



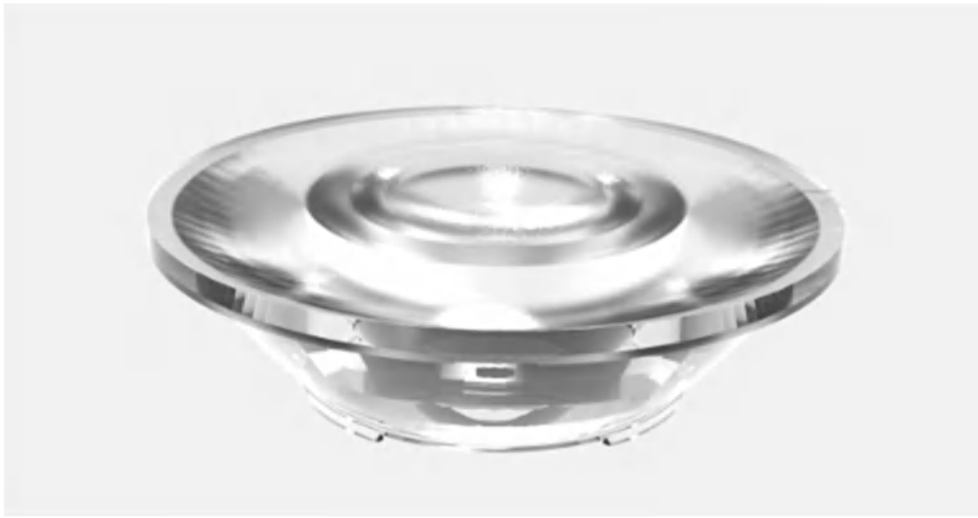
**HERCULUX** Chengdu HercuLux Photoelectric  
恒坤光电 Technology Co.,Ltd  
**Product Approval**

Approval number :

Customer :

Manufacturer : Chengdu HercuLux Photoelectric Technology Co.,Ltd

PN	Code	Product
HK-44@11-15-D6-20-1g-1	1. 01. 6752	HK 44@11-15° Lens
HK-44@11-24-D9-20-1g-1	1. 01. 6753	HK 44@11-24° Lens
HK-44@11-36-D9-20-1g-1	1. 01. 6754	HK 44@11-36° Lens
HK-44@11-45-D6-20-1g-1	1. 01. 02606	HK 44@11-45° Lens
HK-44@11-60-D9-20-1g-1	1. 01. 81383	HK 44@11-60° Lens



Supplier confirmation				Client confirmation			
Proposed		DATE		Qualified <input type="checkbox"/>		DATE	
Project manager		DATE		Unqualified <input type="checkbox"/>		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

<http://www.herculux.cn/>

Sales Dept: Shenzhen Nanshan District Nanshan Cloud Valley Innovation Industrial Park Comprehensive Service Building,

TEL: 0755-2937 1541

FAX: 0755-2907 5140

\*Approval In duplicate , for both supplier and customer.

