

## HERCULUX Chengdu HercuLux Photoelectric 恒坤光电 Toobacles C Technology Co.,Ltd

## **Product Approval**

#### Approval number:

#### Customer:

PN	Code	Product
HK-55@21-15-D9-20-1g-1	1. 01. 5498	55@21-15° Lens
HK-55@21-20-D9-20-1g-1	1. 01. 5495	55@21-20° Lens
HK-55@21-24-D9-20-1g-1	1. 01. 7990	55@21-24° Lens
HK-55@21-36-D9-20-1g-1	1. 01. 7991	55@21-36° Lens
HK-55@21-60-D9-20-1g-1	1. 01. 81457	55@21-60° Lens

Manufacturer: Chengdu HercuLux Photoelectric Technology Co.,Ltd



	Supplier co	onfirmation		Client cor	nfirmation	
Proposed		DATE	Qualified□		D.A.T.F.	
Project manager		DATE	Unqualified□		DATE	
Audit		DATE	Audit		DATE	
Approved		DATE	Approved		DATE	
Stamp		DATE	Stamp		DATE	

( Confirmation of acceptance by both parties must be signed and sealed )

Factory: Chengdu Shuangliu District, Iot industrial park 2 road HercuLux Photoelectric Park

Phone: 028-85887727 (801) 028-85887990 (801) Fax: 028-85887730 www.hkoptics.com Sales Dept: Shenzhen Nanshan District Nanshan Cloud Valley Innovation Industrial Park Comprehensive Service Building,

TEL: 0755-2937 1541 FAX: 0755-2907 5140

<sup>\*</sup>Approval In duplicate, for both supplier and customer.

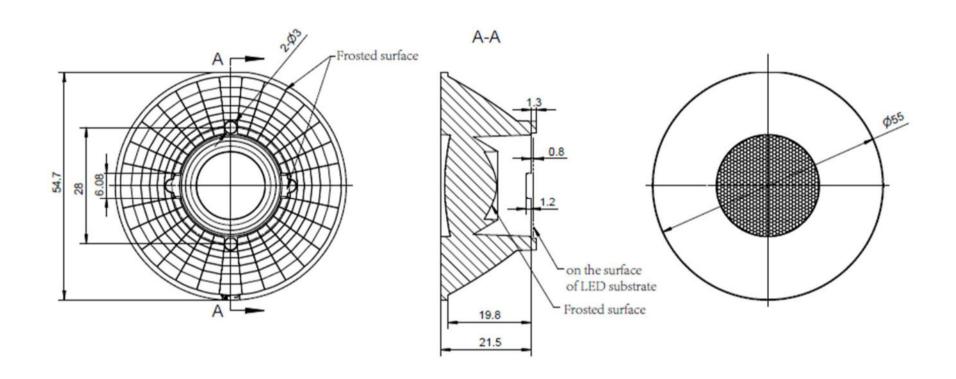


# HERCULUX 恒坤光电 Product Approval

TEL: 0755-2937 1541 Date updated: 2019/2/15 FAX: 0755-2907 5140 www.hkoptics.com

Product Picture:	
PN:	HK-55@21-15-D9-20-1g-1
Size(L*W*H/Φ*H):	Ф:55mm; H:21.5mm
1.07.81418_HK-166@03-0223-S	PMMA
Effiency:	\
Temperature(Topr):	-40°C to +80°C
FWHM:	15°/20°/24°/36°/60°
Matched LES:	D9



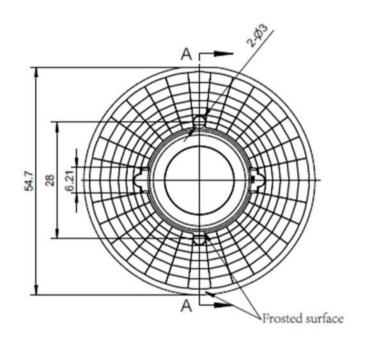


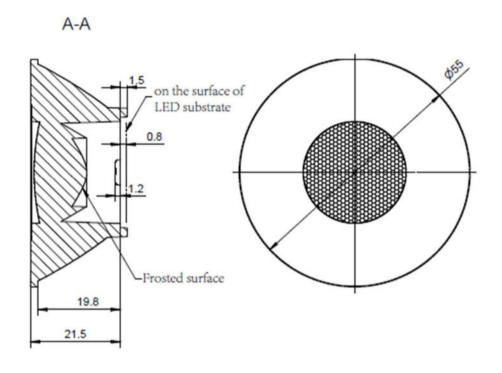
- 1. The 3D map is not indicated for rounded corners and draft angle.
- 2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
- 3, The surface has no flash, shrinkage, bubbles and other defects.

Optical design						HK-55@21-15-D9-20-1g-1						
tructure desig				55@21-15°Lens 1.01.5498								
Review						umber o	umber of drawin qty weight					
Validation				Material:	PMMA		CDHK					

MT5	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
olerance ole (mm)	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0





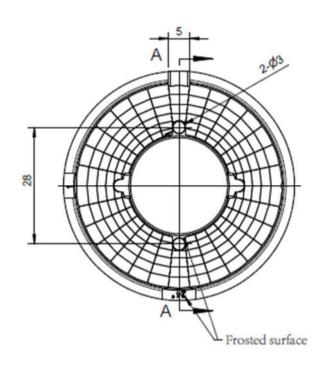


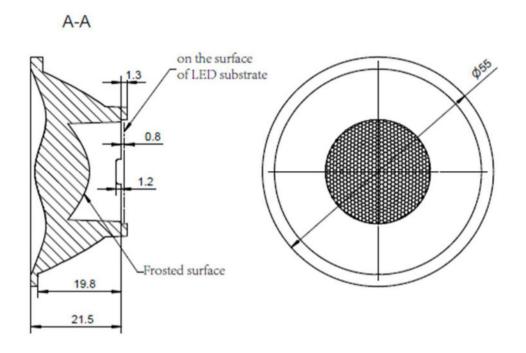
- 1. The 3D map is not indicated for rounded corners and draft angle.
- 2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
- 3, The surface has no flash, shrinkage, bubbles and other defects.

