	14.9%	150-160	9.5	0.4%
70-80	296.1	12.0%	160-170	2.4	0.1%
80-90	202.3	8.2%	170-180	0.2	0%

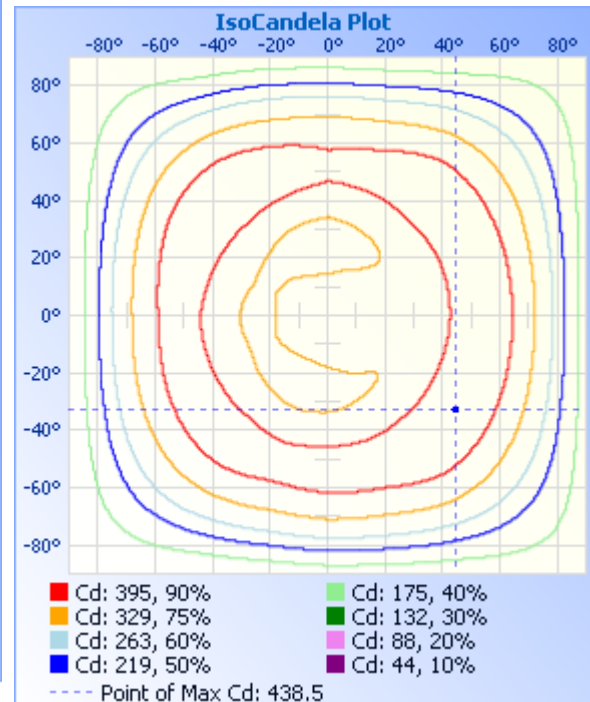
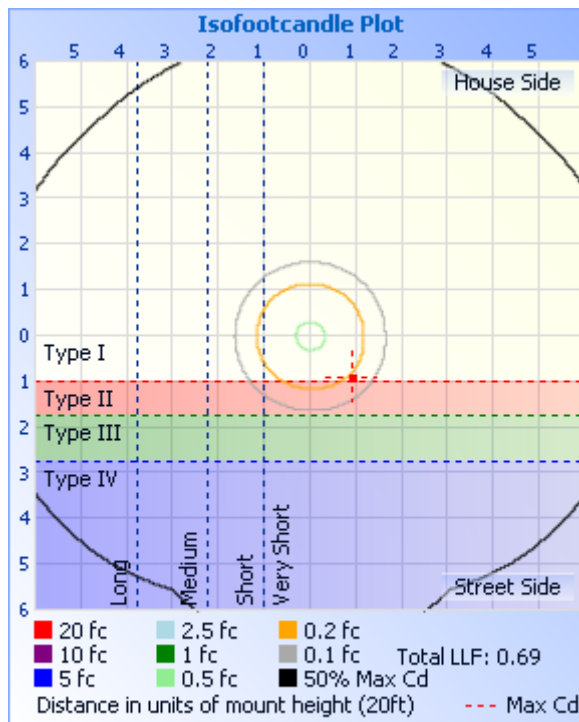
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1.23 fc	152.4 ft	191.0 ft
34.0ft	0.31 fc	304.9 ft	382.0 ft
51.0ft	0.14 fc	457.3 ft	573.0 ft
68.0ft	0.08 fc	609.7 ft	764.1 ft
85.0ft	0.05 fc	762.2 ft	955.1 ft
102.0ft	0.03 fc	914.6 ft	1,146.1 ft

■ Vert. Spread: 154.9°
■ Horiz. Spread: 159.8°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	357	357	357	357	357	357	357	357	357	357	357	357	357	357	357	357	357
1	359	359	358	359	359	359	358	359	359	358	358	359	357	358	358	359	359
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Laboratory: UTEST TECHNICAL LABORATORY A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,

Guangzhou, People's Republic of China engineer@etk-utest.com

Report Format Number BL-FM-SA-012

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BUG Rating

Lum. Classification System (LCS)