# Product Approv

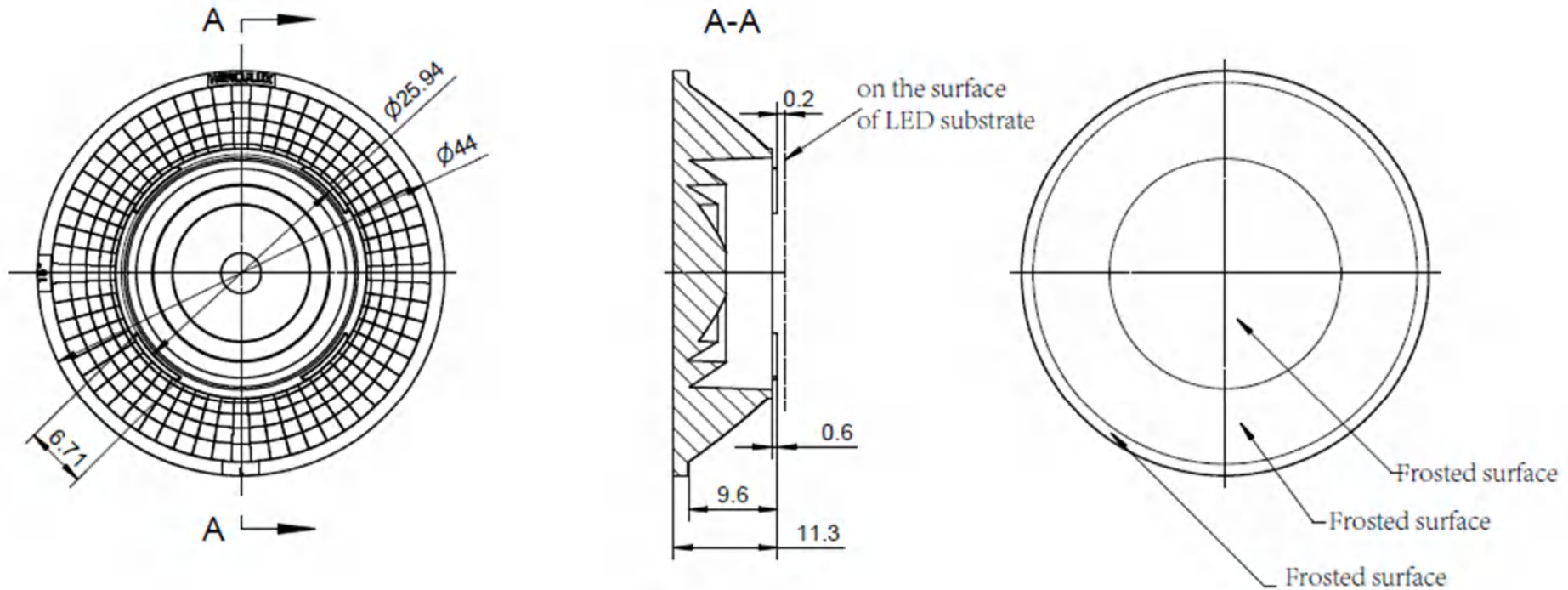
TEL: 0755-2937 1541

FAX: 0755-2907 5140

<http://www.herculux.cn/>

Date updated: 2021/11/17

<p>Product Picture:</p>	
<p>PN:</p>	<p>HK-44@11-15-D6-20-1g-1</p>
<p>Size(L*W*H/Φ*H):</p>	<p>Φ:44mm; H:11.3mm</p>
<p>Material:</p>	<p>PC</p>
<p>Efficiency:</p>	<p>\</p>
<p>Temperature(Topr):</p>	<p>Material extreme temperature resistance : -40°C to +120°C long-term use temperature : -40°C to +90°C</p>
<p>FWHM:</p>	<p>15°/24°/36°45°/60°</p>
<p>Matched LES:</p>	<p>D6/D9</p>