tructure desig 55@21-20°Le	ns		1 01 5/05		
	55@21-20°Lens 1.01.5495				i
Review	umber of drawin				
Validation Material: PI	MMA		CDHK		

MT5	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
olerance ole (mm)	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0





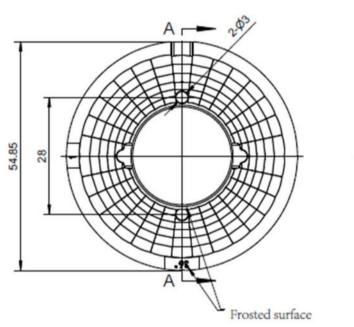


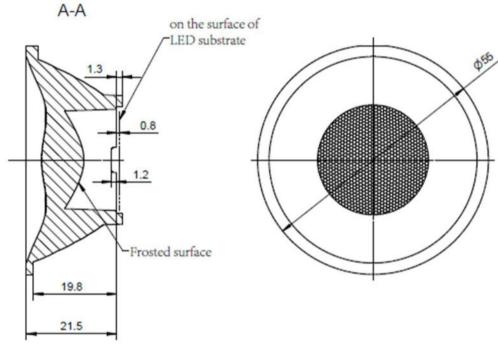
- 1. The 3D map is not indicated for rounded corners and draft angle.
- 2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
- 3, The surface has no flash, shrinkage, bubbles and other defects.

Optical design					HK-55@21-24-D9-20-1g-1						
tructure desig		55@	55@21-24°Lens 1.01.7990								
Review		1		umber of o	drawin	qty	we	ight			
Validation		Material:	PMMA		CDHK						

MT5	Basic size	<3	3~10	24~65	65~140	140~250	250~450	>450
Tolerance table (mm)	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	±2.0





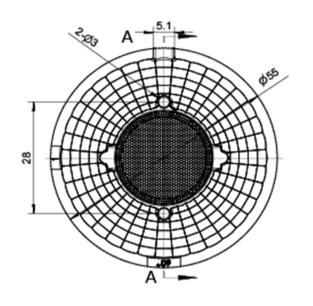


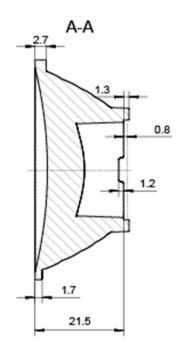
- 1. The 3D map is not indicated for rounded corners and draft angle.
- 2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
- 3, The surface has no flash, shrinkage, bubbles and other defects.

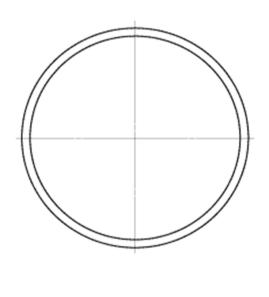
Optical design							HK-55@21-36-D9-20-1g-1						
tructure desig	1			55@									
Review						umber of drawin qty w							
Validation				Material:	PMMA	CDHK							

MT5 Tolerance	Basic size	<3	3∼10	24~65	65~140	140~250	250~	450 >	450				
	olerance valu	±0.1	±0.15	±0.35	±0.50	±0.80	±1.2	2 ±	2.0				







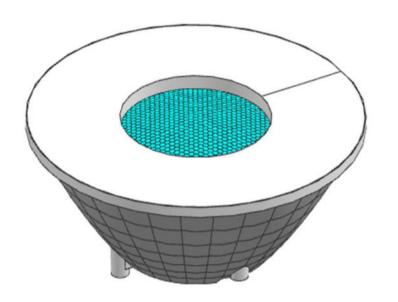


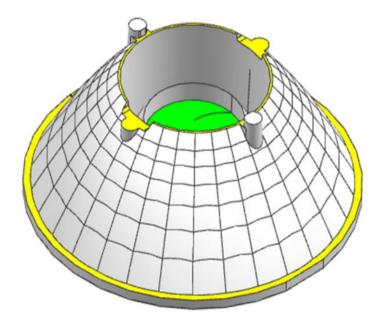
- 1. The 3D map is not indicated for rounded corners and draft angle.
- 2. The dimensional tolerances are not specified according to GB/T 14486 2008 MT5.
- 3, The surface has no flash, shrinkage, bubbles and other defects.

C	Optical	design								HK-55@21-60-D9-20-1g-1						
structure desig							55@21-60°Lens 1.01.81457									
Ī	Revi	eview							umber o	f drawin	qty	we	ight			
	Validation					Material:	PMMA		CDHK							

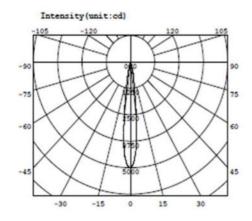
MT5	Basic size	< 3	3∼10	24~65	65~140	140~250	250~	~450	>450	
Tolerance	Dusic size	,	3 10	2+ 05	05 140	140 250	250	430	/ 430	
	oloranco valu	±0.1	±0.15	±0.35	±0.50	±0.80	⊥1	2	±2.0	
table (mm)	olerance valu	±0.1	±0.15	±0.55	±0.50	±0.60	±1.	.2	±2.0	

