



Report No.: UTC2304011E-B

## LM-79-08 Test Report

For

# Beyond LED Technology

(Brand Name: Beyond)

1939 Parker Court, Stone Mountain, GA 30087

**Direct Linear Ambient Luminaires**

## Low-Bay Luminaires for Commercial and Industrial Buildings

Model name(s): BLT-LA02-40W4FTBTA1-WH30/35/40/50

Remark: a=can be any two letters to represent lamp colors, WH=White, or Customized;  
b=can be "R"/ "M" or blank for AC Motion PIR sensor provided or DC Motion Microwave sensor provided or not;

c=can be "E" or blank for emergency driver provided or not;

d=can be any digits for CCT, 30/35/40/50K.

Representative (Tested) Model:

AST-LA02-40W4FTBTA1-abc30

AST-LA02-40W4FTBTA1-abc35

AST-LA02-40W4FTBTA1-abc40

AST-LA02-40W4FTBTA1-abc50

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

Test & Report By:

*Winnie Wu*

Engineer: Winnie Wu

Date: 2023-07-14

Review By:

*Jason Luo*

Manager: Jason Luo

**1.1 Product Information:**

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED Technology	
Model Number	BLT-LA02-40W4FTBTA1-	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires Low-Bay Luminaires for Commercial and Industrial Buildings	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	40W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K, 5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RA35002U1	
Sample Number	UTC2304011E-B1-4	
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	2023-06-28
Date of Test	2023-06-30
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	BL-QP-033

## 1.3 Test Methods

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b> Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>, 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 <math>1^{\circ}</math> vertical intervals and <math>22.5^{\circ}</math> horizontal intervals. Goniophotometer far field detector <math>f1' = 1.42\%</math>, Test distance: 14.14m</p>
<p><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b> Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>. 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-LA02-40W4FTBTA1-abcd:1.0593</p>
<p><b>3) Electrical Measurements:</b> Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>. 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.</p>

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-06-30	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	BLT-LA02-40W4FTBTA1 WH30/35/40/50		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230401	120.0	60	0.331	39.67	0.998	3.73
1E-B1	277.0	60	0.144	38.77	0.971	10.28
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

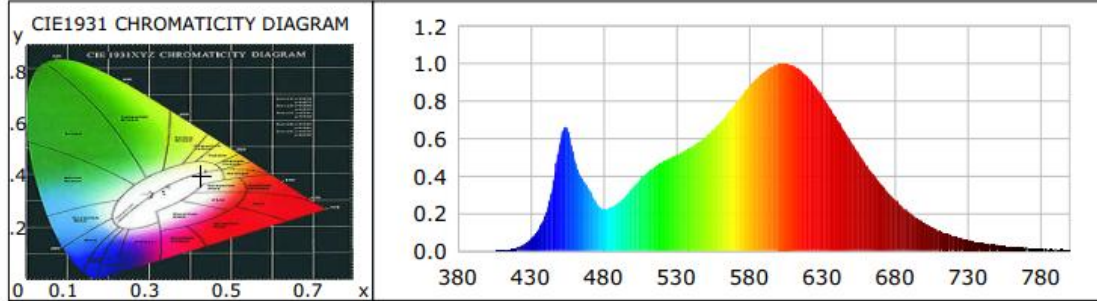
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result				
Test Voltage (V)	120.0	R1	83	R9	12
Frequency (Hz)	60	R2	93	R10	84
CCT (K)	3093	R3	95	R11	81
Duv	-0.0023	R4	81	R12	73
Chromaticity (x, y)	x=0.4274 y=0.3951	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2482 v'(v')=0.5164	R6	92	R14	98
Color Rendering Index (CRI)	84	R7	81	R15	76
R9	12	R8	60	--	--
Rf	85	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11				

### 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)	4864.7	4751.7	Category1: >=375lm/ft(-10%) Category2: >=5000-10000(-10%)
Luminous Efficacy (lm/W)	122.63	122.56	Standard: >= 115(-3%)
Most worst Luminous/Highest	119.78		
Zonal lumens in the 0-60° zone (%)	62.20	--	>=40 (-3)%
Zonal lumens in the 20-50° zone (%)	38.9	--	>=30 (-10)%
Beam Angle (°)	120.7	--	--
Center Beam Candle Power (cd)	1321	--	--

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0102	535	0.4929	51.6141	690	0.3600	37.6991
385	0.0005	0.0565	540	0.5124	53.6512	695	0.3131	32.7880
390	0.0004	0.0412	545	0.5309	55.5939	700	0.2720	28.4805
395	0.0004	0.0415	550	0.5541	58.0169	705	0.2364	24.7511
400	0.0005	0.0520	555	0.5782	60.5450	710	0.2045	21.4182
405	0.0014	0.1449	560	0.6081	63.6786	715	0.1748	18.2984
410	0.0028	0.2947	565	0.6450	67.5342	720	0.1504	15.7453
415	0.0075	0.7819	570	0.6854	71.7723	725	0.1284	13.4422
420	0.0170	1.7819	575	0.7319	76.6375	730	0.1087	11.3844
425	0.0335	3.5124	580	0.7788	81.5523	735	0.0936	9.8028
430	0.0623	6.5254	585	0.8294	86.8508	740	0.0797	8.3485
435	0.1115	11.6707	590	0.8784	91.9783	745	0.0686	7.1855
440	0.1913	20.0363	595	0.9190	96.2313	750	0.0577	6.0389
445	0.3392	35.5196	600	0.9561	100.1121	755	0.0486	5.0877
450	0.5696	59.6437	605	0.9836	102.9902	760	0.0429	4.4965
455	0.6556	68.6499	610	0.9995	104.6545	765	0.0375	3.9275
460	0.4996	52.3117	615	0.9989	104.5917	770	0.0313	3.2757
465	0.3901	40.8474	620	0.9900	103.6673	775	0.0272	2.8457
470	0.3312	34.6853	625	0.9669	101.2413	780	0.0236	2.4673
475	0.2595	27.1695	630	0.9293	97.3067	785	0.0191	2.0028
480	0.2241	23.4651	635	0.8813	92.2805	790	0.0193	2.0184
485	0.2311	24.1989	640	0.8263	86.5196	795	0.0147	1.5434
490	0.2551	26.7136	645	0.7674	80.3560	800	0.0098	1.0312
495	0.2913	30.4990	650	0.7052	73.8410			
500	0.3364	35.2267	655	0.6422	67.2464			
505	0.3793	39.7156	660	0.5814	60.8753			
510	0.4177	43.7342	665	0.5206	54.5104			
515	0.4475	46.8556	670	0.4633	48.5111			
520	0.4719	49.4169	675	0.4087	42.7924			
525	0.4929	51.6141	680	0.3600	37.6991			
530	0.5124	53.6512	685	0.3131	32.7880			