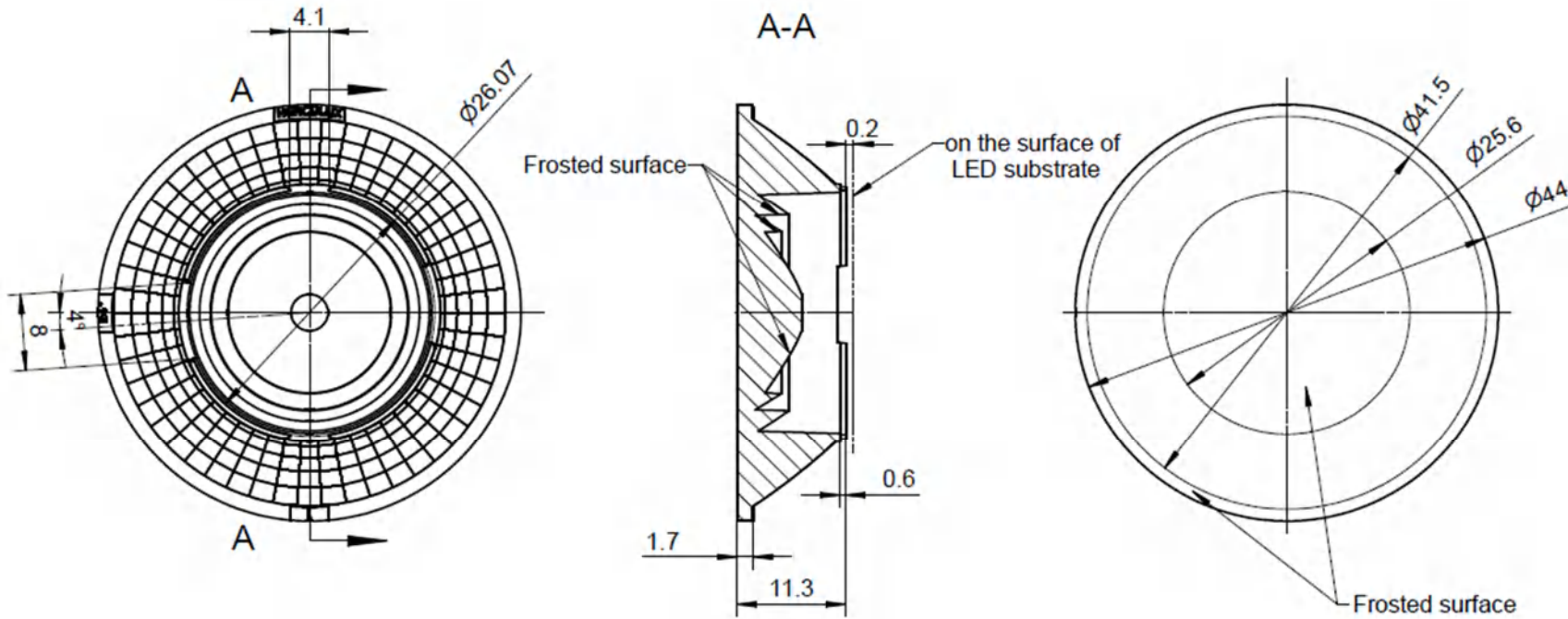


Technical remark:

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.
- \*4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: Ra<3.2μm

Optical design			HK 44@11-15°Lens	HK-44@11-15-D6-20-1g-1		
Structure design				1.01.6752		
Review				Number of drawing	qty	weight
Validation				CDHK		
			Material:	PC		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450	
	olerance valu	±0.1	±0.15	±0.20	±0.35	±0.50	±0.80	±1.2	±2.0	

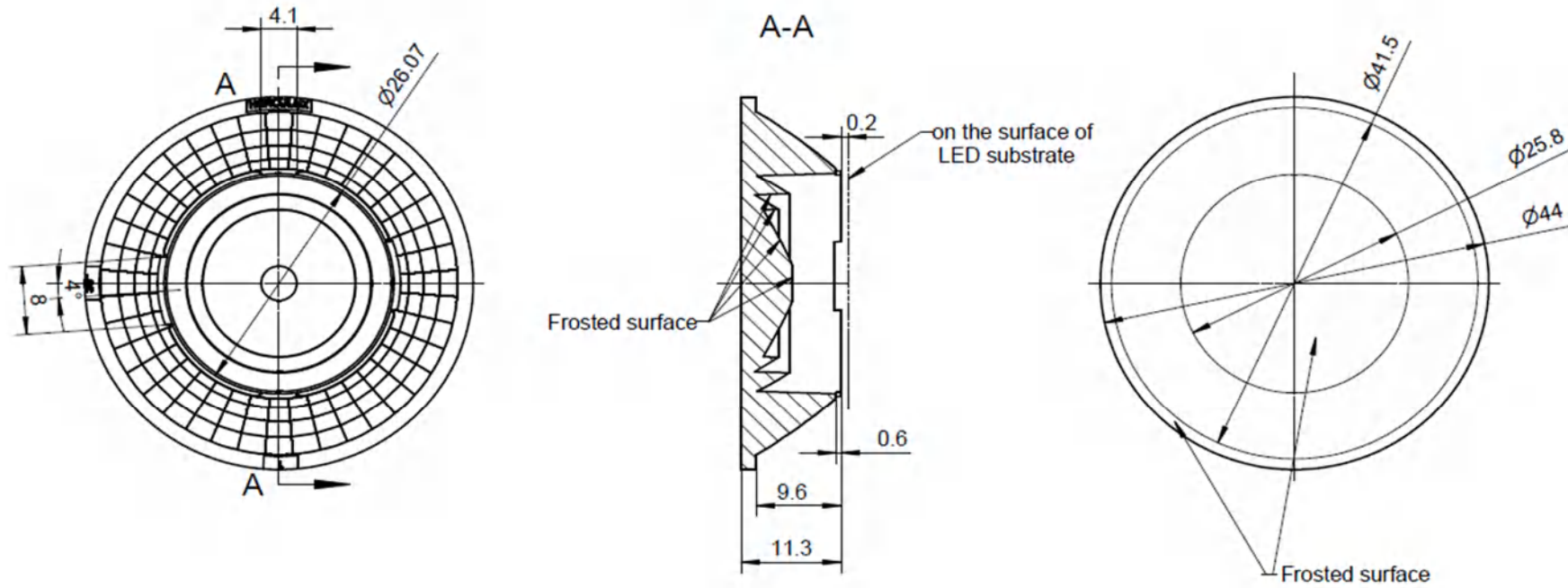


**Technical remark:**

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.
- \*4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required:  $Ra < 3.2\mu m$