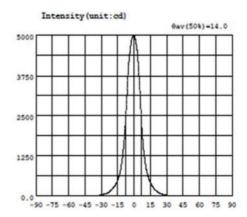












Intensity data: (deg , cd) C0-180

λ	I	λ	I	A	I	λ	I	λ	I	λ	I
-90.0	0.2486	-58.5	5.060	-27.0	59.30	4.5	3827	36.0	12.07	67.5	3.225
-88.5	0.3165	-57.0	5.519	-25.5	78.16	6.0	2873	37.5	11.60	69.0	2.978
-87.0	0.4074	-55.5	6.024	-24.0	103.3	7.5	1994	39.0	10.57	70.5	2.697
-85.5	0.6006	-54.0	6.551	-22.5	127.6	9.0	1378	40.5	9.802	72.0	2.464
-84.0	0.7251	-52.5	7.099	-21.0	181.9	10.5	982.8	42.0	9.194	73.5	2.226
-82.5	1.008	-51.0	7.343	-19.5	236.5	12.0	721.2	43.5	8.684	75.0	2.011
-81.0	1.269	-49.5	7.608	-18.0	302.5	13.5	549.3	45.0	8.298	76.5	1.786
-79.5	1.450	-48.0	7.907	-16.5	385.3	15.0	427.8	46.5	8.205	78.0	1.571
-78.0	1.663	-46.5	8.133	-15.0	493.9	16.5	325.6	48.0	7.971	79.5	1.266
-76.5	1.879	-45.0	8.468	-13.5	644.5	18.0	248.8	49.5	7.476	81.0	1.215
-75.0	2.084	-43.5	8.925	-12.0	870.6	19.5	187.8	51.0	7.167	82.5	0.9094
-73.5	2.309	-42.0	9.511	-10.5	1222	21.0	140.8	52.5	6.750	84.0	0.6950
-72.0	2.536	-40.5	10.26	-9.0	1775	22.5	105.8	54.0	6.245	85.5	0.5265
-70.5	2.766	-39.0	11.25	-7.5	2529	24.0	80.20	55.5	5.732	87.0	0.3854
-69.0	3.050	-37.5	12.64	-6.0	3515	25.5	60.67	57.0	5.317	88.5	0.2860
-67.5	3.310	-26.0	14.59	-4.5	4239	27.0	46.05	58.5	4.972	90.0	0.2712
-66.0	3.591	-34.5	17.27	-3.0	4691	28.5	35.16	60.0	4.660		
-64.5	3.886	-33.0	20.89	-1.5	4944	30.0	27.16	61.5	4.377		
-63.0	4.152	-31.5	26.38	0.0	4992	31.5	21.75	63.0	4.077		
-61.5	4.440	-30.0	34.27	1.5	4831	33.0	17.88	64.5	3.796		1
-60.0	4.753	-28.5	45.04	3.0	4466	34.5	15.09	66.0	3.504		

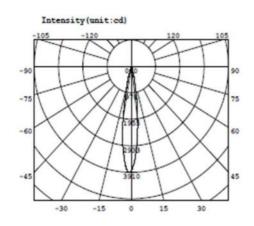
## Electricity Parameter:

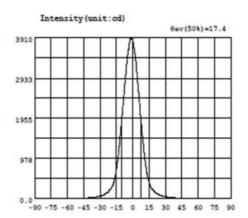
Current I: 0.1000A Power: 3.470W Voltage V: 34.70V PF: 1.000

## Optical Parameter (Distance=2.410m):

C0-180Plane IO= 4992cd







Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	λ	I	A	I	A	I
-90.0	0.2930	-58.5	7.858	-27.0	89.32	4.5	2850	36.0	25.03	67.5	4.451
-88.5	0.4714	-57.0	8.356	-25.5	109.9	6.0	2403	37.5	22.07	69.0	4.117
-87.0	0.6004	-55.5	8.871	-24.0	135.6	7.5	1944	39.0	19.64	70.5	3.790
-85.5	0.8807	-54.0	9.463	-22.5	167.8	9.0	1504	40.5	17.56	72.0	3.448
-84.0	1.112	-52.5	10.08	-21.0	209.3	10.5	1107	42.0	15.87	73.5	3.090
-82.5	1.455	-51.0	10.79	-19.5	266.9	12.0	783.8	43.5	14.41	75.0	2.758
-81.0	1.774	-49.5	11.54	-18.0	353.1	13.5	552.9	45.0	13.18	76.5	2.462
-79.5	2.095	-48.0	12.29	-16.5	487.7	15.0	402.4	46.5	12.26	78.0	2.154
-78.0	2.492	-46.5	13.31	-15.0	703.8	16.5	294.3	48.0	11.44	79.5	1.833
-76.5	2.953	-45.0	14.56	-13.5	1003	18.0	228.4	49.5	10.57	81.0	1.555
-75.0	3.410	-43.5	16.14	-12.0	1371	19.5	181.0	51.0	9.859	82.5	1.238
-73.5	2.795	-42.0	18.05	-10.5	1800	21.0	146.7	52.5	9.111	84.0	1.001
-72.0	4.177	-40.5	20.46	-9.0	2269	22.5	119.0	54.0	8.451	85.5	0.8117
-70.5	4.583	-39.0	23.26	-7.5	2724	24.0	96.94	55.5	7.822	87.0	0.7403
-69.0	4.941	-37.5	26.69	-6.0	3166	25.5	78.87	57.0	7.260	88.5	0.6866
-67.5	5.313	-26.0	30.85	-4.5	3523	27.0	65.00	58.5	6.796	90.0	0.6254
-66.0	5.685	-34.5	36.00	-3.0	2793	28.5	53.89	60.0	6.346		
-64.5	6.083	-22.0	42.29	-1.5	2908	30.0	45.37	61.5	5.944		
-63.0	6.477	-31.5	50.08	0.0	3835	31.5	38.58	63.0	5.574		
-61.5	6.913	-30.0	59.96	1.5	3620	33.0	33.06	64.5	5.187		
-60.0	7.382	-28.5	73.03	2.0	3282	34.5	28.63	66.0	4.802		

## Electricity Parameter:

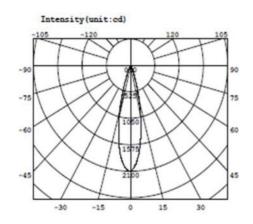
Current I: 0.1000A Power: 3.470W Voltage V: 34.70V PF: 1.000