<u>LCS Zone</u>	<u>Lumens</u>	<u>%Lamp</u>	<u>%Lum</u>
FL (0-30)	138.9	5.6	5.6
FM (30-60)	452.2	18.3	18.3
FH (60-80)	332.4	13.5	13.5
FVH(80-90)	101.7	4.1	4.1
BL (0-30)	139.7	5.7	5.7
BM (30-60)	452.3	18.3	18.3
BH (60-80)	331.0	13.4	13.4
BVH(80-90)	100.6	4.1	4.1
UL (90-100)	137.3	5.6	5.6
UH (100-180)	285.0	11.5	11.5
Total	2471.1	100.1	100.0
BUG Rating	B1-U3-G2		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-01-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-LJ01-21WBMUDA1-a (Setting at 4000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220101	120.0	60	0.175	20.56	0.979	18.24
9E-A1	277.0	60	0.081	20.53	0.914	13.76
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

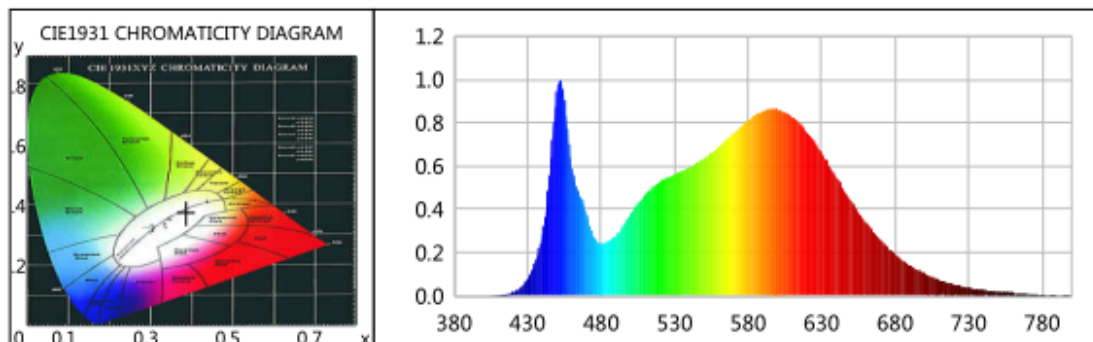
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	11
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	3799	R3	96	R11	81
Duv	-0.0022	R4	82	R12	64
Chromaticity (x, y)	x=0.3880 y=0.3766	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2301 v'=0.5026	R6	88	R14	98
Color Rendering Index (CRI)	84	R7	84	R15	77
R9	11	R8	64	--	--
Rf	84	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-12				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2585.0	2555.2	>=1000(-10%)
Luminous Efficacy (lm/W)	125.73	124.46	Standard: >= 105(-3%)
Most worst Luminous/Highest Watts	124.28		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.0244	535	0.5460	27.6653	690	0.2585	13.0981
385	0.0008	0.0415	540	0.5620	28.4766	695	0.2247	11.3871
390	0.0006	0.0284	545	0.5775	29.2587	700	0.1914	9.6989
395	0.0005	0.0263	550	0.5931	30.0509	705	0.1654	8.3816
400	0.0008	0.0424	555	0.6135	31.0863	710	0.1422	7.2058
405	0.0020	0.1010	560	0.6346	32.1519	715	0.1209	6.1277
410	0.0030	0.1517	565	0.6611	33.4990	720	0.1033	5.2322
415	0.0077	0.3911	570	0.6880	34.8582	725	0.0886	4.4882
420	0.0191	0.9660	575	0.7182	36.3920	730	0.0746	3.7815
425	0.0384	1.9468	580	0.7501	38.0083	735	0.0638	3.2345
430	0.0787	3.9897	585	0.7807	39.5552	740	0.0542	2.7461
435	0.1521	7.7083	590	0.8119	41.1352	745	0.0451	2.2855
440	0.2801	14.1946	595	0.8347	42.2922	750	0.0385	1.9525
445	0.5608	28.4122	600	0.8523	43.1852	755	0.0316	1.6030
450	0.9446	47.8596	605	0.8630	43.7277	760	0.0290	1.4680
455	0.9065	45.9323	610	0.8638	43.7676	765	0.0249	1.2620
460	0.5937	30.0827	615	0.8507	43.1039	770	0.0204	1.0355
465	0.4746	24.0455	620	0.8286	41.9830	775	0.0173	0.8741
470	0.3774	19.1213	625	0.7960	40.3331	780	0.0149	0.7537
475	0.2728	13.8199	630	0.7565	38.3311	785	0.0123	0.6232
480	0.2420	12.2640	635	0.7106	36.0045	790	0.0120	0.6074
485	0.2537	12.8565	640	0.6591	33.3938	795	0.0074	0.3729
490	0.2767	14.0214	645	0.6050	30.6530	800	0.0064	0.3221
495	0.3209	16.2592	650	0.5472	27.7233			
500	0.3754	19.0204	655	0.4907	24.8611			
505	0.4248	21.5234	660	0.4393	22.2587			
510	0.4666	23.6426	665	0.3882	19.6718			
515	0.5013	25.3980	670	0.3396	17.2082			
520	0.5265	26.6762	675	0.2971	15.0559			
525	0.5460	27.6653	680	0.2585	13.0981			
530	0.5620	28.4766	685	0.2247	11.3871			