**TM30**

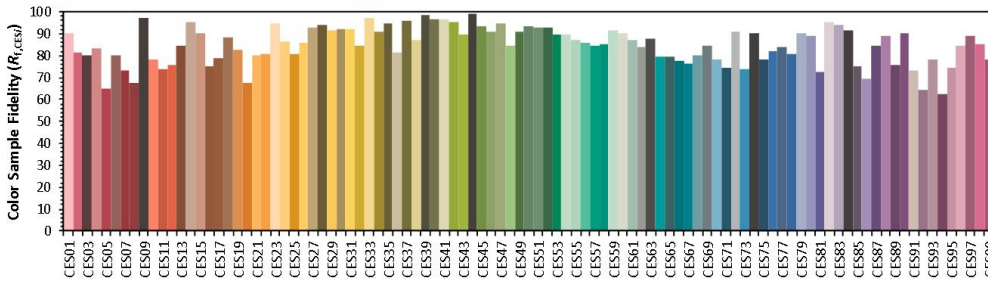
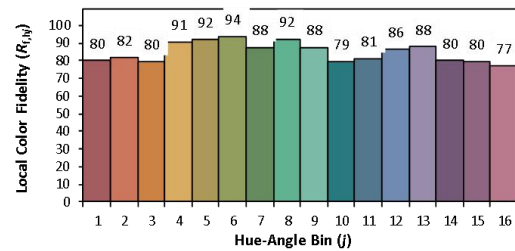
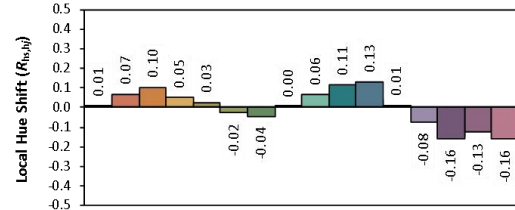
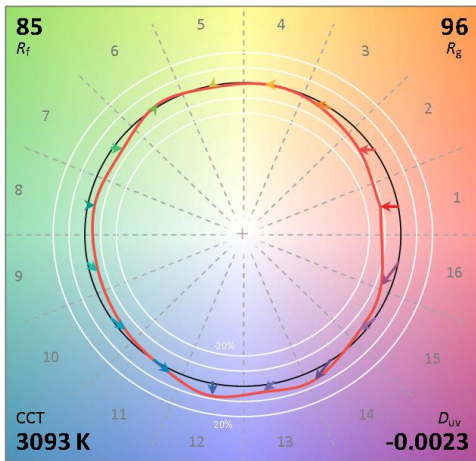
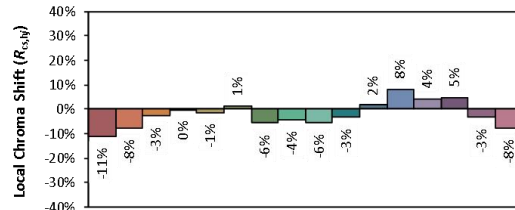
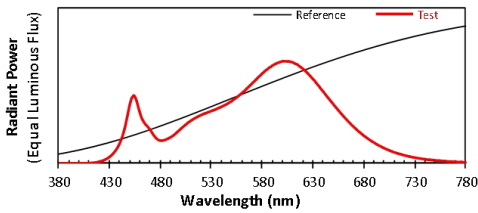
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35002U1

Manufacturer: ASHART LIGHT CO., LTD

Date: 2023/6/30

Model: AST-LA02-40W4FTBTA1-abc30



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

$x$  0.4274  
 $y$  0.3951  
 $u'$  0.2482  
 $v'$  0.5164

CIE 13.3-1995 (CRI)  
 $R_a$  84  
 $R_g$  12

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

## Zonal Lumen Tabulation

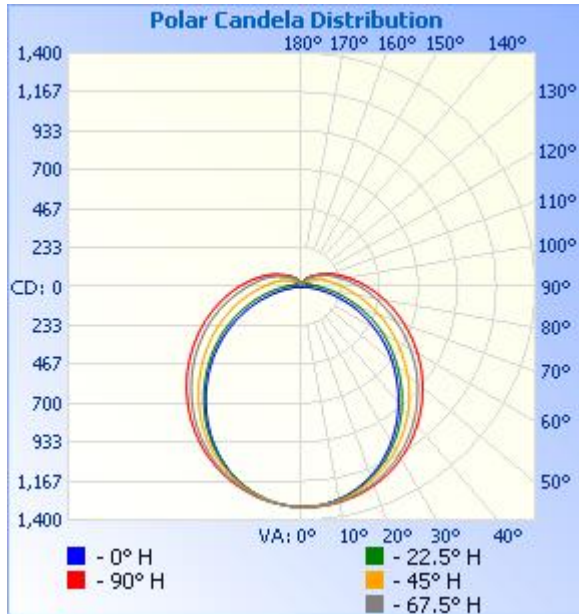
### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	1,026.0	21.1%	21.1%
0-40	1,682.8	34.6%	34.6%
0-60	3,025.7	62.2%	62.2%
60-90	1,261.6	25.9%	25.9%
70-100	909.7	18.7%	18.7%
90-120	432.7	8.9%	8.9%
0-90	4,287.3	88.1%	88.1%
90-180	577.2	11.9%	11.9%
0-180	4,864.5	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	125.0	2.6%	90-100	201.0	4.1%
10-20	358.0	7.4%	100-110	139.8	2.9%
20-30	543.0	11.2%	110-120	91.9	1.9%
30-40	656.8	13.5%	120-130	60.3	1.2%
40-50	691.2	14.2%	130-140	39.4	0.8%
50-60	651.7	13.4%	140-150	24.2	0.5%
60-70	552.9	11.4%	150-160	13.2	0.3%
70-80	420.0	8.6%	160-170	5.9	0.1%
80-90	288.7	5.9%	170-180	1.6	0%