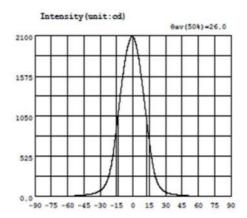
#### Optical Parameter (Distance=2.559m):

Equivalent Luminous flux: #eff = \$10.61m Efficiency: Eff=147.161m/W

C0-180Plane I0= 3835cd







Intensity data: (deg , cd) C0-180

A	I	A	I	A	I	λ	I	λ	I	A	I
-90.0	0.3694	-58.5	8.654	-27.0	121.5	4.5	1874	36.0	31.42	67.5	5.204
-88.5	0.5485	-57.0	9.262	-25.5	153.6	6.0	1741	27.5	27.43	69.0	4.627
-87.0	0.8546	-55.5	9.916	-24.0	196.1	7.5	1587	39.0	24.05	70.5	4.215
-85.5	1.148	-54.0	10.66	-22.5	254.1	9.0	1421	40.5	21.34	72.0	3.804
-84.0	1.353	-52.5	11.57	-21.0	332.8	10.5	1244	42.0	19.06	73.5	3.374
-82.5	1.633	-51.0	12.53	-19.5	438.9	12.0	1067	43.5	17.14	75.0	3.053
-81.0	1.940	-49.5	13.69	-18.0	578.8	12.5	892.5	45.0	15.53	76.5	2.674
-79.5	2.284	-48.0	15.11	-16.5	749.8	15.0	731.0	46.5	14.11	78.0	2.377
-78.0	2.640	-46.5	16.68	-15.0	919.7	16.5	574.8	48.0	12.94	79.5	2.011
-76.5	2.964	-45.0	18.48	-12.5	1094	18.0	440.1	49.5	11.83	81.0	1.677
-75.0	3.308	-43.5	20.62	-12.0	1274	19.5	319.2	51.0	10.97	82.5	1.426
-73.5	3.749	-42.0	23.11	-10.5	1448	21.0	240.5	52.5	10.19	84.0	1.253
-72.0	4.265	-40.5	26.34	-9.0	1612	22.5	182.8	54.0	9.530	85.5	0.9391
-70.5	4.692	-29.0	20.25	-7.5	1758	24.0	140.5	55.5	8.854	87.0	0.6696
-69.0	5.251	-37.5	34.80	-6.0	1880	25.5	109.6	57.0	8.249	88.5	0.5350
-67.5	5.879	-36.0	40.14	-4.5	1975	27.0	87.32	58.5	7.876	90.0	0.4828
-66.0	6.409	-34.5	46.81	-3.0	2044	28.5	71.03	60.0	7.474		
-64.5	6.898	-33.0	55.28	-1.5	2086	30.0	58.94	61.5	7.052		
-63.0	7.291	-31.5	65.76	0.0	2089	31.5	49.46	63.0	6.663		
-61.5	7.725	-30.0	79.33	1.5	2050	33.0	42.09	64.5	6.208		
-60.0	8.156	-28.5	97.49	3.0	1976	34.5	36.10	66.0	5.792		

#### Electricity Parameter:

Current I: 0.1000A Power: 3.470W Voltage V: 34.70V PF: 1.000

## Optical Parameter (Distance=2.559m):

Equivalent Luminous flux: #eff = 516.71m Efficiency: Eff=148.921m/W

Diffuse angle: @(25%): 35.5deg@(50%): 26.0deg@(75%): 16.9deg@(50%): 26.0deg

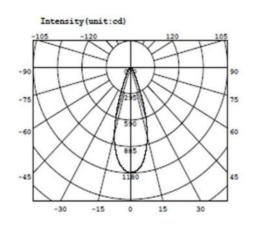
Diffuse angle: @(25%): 35.5deg@(50%): 26.0deg@(75%): 17.0deg@(50%): 26.0deg

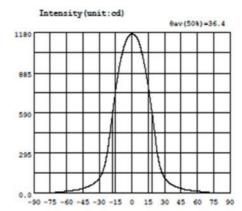
Imax=2093cd (C=0.0deg,G=-0.5deg)

CO-180Plane Imax= 2093cd(G=-0.5deg)

C0-180Plane I0= 2089cd







Intensity data: (deg , cd) C0-180

λ	I	A	I	A	I	λ	I	A	I	Α	I
-90.0	1.312	-58.5	15.66	-27.0	155.9	4.5	1146	36.0	67.55	67.5	7.935
-88.5	1.682	-57.0	17.18	-25.5	191.6	6.0	1121	37.5	60.03	69.0	6.844
-87.0	1.964	-55.5	18.88	-24.0	239.3	7.5	1087	39.0	53.55	70.5	6.151
-85.5	2.463	-54.0	20.64	-22.5	204.8	9.0	1041	40.5	48.18	72.0	5.802
-84.0	3.191	-52.5	22.59	-21.0	388.1	10.5	985.5	42.0	43.97	73.5	5.629
-82.5	2.917	-51.0	24.51	-19.5	480.1	12.0	925.6	43.5	39.01	75.0	5.508
-81.0	4.259	-49.5	26.57	-18.0	574.0	13.5	860.9	45.0	35.03	76.5	5.403
-79.5	4.488	-48.0	28.88	-16.5	666.9	15.0	787.7	46.5	31.72	78.0	5.458
-78.0	4.849	-46.5	21.55	-15.0	755.1	16.5	706.8	48.0	28.94	79.5	5.183
-76.5	5.163	-45.0	34.63	-13.5	835.6	18.0	621.3	49.5	26.69	81.0	5.082
-75.0	5.391	-43.5	38.14	-12.0	908.8	19.5	521.9	51.0	24.69	82.5	4.986
-73.5	5.482	-42.0	42.68	-10.5	971.6	21.0	440.6	52.5	22.71	84.0	4.187
-72.0	5.719	-40.5	47.95	-9.0	1026	22.5	343.0	54.0	20.76	85.5	3.326
-70.5	6.055	-29.0	52.11	-7.5	1071	24.0	266.7	55.5	19.01	87.0	2.526
-69.0	6.635	-37.5	58.22	-6.0	1107	25.5	207.4	57.0	17.36	88.5	2.010
-67.5	7.508	-36.0	65.43	-4.5	1136	27.0	165.7	58.5	15.84	90.0	1.752
-66.0	8.665	-34.5	73.74	-3.0	1158	28.5	136.6	60.0	14.43		
-64.5	10.10	-33.0	83.59	-1.5	1168	30.0	115.4	61.5	13.02		
-63.0	11.58	-31.5	95.55	0.0	1172	31.5	99.41	63.0	11.70		1
-61.5	12.73	-30.0	110.4	1.5	1168	33.0	86.73	64.5	10.62		
-60.0	14.13	-28.5	130.0	3.0	1162	34.5	76.22	66.0	9.229		