TM30

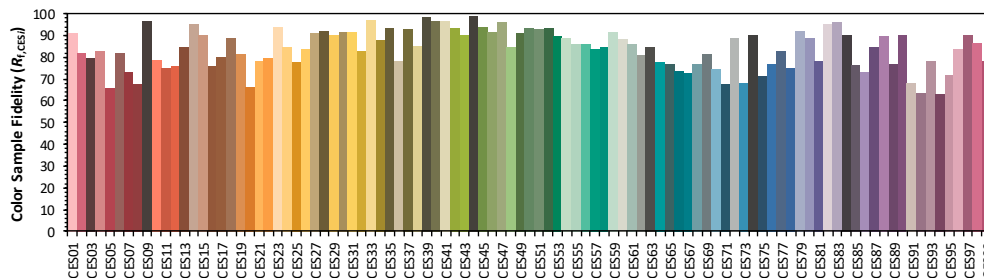
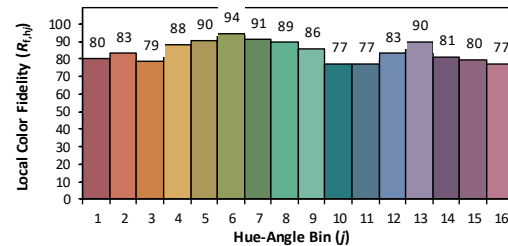
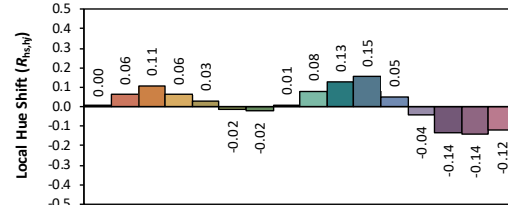
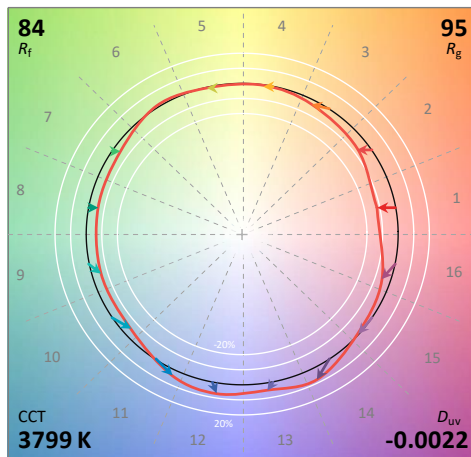
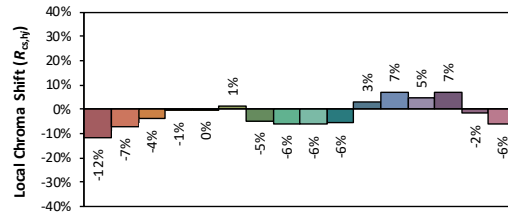
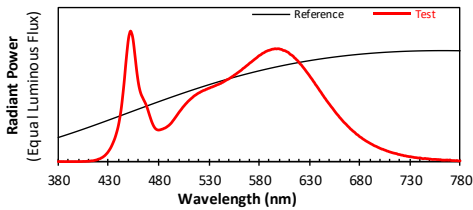
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: AS MART LIGHT CO., LTD

Date: 2022/1/26

Model: AST-LJ01-21WBMUDA1-a (Setting at 4000K)