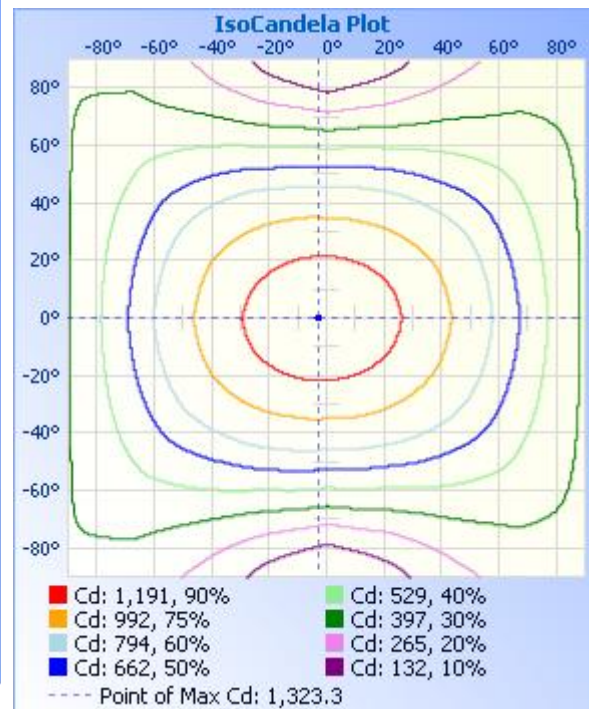
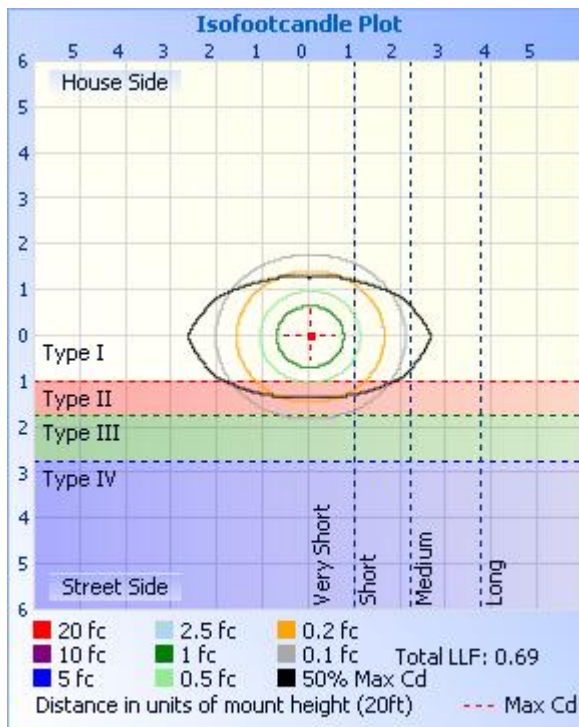
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	4.57 fc	44.6 ft	85.2 ft
34.0ft	1.14 fc	89.2 ft	170.5 ft
51.0ft	0.51 fc	133.7 ft	255.7 ft
68.0ft	0.29 fc	178.3 ft	340.9 ft
85.0ft	0.18 fc	222.9 ft	426.2 ft
102.0ft	0.13 fc	267.5 ft	511.4 ft

■ Vert. Spread: 105.3°  
■ Horiz. Spread: 136.5°





**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	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321
1	1321	1322	1323	1321	1322	1322	1322	1321	1321	1321	1320	1321	1321	1321	1322	1320	1321
2	1320	1321	1322	1321	1323	1322	1322	1320	1320	1319	1320	1319	1320	1320	1320	1319	1320
3	1319	1320	1321	1322	1323	1322	1321	1319	1318	1317	1317	1318	1318	1318	1318	1318	1319
4	1317	1318	1318	1321	1322	1321	1320	1317	1316	1315	1315	1316	1316	1316	1316	1316	1317
5	1314	1316	1318	1320	1322	1320	1318	1315	1313	1312	1313	1313	1313	1314	1314	1314	1314
6	1312	1313	1316	1319	1320	1319	1316	1312	1309	1309	1310	1310	1310	1311	1312	1310	1312
7	1308	1310	1313	1317	1319	1317	1314	1309	1306	1305	1306	1306	1307	1308	1308	1307	1308
8	1304	1307	1310	1314	1317	1315	1310	1306	1301	1300	1301	1303	1305	1304	1304	1302	1304
9	1299	1302	1306	1311	1314	1312	1306	1301	1296	1295	1297	1299	1301	1300	1300	1297	1299
10	1293	1297	1302	1308	1312	1310	1302	1296	1291	1289	1292	1294	1298	1296	1295	1292	1293
11	1287	1291	1298	1305	1309	1306	1297	1290	1283	1283	1287	1289	1293	1291	1290	1286	1287
12	1281	1286	1293	1302	1305	1302	1292	1285	1276	1277	1281	1284	1289	1286	1284	1279	1281
13	1274	1278	1287	1297	1302	1298	1287	1277	1270	1269	1273	1279	1282	1281	1278	1272	1274
14	1266	1271	1281	1292	1298	1293	1281	1271	1262	1261	1266	1273	1278	1275	1270	1265	1266
15	1258	1264	1274	1287	1294	1289	1274	1263	1253	1254	1260	1267	1272	1269	1264	1257	1258
16	1249	1255	1268	1282	1290	1283	1268	1255	1244	1244	1252	1261	1267	1262	1256	1249	1249
17	1241	1247	1260	1276	1286	1277	1259	1246	1234	1235	1244	1253	1260	1256	1248	1240	1241
18	1231	1237	1252	1270	1279	1271	1251	1237	1224	1225	1235	1247	1254	1249	1240	1230	1231
19	1220	1228	1244	1264	1274	1265	1243	1227	1214	1216	1226	1238	1246	1241	1231	1220	1220
20	1209	1219	1236	1257	1268	1258	1235	1216	1203	1205	1217	1231	1240	1233	1221	1210	1209
21	1198	1208	1227	1249	1261	1251	1226	1206	1191	1194	1207	1222	1232	1225	1211	1199	1198
22	1187	1197	1217	1242	1255	1243	1216	1194	1179	1183	1196	1214	1224	1216	1201	1188	1187
23	1175	1187	1207	1233	1248	1234	1206	1183	1165	1171	1186	1205	1217	1207	1191	1176	1175
24	1162	1174	1197	1224	1241	1227	1196	1171	1153	1159	1175	1195	1207	1198	1180	1163	1162
25	1148	1163	1187	1215	1233	1218	1185	1158	1140	1147	1163	1186	1199	1188	1168	1151	1148
26	1134	1150	1176	1206	1225	1209	1174	1145	1126	1132	1152	1176	1189	1179	1156	1137	1134
27	1120	1137	1165	1196	1217	1199	1162	1132	1113	1119	1140	1166	1181	1169	1143	1123	1120
28	1106	1123	1154	1188	1208	1189	1151	1118	1097	1106	1128	1155	1171	1158	1131	1109	1106