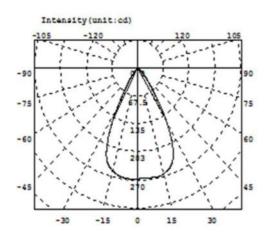
#### Electricity Parameter:

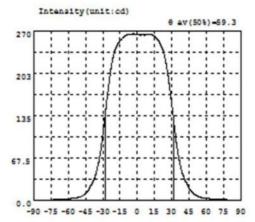
Current I: 0.1000A Power: 3.450W Voltage V: 34.50V PF: 1.000

## Optical Parameter (Distance=2.559m):

C0-180Plane I0= 1172cd







Intensity data: (deg , cd) C0-180

λ	I	λ	I	λ	I	λ	1	λ	I	A	I
-90.0	0.5096	-58.5	3.188	-27.0	152.8	4.5	263.5	36.0	67.57	67.5	2.698
-88.5	0.4845	-57.0	3.479	-25.5	175.5	6.0	263.4	37.5	54.59	69.0	2.591
-87.0	0.5352	-55.5	3.830	-24.0	196.4	7.5	263.7	39.0	44.06	70.5	2.430
-85.5	0.5738	-54.0	4.301	-22.5	214.7	9.0	264.3	40.5	35.64	72.0	2.300
-84.0	0.6501	-52.5	4.866	-21.0	228.7	10.5	264.5	42.0	30.15	73.5	2.151
-82.5	0.6898	-51.0	5.461	-19.5	238.5	12.0	264.2	43.5	25.05	75.0	1.947
-81.0	0.7406	-49.5	6.207	-18.0	245.3	13.5	263.1	45.0	19.51	76.5	1.777
-79.5	0.8066	-48.0	7.429	-16.5	250.4	15.0	260.8	46.5	15.38	78.0	1.621
-78.0	0.9967	-46.5	9.098	-15.0	254.4	16.5	258.0	48.0	12.49	79.5	1.457
-76.5	1.174	-45.0	11.24	-13.5	257.5	18.0	254.8	49.5	10.24	81.0	1.261
-75.0	1.365	-43.5	14.19	-12.0	260.1	19.5	250.6	51.0	8.428	82.5	1.197
-73.5	1.563	-42.0	18.70	-10.5	262.3	21.0	244.6	52.5	6.975	84.0	1.144
-72.0	1.827	-40.5	24.13	-9.0	263.7	22.5	237.0	54.0	5.928	85.5	1.130
-70.5	2.003	-39.0	28.31	-7.5	264.3	24.0	225.9	55.5	5.173	87.0	1.096
-69.0	2.097	-37.5	34.80	-6.0	265.1	25.5	211.2	57.0	4.550	88.5	1.021
-67.5	2.235	-36.0	43.41	-4.5	265.0	27.0	193.4	58.5	4.099	90.0	1.007
-66.0	2.359	-34.5	54.07	-3.0	265.1	28.5	172.9	60.0	3.754		
-64.5	2.490	-33.0	67.43	-1.5	265.0	30.0	150.4	61.5	3.435		
-63.0	2.642	-31.5	83.90	0.0	264.5	31.5	126.7	63.0	3.205	Ĭ	
-61.5	2.780	-30.0	105.0	1.5	263.6	33.0	103.5	64.5	3.030		
-60.0	2.956	-28.5	129.2	3.0	263.4	34.5	83.49	66.0	2.856		

## Electricity Parameter:

Current I: 0.1000A Power: 1.650W Voltage V: 16.50V PF: 1.000

#### Optical Parameter (Distance=2.559m):

Diffuse angle: @(25%): 69.2deg@(50%): 59.3deg@(75%): 50.3deg@(50%): 59.3deg
Diffuse angle: @(25%): 69.2deg@(50%): 59.4deg@(75%): 50.3deg@(50%): 59.4deg
Imax=265.2cd (C=0.0deg,G=-3.5deg)
CO-180Plane Imax= 265.2cd(G=-3.5deg)