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

x 0.3880
 y 0.3766
 u' 0.2301
 v' 0.5026

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 11

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-01-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-LJ01-21WBMUDA1-a (Setting at 5000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220101	120.0	60	0.181	21.23	0.98	18.17
9E-A1	277.0	60	0.084	21.2	0.915	13.97
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

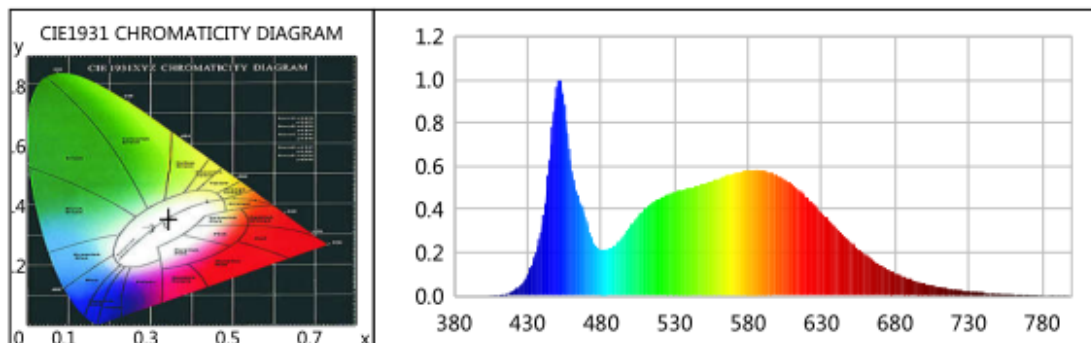
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	1
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	4941	R3	93	R11	79
Duv	0.0013	R4	80	R12	54
Chromaticity (x, y)	x=0.3471 y=0.3557	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2112 v'=0.4869	R6	83	R14	96
Color Rendering Index (CRI)	82	R7	86	R15	74
R9	1	R8	64	--	--
Rf	82	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-13				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2582.0	2551.4	>=1000(-10%)
Luminous Efficacy (lm/W)	121.62	120.35	Standard: >= 105(-3%)
Most worst Luminous/Highest Watts	120.18		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0169	535	0.4692	31.4331	690	0.1435	9.6140
385	0.0008	0.0523	540	0.4796	32.1319	695	0.1224	8.1995
390	0.0006	0.0418	545	0.4896	32.7997	700	0.1054	7.0590
395	0.0004	0.0292	550	0.4973	33.3148	705	0.0905	6.0631
400	0.0008	0.0551	555	0.5083	34.0529	710	0.0787	5.2738
405	0.0021	0.1395	560	0.5191	34.7789	715	0.0657	4.4019
410	0.0036	0.2380	565	0.5311	35.5810	720	0.0568	3.8026
415	0.0098	0.6597	570	0.5417	36.2915	725	0.0482	3.2262
420	0.0230	1.5383	575	0.5558	37.2343	730	0.0409	2.7425
425	0.0482	3.2315	580	0.5648	37.8342	735	0.0352	2.3609
430	0.0972	6.5097	585	0.5738	38.4425	740	0.0292	1.9543
435	0.1855	12.4241	590	0.5809	38.9170	745	0.0259	1.7368
440	0.3340	22.3759	595	0.5825	39.0209	750	0.0213	1.4282
445	0.6308	42.2560	600	0.5802	38.8695	755	0.0174	1.1673
450	0.9702	64.9995	605	0.5711	38.2567	760	0.0164	1.1011
455	0.8865	59.3896	610	0.5589	37.4426	765	0.0146	0.9772
460	0.5772	38.6669	615	0.5398	36.1619	770	0.0111	0.7463
465	0.4489	30.0704	620	0.5152	34.5113	775	0.0097	0.6518
470	0.3441	23.0535	625	0.4868	32.6119	780	0.0085	0.5662
475	0.2454	16.4385	630	0.4551	30.4894	785	0.0067	0.4464
480	0.2138	14.3211	635	0.4197	28.1143	790	0.0068	0.4532
485	0.2183	14.6212	640	0.3857	25.8370	795	0.0047	0.3116
490	0.2375	15.9100	645	0.3484	23.3435	800	0.0032	0.2118
495	0.2751	18.4325	650	0.3134	20.9930			
500	0.3234	21.6628	655	0.2797	18.7404			
505	0.3662	24.5321	660	0.2471	16.5521			
510	0.4034	27.0258	665	0.2162	14.4870			
515	0.4323	28.9576	670	0.1885	12.6283			
520	0.4529	30.3396	675	0.1648	11.0414			
525	0.4692	31.4331	680	0.1435	9.6140			
530	0.4796	32.1319	685	0.1224	8.1995			