29	1091	1110	1141	1178	1199	1179	1139	1102	1082	1092	1115	1144	1161	1147	1118	1095	1091
30	1076	1096	1129	1166	1189	1168	1126	1087	1067	1078	1101	1132	1151	1136	1106	1080	1076
31	1060	1082	1117	1155	1180	1158	1114	1072	1051	1061	1088	1120	1140	1124	1092	1065	1060
32	1044	1067	1104	1146	1171	1147	1100	1058	1036	1046	1075	1109	1130	1110	1078	1050	1044
33	1028	1052	1091	1134	1159	1135	1086	1042	1017	1032	1061	1097	1117	1099	1065	1034	1028
34	1011	1037	1077	1123	1149	1123	1072	1026	1001	1016	1047	1084	1106	1088	1050	1018	1011
35	995	1019	1063	1111	1138	1111	1058	1008	984	1000	1031	1071	1095	1075	1035	1002	995
36	977	1003	1049	1098	1127	1099	1044	991	966	983	1016	1058	1084	1062	1021	985	977
37	960	987	1035	1086	1116	1085	1028	974	949	965	1002	1046	1070	1049	1006	969	960
38	942	970	1021	1073	1103	1073	1013	958	930	949	987	1032	1059	1037	991	953	942
39	922	953	1006	1061	1092	1060	999	939	912	931	971	1019	1047	1023	975	935	922
40	903	935	992	1047	1080	1047	982	923	894	914	955	1004	1034	1009	959	918	903
41	884	917	977	1034	1067	1033	966	906	876	895	939	991	1022	996	943	901	884
42	867	899	961	1021	1055	1019	951	889	859	878	923	977	1008	983	928	885	867
43	849	882	945	1009	1041	1004	933	874	839	860	907	963	995	969	910	868	849
44	829	865	929	994	1029	990	917	856	820	842	889	948	982	955	893	852	829
45	810	845	913	980	1016	976	900	839	801	822	873	934	968	941	876	834	810
46	791	826	897	965	1003	962	883	822	782	804	858	919	955	926	860	816	791
47	772	806	880	952	989	946	865	805	764	785	842	905	941	912	844	799	772
48	752	789	865	937	975	931	848	787	742	767	825	890	928	896	827	780	752
49	733	770	848	922	961	916	832	769	723	749	807	875	915	881	810	763	733
50	714	750	830	907	948	901	815	751	704	729	791	862	900	867	795	745	714
51	694	732	813	893	934	884	798	733	685	711	774	848	886	853	777	728	694
52	675	714	794	878	918	870	779	715	664	693	759	833	874	838	759	710	675
53	655	694	777	865	906	855	762	696	644	674	742	819	859	823	743	693	655
54	634	675	760	847	891	840	745	675	624	656	725	803	845	806	727	672	634
55	614	657	744	832	878	825	729	656	604	635	708	788	830	792	711	654	614
56	593	639	726	816	862	808	711	637	583	617	693	774	816	776	694	636	593
57	573	620	709	801	848	793	694	617	563	598	677	759	802	761	677	616	573
58	553	601	692	784	833	778	678	595	542	579	659	745	788	745	661	595	553
59	530	583	676	770	818	762	662	576	523	561	643	729	772	730	645	576	530

60	510	565	659	754	804	747	646	555	502	542	627	714	758	715	629	556	510
61	489	546	642	740	789	731	629	536	482	522	611	700	745	701	613	537	489
62	469	526	626	725	774	716	614	515	460	504	594	685	730	686	596	518	469
63	449	507	608	707	759	702	599	495	440	485	579	670	716	669	581	497	449
64	427	488	592	692	744	686	583	475	419	467	563	656	701	655	565	478	427
65	407	469	576	678	730	670	566	456	397	449	548	642	688	641	551	460	407
66	387	448	561	662	714	655	550	438	376	431	533	628	674	625	534	441	387
67	367	429	543	647	699	640	535	420	356	413	518	614	661	611	519	422	367
68	346	410	529	630	685	627	519	400	336	393	501	599	646	597	503	402	346
69	325	392	511	615	669	610	502	383	314	375	486	585	632	582	489	385	325
70	305	373	496	599	655	596	486	366	294	358	472	571	619	568	474	365	305
71	283	356	480	585	641	582	470	347	274	341	457	558	604	553	459	347	283
72	264	339	466	570	626	568	455	331	254	323	442	543	592	540	446	331	264
73	243	322	450	556	612	553	439	314	234	304	428	530	578	525	432	313	243
74	223	305	436	541	597	539	423	298	213	288	415	516	565	512	417	297	223
75	204	287	421	526	584	526	409	281	194	273	400	501	551	498	403	281	204
76	184	271	407	514	570	512	395	265	175	257	386	488	538	483	388	266	184
77	166	255	393	500	556	499	381	250	157	243	374	475	525	471	374	250	166
78	147	240	378	487	543	484	367	235	137	227	361	462	513	458	359	236	147
79	129	226	366	475	528	471	355	220	120	213	348	449	501	446	347	222	129
80	113	210	353	463	515	458	343	204	104	200	335	436	488	433	333	206	113
81	95	196	340	449	503	443	330	191	86	185	324	423	475	422	321	192	95
82	79	183	326	438	489	430	319	177	71	172	312	411	463	409	308	177	79
83	65	170	314	427	478	418	308	164	57	160	300	399	452	397	296	164	65
84	51	157	304	416	464	406	296	151	44	148	288	387	440	386	284	153	51
85	39	145	293	406	452	394	285	140	33	136	276	375	430	375	273	140	39
86	28	135	283	394	440	383	274	130	23	125	266	364	419	366	263	128	28
87	19	125	274	383	427	371	262	121	14	116	256	354	407	355	253	117	19
88	12	118	266	372	416	360	253	111	8	107	246	343	396	345	243	108	12
89	7	111	258	361	404	350	244	105	4	100	237	334	386	336	235	100	7
90	5	106	248	350	393	339	237	100	3	95	229	326	376	328	227	93	5

91	5	100	240	341	381	329	228	95	3	90	221	315	365	319	220	89	5
92	5	96	232	331	371	320	221	91	3	87	213	306	355	309	212	85	5
93	5	91	223	320	360	311	214	87	3	83	207	298	344	300	204	81	5
94	5	87	216	310	350	302	208	83	3	79	201	289	335	291	197	78	5
95	4	82	208	301	341	293	201	79	3	75	196	281	326	282	190	73	4
96	5	79	201	292	330	286	195	75	3	70	188	274	316	274	183	69	5
97	5	74	194	284	320	278	188	70	4	67	182	266	308	266	177	65	5
98	5	70	188	275	311	270	182	67	3	62	176	259	299	258	171	61	5
99	4	66	181	266	301	263	176	63	3	60	169	252	290	249	165	58	4
100	5	63	175	259	293	255	170	60	4	57	163	244	281	241	159	56	5
101	5	60	169	251	284	248	164	56	4	53	158	237	272	234	153	52	5
102	5	57	163	243	275	241	158	54	3	51	151	231	265	227	149	50	5
103	5	55	158	236	267	233	152	51	3	48	146	224	257	220	143	48	5
104	5	52	152	229	258	226	146	49	4	46	141	217	250	213	138	46	5
105	5	50	147	222	251	219	141	47	4	44	136	210	241	207	133	44	5
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107	5	46	137	209	235	206	131	43	4	41	127	197	227	194	124	41	5
108	6	43	133	203	228	199	126	41	4	39	123	190	220	189	120	38	6
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113	6	36	103	172	195	169	97	34	5	32	95	162	187	161	92	31	6
114	7	35	99	167	188	163	93	33	5	31	92	157	182	156	88	30	7
115	6	34	95	160	182	156	90	33	6	31	88	151	176	150	86	29	6
116	6	34	92	152	176	149	88	33	5	30	86	143	170	143	83	29	6
117	6	33	89	146	168	143	85	32	6	29	83	137	163	136	81	29	6
118	7	33	86	140	160	137	83	31	5	29	80	132	156	131	78	28	7
119	7	32	84	135	155	132	80	31	6	29	78	127	149	126	76	27	7
120	7	32	81	130	150	128	78	30	6	28	75	123	144	122	73	28	7
121	7	31	79	127	145	124	76	30	6	28	72	119	140	118	71	27	7