CO-180Plane IO= 264.5cd



			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	diamet	er	55			54. 96	55. 04	55. 01	55. 01		
	heigh	t	21. 5			21.68	21. 67	21.64	21. 67		Test environment: In 20 °C -25 °C
1.Size	height		19.8			19.85	19. 9	19. 85	19. 86		environment to achieve thermal equilibrium after the
	Registra mast		3			2. 97	2. 95	2. 96	2. 97		test.
	Locati		28			28. 09	28. 1	27. 98	28. 07		
							ne appearar				
				See	attacnmen	t "Appearar	ice Inspecti	on Standard	as"		
2.Appear	rance		See achment pearance	E	1	No burr	No burr	No burr	No bu	rr	OK
Quality		Ins	spection andards"		N	o stains	No stains	No stains	No stai	ns	
3.Materia	al			PMM	۸ '		Color	Tra	nsparent		OK
	Testing I	_ED					D9				
4.Optica	to the so	ource actua	of the test,	if it is requ	ired to be o	out of range ent, the lens	. According	to the heat fully tested	dissipatio	n capa	uld be comparable ability of the lamp event the lens life.
I index	angle	9				14. 2	14	14	14		
	K-val	ue				10. 53	10.65	10. 59	10. 74		
	Efficie	ncy				93. 21%	93. 73%	93. 31%	93. 19%		
	Facula	See t	the signatu	re sample		,					
	ehensive ment					•	Qı	ualified			
Caliper 2 Height G Microsco Thick Ga Gauge E 2、Amb the size o	Number: V D-Quadra auge M-To pe P-Need uge R-Rad	tic H- pol dle T- dius erature uct re	e on	Length change ( mm	s 0.8 —	A produc	t size chan	ges with t	*	Siz Siz Siz Siz Siz	ze: 50mm ze: 100mm ze: 150mm ze: 200mm ze: 250mm ze: 300mm

- 1. Wear clean gloves during lens assembly to prevent contamination of the lens surface.
- Take the lens try to avoid touching the total reflection surface.
   When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.



			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	diamet	er	55			54. 99	54. 97	54. 92	54. 98		
	heigh	t	21. 5			21.39	21.34	21. 34	21. 34		Test environment: In 20 ℃ -25 ℃
1.Size	height	:2	19.8			19. 56	19. 6	19. 56	19. 56		environment to achieve thermal equilibrium after the
	Registra mast	tion	3			2. 97	2. 95	2. 96	2. 97		test.
	Locati colum		28			27. 84	27. 89	27. 89	27. 89		
							ne appearar		-		
				See	attachment	t "Appearar	nce Inspecti	on Standar	ds"		
2.Appear	rance		See achment pearance	E	1	No burr	No burr	No burr	No bu	rr	OK
Quality		Ins	spection andards"	_	N	o stains	No stains	No stains	No sta	ns	OK .
3.Materia	al			PMM	4		Color	Tra	nsparent		OK
	Testing I	_ED					D9			J	
4.Optica	to the so	ource actua	of the test,	if it is requ	ired to be o	out of range ent, the lens	. According	to the heat fully tested	dissipatio	n capa	uld be comparable ability of the lamp event the lens life.
I index	angle	)				17. 4	17. 7	17. 9	17. 9		
	K-val	ue				7. 65	7. 51	7. 30	7. 31		
	Efficie	ncy				90. 56%	90.63%	90. 19%	90. 56%		
	Facula	See t	the signatu	re sample		`					
	ehensive ment					_	Qı	ıalified			
Caliper 2 Height G Microsco Thick Ga Gauge E 2、Amb the size o	Number: V D-Quadra auge M-To pe P-Need auge R-Rad	tic H- pol dle T- dius erature uct re	e on	Length change ( mm	s 0.8 —	10	t size chan	ges with t	*	Siz Siz Siz Siz Siz	ze: 50mm ze: 100mm ze: 150mm ze: 200mm ze: 250mm ze: 300mm

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			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	diamet	er	55			54. 99	54. 97	54. 92	54. 98		
	heigh	t	21. 5			21. 49	21. 47	21. 52	21. 53		Test environment: In 20 °C -25 °C
1.Size	height		19.8			19. 56	19. 75	19. 72	19. 81		environment to achieve thermal equilibrium after the
	Registra mast		3			2. 97	2. 95	2. 96	2. 97		test.
	Locati		28			27. 84	27. 89	27. 89	27. 89		
							ne appearar				
				See	attacnmen	t "Appearar	nce Inspecti	on Standard	as"		
2.Appear	rance		See achment pearance	E	1	No burr	No burr	No burr	No bu	rr	OK
Quality		Ins	spection andards"		N	o stains	No stains	No stains	No stai	ins	
3.Materia	al			PMM	۸ '		Color	Tra	nsparent		OK
	Testing I	ED					D9	•			
4.Optica	to the so	ource actua	of the test,	if it is requ	ired to be o	out of range ent, the lens	. According	to the heat fully tested	dissipatio	n capa	uld be comparable ability of the lamp event the lens life.
I index	angle	9				26. 6	25. 9	26. 4	25. 6		
	K-val	ue				3. 91	4. 13	3. 97	4. 12		
	Efficie	ncy				92. 03%	92. 51%	92. 10%	92. 39%		
	Facula	See t	the signatu	re sample		`					
	ehensive ment					•	Qı	ualified			
Caliper 2 Height G Microsco Thick Ga Gauge E 2、Amb the size o	Number: V D-Quadra auge M-To pe P-Need auge R-Rad	tic H- pol dle T- dius erature	e on	Length change ( mm	es 0.8 —	AA produc	t size chan	ges with t	*	Siz Siz Siz Siz Siz	ze: 50mm ze: 100mm ze: 150mm ze: 200mm ze: 250mm ze: 300mm