TM30

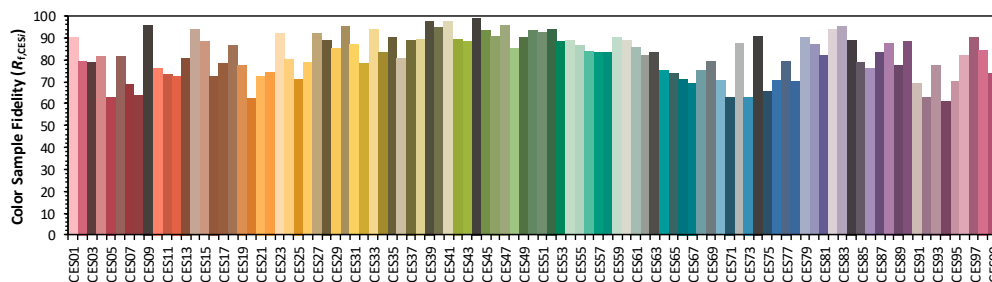
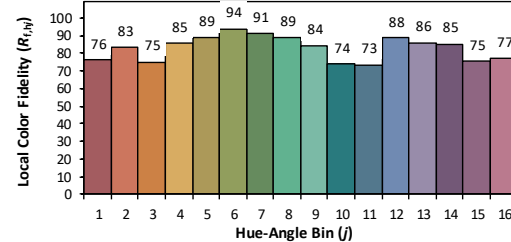
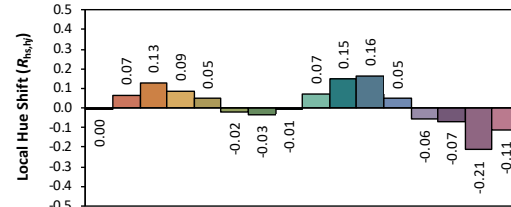
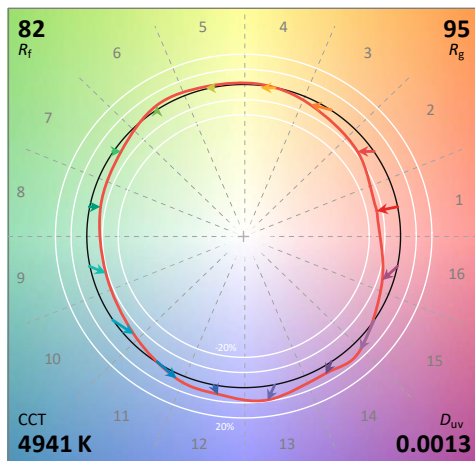
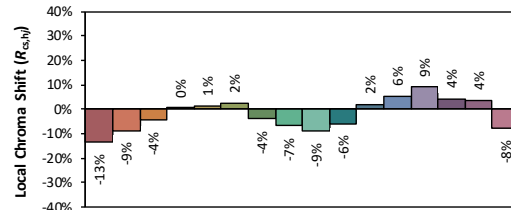
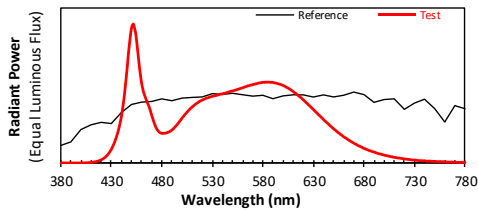
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-XX80RC35003P1

Manufacturer: ASMA RT LIGHT CO., LTD

Date: 2022/1/26

Model: AST-LJ01-21WBMUDA1-a (Setting at 5000K)



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

x 0.3471
 y 0.3557
 u' 0.2112
 v' 0.4869

CIE 13.3-1995
(CRI)
 R_a 82
 R_9 1

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ200006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

******* END OF REPORT *******