122	7	31	77	123	140	120	73	29	7	27	70	115	135	114	69	26	7
123	8	30	75	119	136	116	72	29	7	26	69	112	130	111	67	25	8
124	8	30	72	115	131	112	70	28	6	27	67	109	126	107	65	26	8
125	8	29	71	112	127	109	68	28	7	26	65	105	122	103	63	25	8
126	8	29	69	108	123	105	66	28	7	26	63	102	118	100	61	25	8
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136	9	25	54	79	88	77	52	25	9	23	48	73	83	72	46	22	9
137	9	25	53	76	85	75	51	25	9	22	47	71	80	70	46	21	9
138	9	25	51	74	83	73	50	24	9	21	46	69	77	68	44	21	9
139	9	24	50	72	80	70	48	24	9	21	45	67	75	66	43	21	9
140	9	24	49	70	77	68	47	24	9	21	43	64	72	64	42	20	9
141	9	24	47	68	75	66	45	24	9	20	42	62	70	62	41	20	9
142	9	24	47	66	72	64	44	23	9	20	41	61	67	60	40	19	9
143	9	23	45	64	70	62	43	23	10	19	40	58	64	58	39	19	9
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145	10	22	43	60	66	59	41	22	10	18	38	54	60	54	36	18	10
146	10	22	42	58	63	57	40	22	10	18	37	53	58	52	35	18	10
147	10	22	40	56	61	55	39	22	10	18	35	50	56	50	34	17	10
148	10	22	39	54	60	53	38	21	10	17	33	49	54	48	33	17	10
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152	10	21	36	48	51	46	35	21	11	16	28	42	46	42	27	16	10



153	10	21	35	45	50	44	33	20	11	16	27	40	44	40	26	16	10
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157	11	20	30	39	42	38	29	20	11	15	24	34	38	34	23	16	11
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163	13	19	25	31	33	30	24	19	13	14	19	25	28	25	18	14	13
164	13	18	24	29	31	29	23	18	13	14	18	24	27	23	17	13	13
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166	13	18	23	26	27	26	22	18	13	14	16	20	24	20	16	13	13
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179	17	17	16	14	12	14	16	17	17	17	17	16	10	16	16	17	17
180	17	17	17	16	6	16	17	17	17	17	17	16	6	16	16	17	17

**2.2 Electrical, Photometric and Chromaticity Measurements**  
(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-06-30	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-LA02-40W4FTBTA1-abc35		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230401	120.0	60	0.325	38.93	0.998	3.7
1E-B2	277.0	60	0.141	38.08	0.972	10.33
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

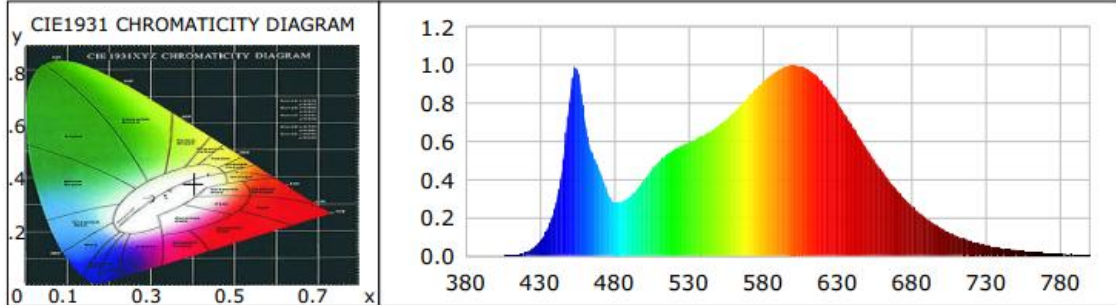
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	18
Frequency (Hz)	60	R2	94	R10	85
CCT (K)	3513	R3	95	R11	82
Duv	-0.0036	R4	83	R12	69
Chromaticity (x, y)	x=0.4009 y=0.3804	R5	85	R13	88
Chromaticity (u', v')	u(u')=0.2371 v'(v')=0.5062	R6	91	R14	98
Color Rendering Index (CRI)	85	R7	83	R15	79
R9	18	R8	64	--	--
Rf	85	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-11				

**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)	5176.1	5065.8	Category1: >=375lm/ft(-10%) Category2: >=5000-10000(-10%)
Luminous Efficacy (lm/W)	132.96	133.03	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	130.13		

**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	0.0268	535	0.5757	59.6457	690	0.3441	35.6469
385	0.0006	0.0580	540	0.5931	61.4475	695	0.3006	31.1374
390	0.0008	0.0823	545	0.6115	63.3497	700	0.2613	27.0670
395	0.0007	0.0687	550	0.6322	65.4934	705	0.2267	23.4848
400	0.0011	0.1160	555	0.6528	67.6278	710	0.1953	20.2276
405	0.0014	0.1405	560	0.6802	70.4644	715	0.1674	17.3419
410	0.0029	0.2982	565	0.7112	73.6842	720	0.1444	14.9632
415	0.0077	0.7970	570	0.7475	77.4387	725	0.1226	12.7006
420	0.0186	1.9246	575	0.7869	81.5251	730	0.1054	10.9208
425	0.0383	3.9714	580	0.8281	85.7911	735	0.0897	9.2955
430	0.0753	7.8054	585	0.8699	90.1254	740	0.0771	7.9843
435	0.1402	14.5219	590	0.9119	94.4766	745	0.0662	6.8537
440	0.2505	25.9559	595	0.9431	97.6987	750	0.0550	5.7018
445	0.4545	47.0833	600	0.9734	100.8468	755	0.0470	4.8675
450	0.8059	83.4947	605	0.9907	102.6324	760	0.0410	4.2516
455	0.9800	101.5269	610	0.9997	103.5675	765	0.0369	3.8183
460	0.7303	75.6553	615	0.9937	102.9492	770	0.0304	3.1466
465	0.5379	55.7299	620	0.9788	101.4025	775	0.0275	2.8459
470	0.4500	46.6224	625	0.9520	98.6296	780	0.0220	2.2764
475	0.3406	35.2833	630	0.9094	94.2125	785	0.0192	1.9904
480	0.2811	29.1262	635	0.8604	89.1410	790	0.0168	1.7443
485	0.2826	29.2742	640	0.8029	83.1763	795	0.0132	1.3723
490	0.3070	31.8071	645	0.7413	76.8009	800	0.0111	1.1545
495	0.3456	35.8042	650	0.6818	70.6333			
500	0.3969	41.1188	655	0.6195	64.1813			
505	0.4488	46.4931	660	0.5586	57.8660			
510	0.4922	50.9912	665	0.4995	51.7495			
515	0.5264	54.5341	670	0.4443	46.0294			
520	0.5541	57.4045	675	0.3921	40.6163			
525	0.5757	59.6457	680	0.3441	35.6469			
530	0.5931	61.4475	685	0.3006	31.1374			