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			Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	diamet	er	55			55. 08	55. 09	55. 14	55. 1		
	heigh	t	21.5			21.54	21. 45	21. 59	21. 57		Test environment: In 20 °C -25 °C
1.Size	height	:2	19.8			19. 76	19. 7	19.82	19. 78		environment to achieve thermal equilibrium after the
	Registra mast	tion	3			2.93	2. 93	2. 94	2. 93		test.
	Locati colum		28			28	27. 99	27. 99	27. 96		
							ne appearar				
				See	attachment I	: "Appearar	ice Inspecti	on Standar	ds"		
2.Appear	rance		See achment bearance	E	١	No burr	No burr	No burr	No bu	rr	ОК
Quality		Ins	spection andards"	1	N	o stains	No stains	No stains	No stai	ns	OIX
3.Materia	al			PMMA	4		Color	Tra	nsparent		OK
	Testing I	_ED					D9				•
4.Optica	to the so	ource actual	of the test,	if it is requ	ired to be c	out of range nt, the lens	. According	to the heat fully tested	dissipatio	n capa	uld be comparable ability of the lamp event the lens life.
I index	angle	)				35	36. 2	36. 4	34. 5		
	K-val	ue				2.35	2. 25	2. 22	2. 40		
	Efficie	ncy				91. 33%	92. 78%	91. 36%	91. 04%		
	Facula	See t	he signatui	re sample		,	•			•	
	ehensive ment						Qı	ualified			
Caliper 2 Height G Microsco Thick Ga Gauge E 2、Amb the size o	Number: V D-Quadra auge M-To pe P-Need luge R-Rad	tic H- pol dle T- dius erature uct re	e on	Length change (mm)	s 0.8 —	1A produc	t size chan	ges with t		Siz Siz Siz Siz Siz	ze: 50mm ze: 100mm ze: 150mm ze: 200mm ze: 250mm ze: 300mm

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diamete	Stan siz		Upper							
diamete		Z.E	Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Jud gme nt	Remarks
	er 5	5			55.03	55.07	54.98	55.03		
heigh	21	. 5			21.51	21.49	21.46	21.51		Test environment: In 20 °C -25 °C
height	2 19	. 8			1.66	1.69	1.63	1.64		environment to achieve thermal equilibrium after the
Registra mast	tion 3	3			3.01	3.05	2.99	2.96		test.
	9	8			28.02	28.05	27.95	27.96		
			Gate	shear can i	not affect th	ne appearar	nce of the la	ımp		
			See a	attachment	"Appearar	ice Inspecti	on Standard	ds"		
ance			_	1	No burr	No burr	No burr	No bu	rr	OK
	Inspecti	on	_	N	o stains	No stains	No stains	No stai	ns	OK .
			PMMA	4		Color	Tra	nsparent		OK
Testing L	.ED					D9				
to the so	urce of the	e test,	if it is requ	ired to be o	out of range nt, the lens	. According should be	to the heat fully tested	dissipatio	n capa	ability of the lamp
	_	_				1		50.2	_	
	_	_			51.1	59. 1	39.0	39. 2	_	
	_	_			80 05%	90 19%	89 64%	90.00%	_	
		natur	e sample		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	30. 13/0	03.04%	J0. 00%		
	000 1110 31	griatui	c sample							
nent						Qı	ıalified			
D-Quadrat luge M-To be P-Need	ic H- ool Ile T-		change	s 0.8 —	1A produc	t size chan	ges with t		Siz	ze: 50mm ze: 100mm ze: 150mm ze: 200mm
	height Registrat mast Locatio column  Testing L The recor to the so and the a FWHN angle K-valu Efficier Facula hensive hent  Lumber: V D-Quadrat uge M-To be P-Need	height2 19  Registration mast  Location column 2  Registration gast See attachme "Appeara Inspecti Standard Sta	height2 19.8  Registration mast 28  Location column 28  See attachment "Appearance Inspection Standards"  Testing LED  The recommended size a to the source of the test, and the actual conditions  FWHM angle K-value  Efficiency  Facula See the signature nensive nent  Depended T-	Registration mast  Location column  See attachment "Appearance Inspection Standards"  Testing LED  The recommended size and power rest to the source of the test, if it is request and the actual conditions of the use FWHM  angle K-value  Efficiency  Facula See the signature sample mensive ment  Length change (mm)  our production of the use of the signature sample mensive ment  Length change (mm)  our production of the use of the signature sample mensive ment  Length change (mm)	Registration mast Location column  See attachment "Appearance Inspection Standards"  The recommended size and power rating of the to the source of the test, if it is required to be conditions of the use environment  FWHM  angle  K-value  Efficiency  Facula See the signature sample  mensive ment  PMM  Length changes 0.8 (mm) 0.7 0.6 0.5 0.4	height 2 19.8 1.66  Registration asst 28.02  Gate shear can not affect the See attachment "Appearance Inspection Standards"  Testing LED  The recommended size and power rating of the LED light to the source of the test, if it is required to be out of range and the actual conditions of the use environment, the lens FWHM See light angle K-value  Efficiency 89.95%  Facula See the signature sample  Tensive ment  PMMA productions of the use environment in the lens of the	height2 19.8 1.66 1.69  Registration as 3.01 3.05  Location column 28 28.02 28.05  Gate shear can not affect the appearar See attachment "Appearance Inspection Inspection Standards" No burr No burr No burr No stains	height 2 19.8 1.66 1.69 1.63  Registration mast 3 3.01 3.05 2.99  Coate shear can not affect the appearance of the late of the specific standards and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested for the source of the test, if it is required to be out of range. According to the heat and the actual conditions of the use environment, the lens should be fully tested.  Facula See the signature sample  PMMA product size changes with the changes of the conditions of the use of th	height 2 19.8 1.66 1.69 1.63 1.64  Registration 3 3.01 3.05 2.99 2.96  Location column 28 28.02 28.05 27.95 27.96  Gate shear can not affect the appearance of the lamp  See attachment "Appearance Inspection Standards"  No burr No burr No burr No burr No burr No burr No stains	height 2 19.8 1.66 1.69 1.63 1.64  Registration 3 3.01 3.05 2.99 2.96  Location column 28 28.02 28.02 28.05 27.95 27.96  Gate shear can not affect the appearance of the lamp  See attachment "Appearance Inspection Standards"  No burr No burr No burr No burr No burr No burr Standards"  PMMA Color Transparent  Testing LED D9  The recommended size and power rating of the LED light source recommended for this lens shout to the source of the test, if it is required to be out of range. According to the heat dissipation cap and the actual conditions of the use environment, the lens should be fully tested and tested to proper the set of the source of the set of the set of the source of the set of the set of the source of the set of the