**TM30**

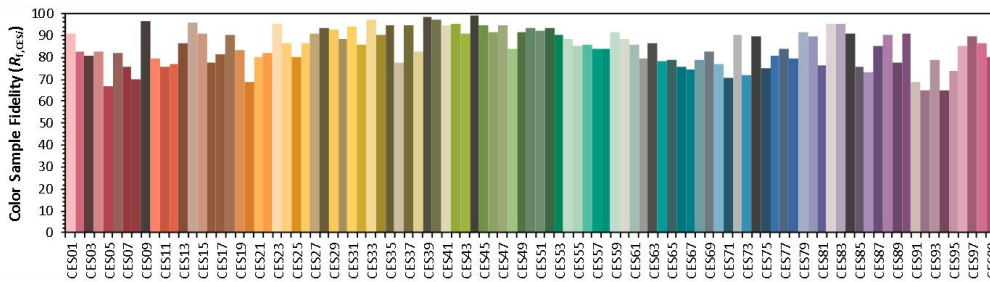
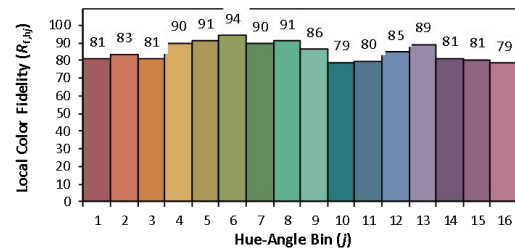
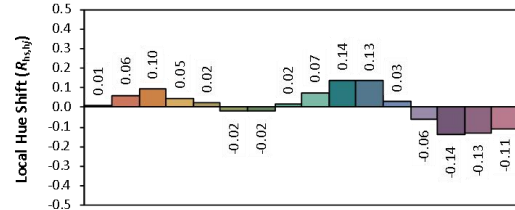
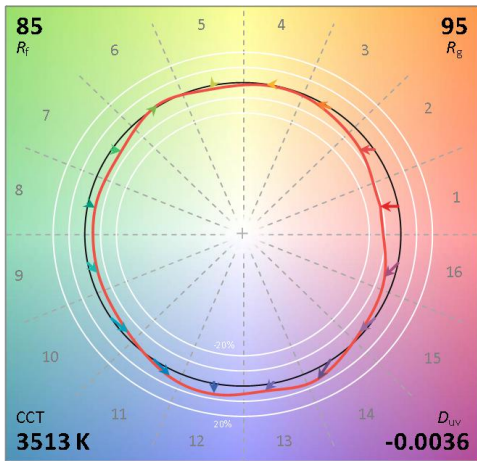
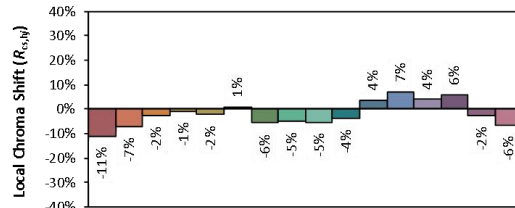
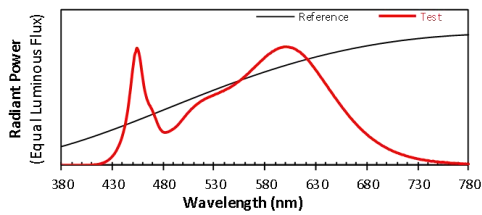
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35002U1  
L128-5080RA35002U1

Manufacturer: ASmart LIGHT CO., LTD

Date: 2023/6/30

Model: AST-LA02-40W4FTBTA1-abc35



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

x 0.4009  
y 0.3804  
u' 0.2371  
v' 0.5062

CIE 13.3-1995 (CRI)  
R<sub>a</sub> 85  
R<sub>9</sub> 18

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)

<b>Test date</b>	2023-06-30	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-LA02-40W4FTBTA1-abc40		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230401	120.0	60	0.318	38.08	0.999	3.86
1E-B3	277.0	60	0.138	37.19	0.971	10.38
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

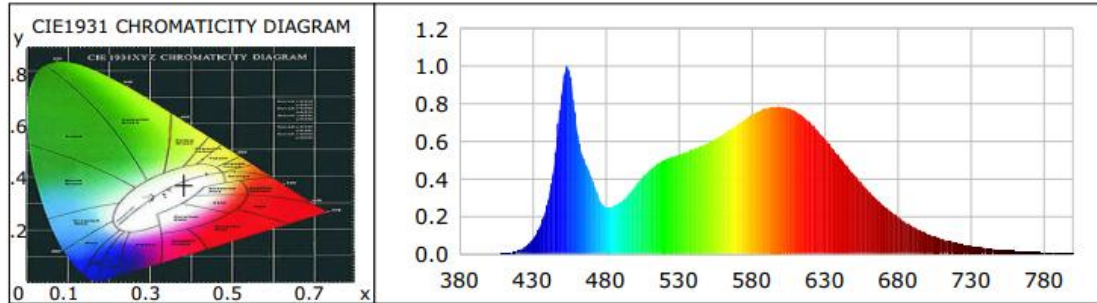
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	21
Frequency (Hz)	60	R2	93	R10	83
CCT (K)	3935	R3	96	R11	83
Duv	-0.0036	R4	84	R12	65
Chromaticity (x, y)	x=0.3807 y=0.3694	R5	85	R13	88
Chromaticity (u', v')	u(u')=0.2283 v'(v')=0.4983	R6	90	R14	99
Color Rendering Index (CRI)	86	R7	85	R15	80
R9	21	R8	67	--	--
Rf	85	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11				

**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)	5279.0	5146.4	Category1: >=375lm/ft(-10%) Category2: >=5000-10000(-10%)
Luminous Efficacy (lm/W)	138.63	138.38	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	135.15		



### Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0192	535	0.5140	66.4478	690	0.2585	33.4099
385	0.0002	0.0292	540	0.5277	68.2113	695	0.2253	29.1247
390	0.0005	0.0635	545	0.5412	69.9531	700	0.1955	25.2745
395	0.0006	0.0718	550	0.5558	71.8430	705	0.1692	21.8674
400	0.0007	0.0845	555	0.5699	73.6703	710	0.1474	19.0487
405	0.0010	0.1273	560	0.5887	76.1032	715	0.1257	16.2508
410	0.0021	0.2696	565	0.6104	78.9062	720	0.1078	13.9288
415	0.0069	0.8930	570	0.6344	82.0049	725	0.0919	11.8731
420	0.0172	2.2238	575	0.6612	85.4702	730	0.0781	10.0893
425	0.0372	4.8040	580	0.6864	88.7295	735	0.0665	8.5970
430	0.0752	9.7264	585	0.7147	92.3911	740	0.0570	7.3621
435	0.1440	18.6191	590	0.7410	95.7830	745	0.0492	6.3563
440	0.2623	33.9005	595	0.7604	98.2974	750	0.0419	5.4130
445	0.4821	62.3142	600	0.7748	100.1578	755	0.0345	4.4532
450	0.8456	109.3135	605	0.7844	101.3974	760	0.0294	3.8041
455	0.9807	126.7691	610	0.7851	101.4875	765	0.0270	3.4915
460	0.6926	89.5309	615	0.7766	100.3932	770	0.0232	3.0053
465	0.5040	65.1450	620	0.7598	98.2223	775	0.0197	2.5425
470	0.4167	53.8649	625	0.7339	94.8749	780	0.0168	2.1759
475	0.3071	39.6985	630	0.6991	90.3662	785	0.0138	1.7870
480	0.2511	32.4623	635	0.6587	85.1472	790	0.0121	1.5642
485	0.2530	32.7033	640	0.6138	79.3396	795	0.0089	1.1441
490	0.2733	35.3282	645	0.5641	72.9186	800	0.0073	0.9480
495	0.3086	39.8918	650	0.5168	66.8077			
500	0.3571	46.1567	655	0.4682	60.5185			
505	0.4048	52.3229	660	0.4221	54.5644			
510	0.4443	57.4391	665	0.3765	48.6638			
515	0.4732	61.1700	670	0.3351	43.3143			
520	0.4964	64.1624	675	0.2947	38.0960			
525	0.5140	66.4478	680	0.2585	33.4099			
530	0.5277	68.2113	685	0.2253	29.1247			

**TM30**

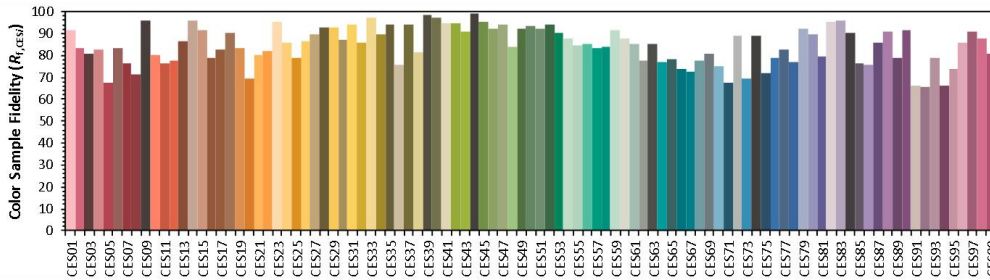
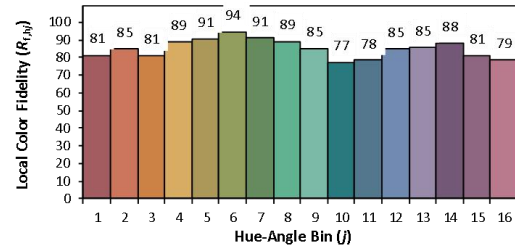
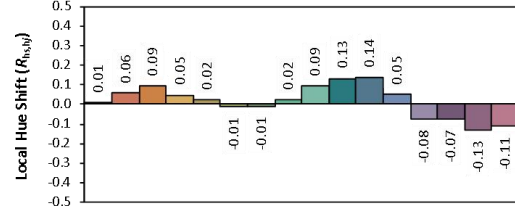
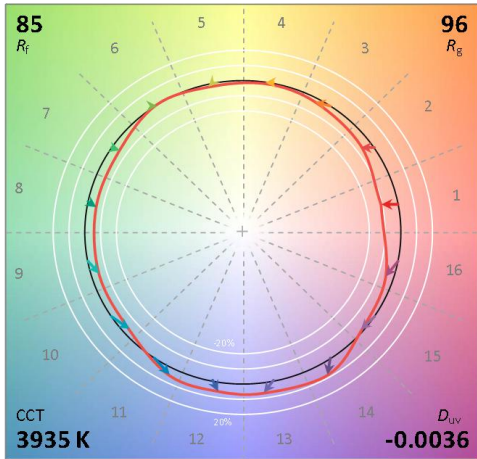
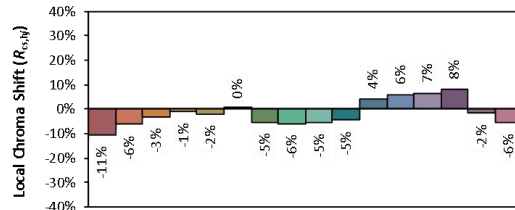
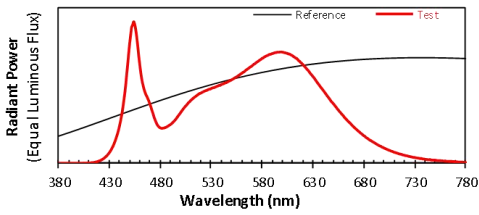
**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-3080RA35002U1  
L128-5080RA35002U1

Manufacturer: ASMART LIGHT CO., LTD

Date: 2023/6/30

Model: AST-LA02-40W4FTBTA1-abc40



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

$x$  0.3808  
 $y$  0.3694  
 $u'$  0.2283  
 $v'$  0.4983

CIE 13.3-1995 (CRI)  
 $R_a$  86  
 $R_9$  21

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

**2.4 Electrical, Photometric and Chromaticity Measurements**  
(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-06-30	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-LA02-40W4FTBTA1-abc50		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230401	120.0	60	0.330	39.51	0.999	3.73
1E-B4	277.0	60	0.144	38.59	0.970	10.32
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

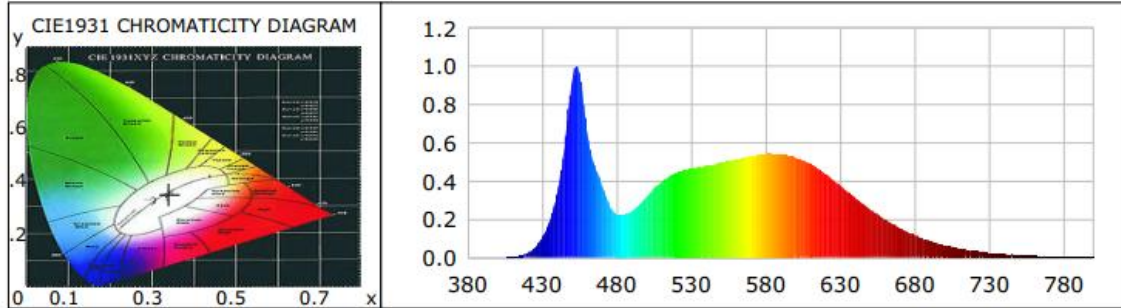
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	15
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	5171	R3	93	R11	83
Duv	-0.0003	R4	84	R12	62
Chromaticity (x, y)	x=0.3404 y=0.3472	R5	84	R13	86
Chromaticity (u', v')	u(u')=0.2100 v'(v')=0.4818	R6	85	R14	97
Color Rendering Index (CRI)	84	R7	87	R15	79
R9	15	R8	69	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
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)	5156.5	5041.8	Category1: >=375lm/ft(-10%) Category2: >=5000-10000(-10%)
Luminous Efficacy (lm/W)	130.51	130.65	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	127.61		



**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.0614	535	0.4556	73.6898	690	0.1535	24.8203
385	0.0003	0.0559	540	0.4645	75.1289	695	0.1344	21.7441
390	0.0005	0.0822	545	0.4726	76.4432	700	0.1170	18.9223
395	0.0003	0.0559	550	0.4806	77.7328	705	0.1012	16.3628
400	0.0010	0.1674	555	0.4861	78.6199	710	0.0875	14.1571
405	0.0014	0.2198	560	0.4946	79.9978	715	0.0754	12.1920
410	0.0037	0.6063	565	0.5040	81.5127	720	0.0645	10.4313
415	0.0099	1.6079	570	0.5131	82.9981	725	0.0548	8.8584
420	0.0238	3.8453	575	0.5220	84.4300	730	0.0475	7.6773
425	0.0502	8.1210	580	0.5300	85.7237	735	0.0404	6.5294
430	0.1014	16.4053	585	0.5375	86.9359	740	0.0353	5.7134
435	0.1907	30.8484	590	0.5424	87.7243	745	0.0301	4.8687
440	0.3344	54.0942	595	0.5423	87.7190	750	0.0251	4.0580
445	0.5791	93.6679	600	0.5415	87.5801	755	0.0210	3.3980
450	0.9151	148.0101	605	0.5344	86.4414	760	0.0183	2.9606
455	0.9672	156.4370	610	0.5245	84.8371	765	0.0176	2.8392
460	0.6720	108.6910	615	0.5080	82.1677	770	0.0127	2.0483
465	0.4836	78.2123	620	0.4889	79.0822	775	0.0124	2.0022
470	0.3799	61.4510	625	0.4657	75.3180	780	0.0112	1.8086
475	0.2766	44.7314	630	0.4371	70.7003	785	0.0082	1.3189
480	0.2264	36.6207	635	0.4068	65.8026	790	0.0068	1.0961
485	0.2242	36.2629	640	0.3762	60.8491	795	0.0058	0.9403
490	0.2412	39.0149	645	0.3438	55.6120	800	0.0049	0.8001
495	0.2736	44.2454	650	0.3127	50.5770			
500	0.3176	51.3704	655	0.2817	45.5620			
505	0.3604	58.3009	660	0.2517	40.7150			
510	0.3956	63.9906	665	0.2246	36.3307			
515	0.4218	68.2307	670	0.1998	32.3244			
520	0.4415	71.4166	675	0.1757	28.4214			
525	0.4556	73.6898	680	0.1535	24.8203			
530	0.4645	75.1289	685	0.1344	21.7441			

**TM30**

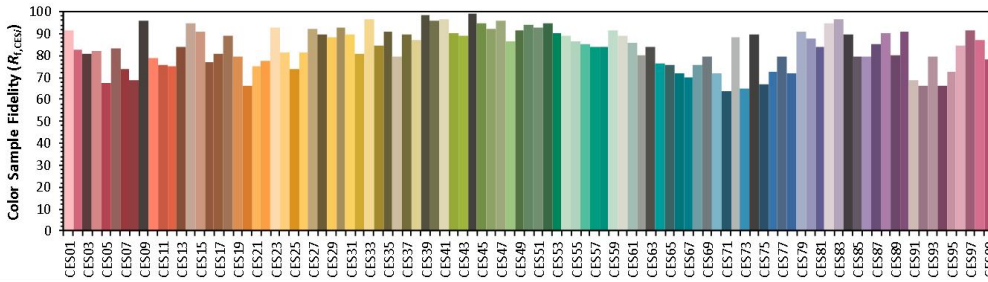
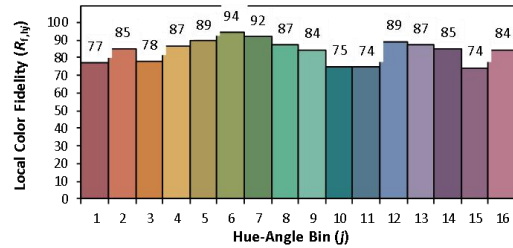
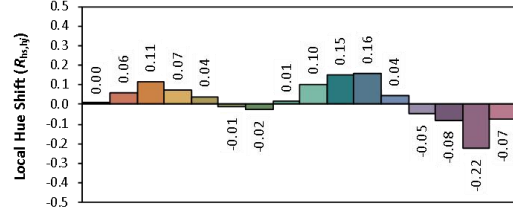
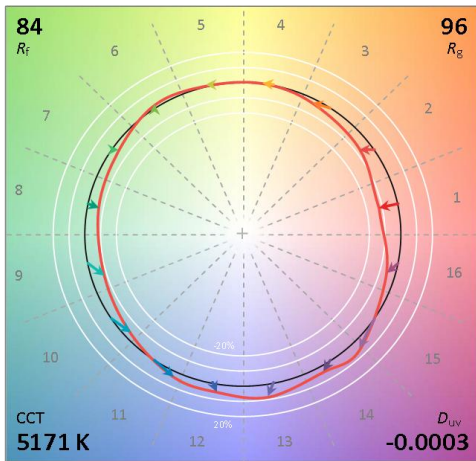
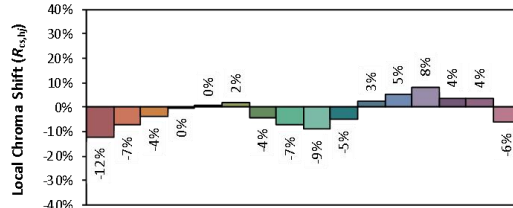
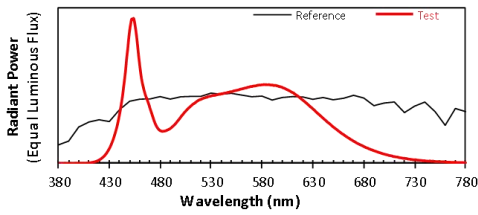
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RA35002U1

Manufacturer: ASHART LIGHT CO., LTD

Date: 2023/6/30

Model: AST-LA02-40W4FTBTA1-abc50



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

$x$  0.3404  
 $y$  0.3472  
 $u'$  0.2100  
 $v'$  0.4818

CIE 13.3-1995 (CRI)  
 $R_a$  84  
 $R_g$  15

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	2023-01-17
AC Power Source	CHP-500C	DYBWD010159	2023-01-18
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2023-02-01
Digital Power Meter	WT500	DYDWQ20010	2023-01-18
Integral Sphere (2M)	2M	DYJCE120067	2023-01-17
Digital Power Meter	WT500	DYDWQ200006	2023-01-18
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2023-01-17
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 \*\*\*\*\*