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PI	N	HK-55@21-15-D9-20-	1g-1	Product Name	55@21-1	5°Lens	
Product	material	РММА		Customer			
Package	diagram	Single Vac	cuum packa	ge Bo	x package		~
Product	packing	10	A/ Box	4	Box/Layer		
	3	12	Layer/Box	480	A/ Carton		
	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0081	Blister box	23cm*21cm	48	BAG	
Deelseein	2	2.08.0001	PE film	30cm*30cm	48	PCS	
Packagin g	3	2.06.0005	Reel label paper	6.2cm*8cm	48	PCS	
Materials	4	2.06.0005	Box label paper	6.2cm*9.2cm	1	PCS	
	5	2.06.0003	big plate	46.8cm*42.8cm	13	PCS	
	6	2.06.0011	big carton	48cm*44cm*37cr	n 1	PCS	
Remarks		The loose packing is not subjec	t to this specif	ication. Customer's	requirements shall	prevail	



#### Special notice

When gule pass through holes, columns and other structures, or part of the thin structure, will form a weld line. The product which uses multi-point injection welding line will appear because of the combination of sol, as shown below:

Glue diagram

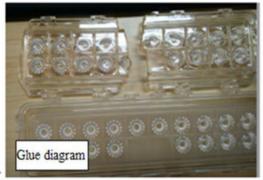
Glue direction

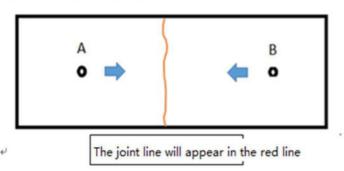
The joint line will appear in the red line

Hole position

#### Syntneti







#### Please note:

The appearance of lines in the structure of the product as well as at the screw hole is a normal phenomenon, will not affect the actual use of the product, and can not be avoided at this stage.



#### Appearance inspection standards

#### 1 Operating procedures

1.1.1Sampling standards, sampling plan and AQL

Test level : GB/T2828.1-2012The first part is according to the acceptance quality limit (AQL) retrieval batch inspection sampling plan, general inspection level  $\Pi$  level, CR class defect coefficient 0, MA defect rejection level AQL = 0.65, MI class defect rejection level AQL = 1.0; defect level please see 5.4.

2 Code table

Code	Code	Unit	Code	Code	Unit
	description			description	
N	Amount/pcs	pcs	D	Diameter	mm
L	Length	mm	Ħ	Depth	mm
W	Width	mm	DS	Distance	mm
S	Proportion	mm²	SS	Offset	mm

#### 3 Test conditions

- 3.1 Sight distance and working hours: Sight distance should be 30-35cm, each side of the inspection time does not exceed 12s, the visual angle of 45-135 degrees;
- 3.2 Light: 2x40w cool white fluorescent lamp, the light source is 500-550mm away from the lens surface; in order to make the appearance defect can be correctly recognized, the illumination should be 500-1000Lux, and the observation time is 10 seconds.
  - 3.3 Visual inspection staff should be 1.0 (including corrected visual acuity) above, no color blindness, color weakness.

#### 4 Appearance inspection standards

Test items	Judging standard	Inspection equipment	Defect level		
resciteriis		Testing method	MI	MA	CR
	When start the machine and process, all products have to check the appearance of the sample, the appearance of the sample is divided into qualified samples and limited samples.				
Check the sample	1: Qualified sample refers to the appearance and structure standard of the product which recognized by the client, the sample size should be confirmed before mass production;	Sample comparison , visual			√

1		Ī	1	Ī	
	2: The limited sample refers to the limit of a particular exceptionally developed sample. Limit the sample only for its specific point of exception to confirm; The priority is higher than the other criteria in this table. When there is a limited sample, the limit sample shall prevail.				
Raw edge	Not allowed to affect the size and assembly	Visual, point card		√	
Scratch	1: Non-optical surface and non-exposed surface scratches should be visually insignificant and the length is less than 1/10 of the maximum surface size.	Visual, point card, calipers		<b>√</b>	
Fingerprint				√	
Foreign objects, black spots, white spots	The product may not be attached to foreign objects, including oil, fiber, dregs of water gap and so on				<b>√</b>
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler			<b>√</b>
Poor ejection	Products may not appear bad ejection, including no convex top, thimble printed on the assembly surface shall not be higher than the product surface, non-assembled surface thimble height should not exceed the product size tolerances; thimble printing should be less than the product surface and no more than 0.3; thimble surface treatment should be consistent with the product side.  Ejection strain: the optical surface and the appearance of the exposed surface after assembly are not allowed to have a strain, and the structural surface does not allow visual obvious strain.	Visual, point card		✓	
Insufficient filling	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces, The signature sample shall prevail.	Visual, point card		√	
Shrink	When the entire surface of the product shrinks, the optical properties and dimensions must meet the requirements, and the visual will not significantly affect the appearance.Part shrink reference point defects	Visual, point card		√	
Flow marks、Welding line	<ol> <li>1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;</li> <li>2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two</li> </ol>	Visual		✓	

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white spots	Not obvious or D ≤ 0.3mm black spots and foreign bodies in the area of 100x100mm not more than 1; Exceeded foreign matter black spots is judged bad.	Visual, point card	<b>√</b>		
Damaged	No damage is allowed	Visual			√
Cold glue	Optical surface may not have cold glue, non- optical surface cold glue should meet the visual is not obvious.	Visual	<b>√</b>		
	1: Do not affect the product size, shall not penetrate the optical surface, the cut should be smooth;	Visual			
Bad incision	2: Laser cutting products, the optical surface burns shall not occur after the processing is completed. Beading must not affect product installation				√
	3: Three molds and hot runner gate shall not appear residue.				
Scrub	Scrub surface should be uniform, off the scrub phenomenon should not be obvious , A single off scrub imprint requires D $\leq$ 1 mm and no more than 1 area within a 50x50 mm area	Visual		√	