Optical design			HK 44@11-24°Lens		HK-44@11-24-D9-20-1g-1	
Structure design					1.01.6753	
Review					Number of drawing	qty
Validation					weight	
			Material:	PC	CDHK	

MT5 Tolerance table (mm)	Basic size olerance valu	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
		±0.1	±0.15	±0.20	±0.35	±0.50	±0.80	±1.2	±2.0

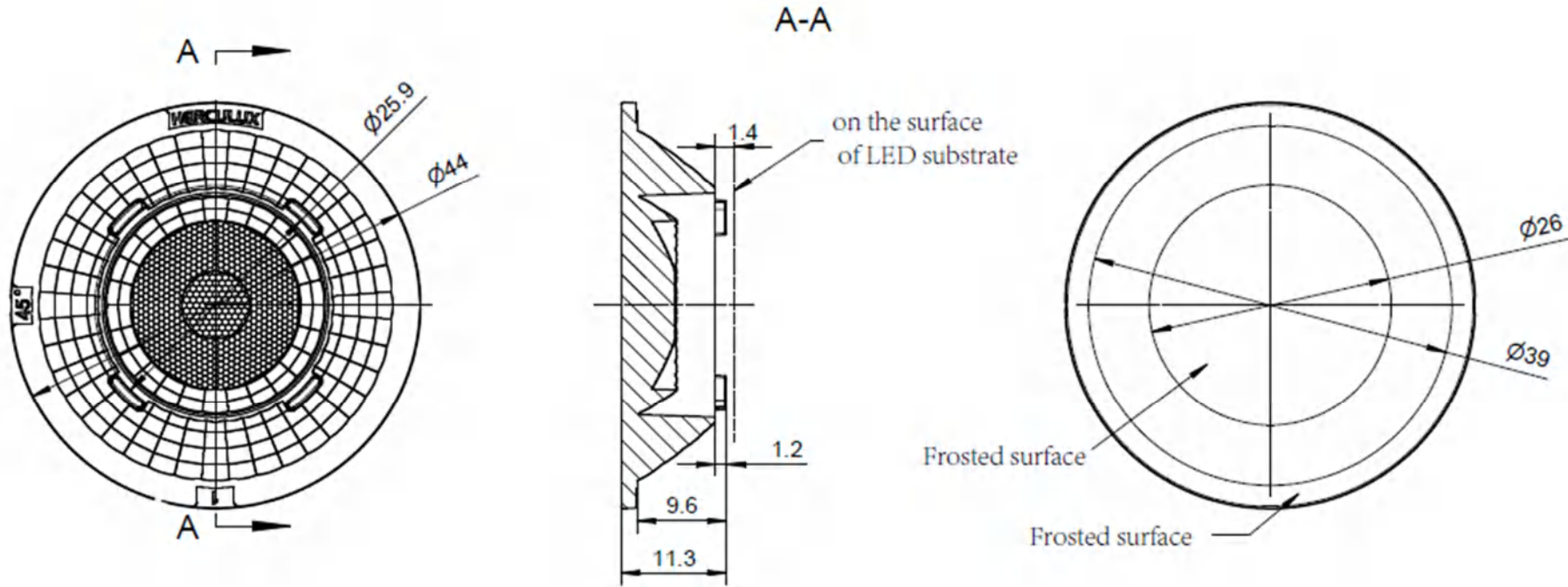


**Technical remark:**

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.
- \*4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required:  $Ra < 3.2\mu m$

Optical design			HK 44@11-36°Lens		HK-44@11-36-D9-20-1g-1		
Structure design					1.01.6754		
Review				number of drawing	qty	weight	
Validation			Material:	PC	CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.20	±0.35	±0.50	±0.80	±1.2	±2.0

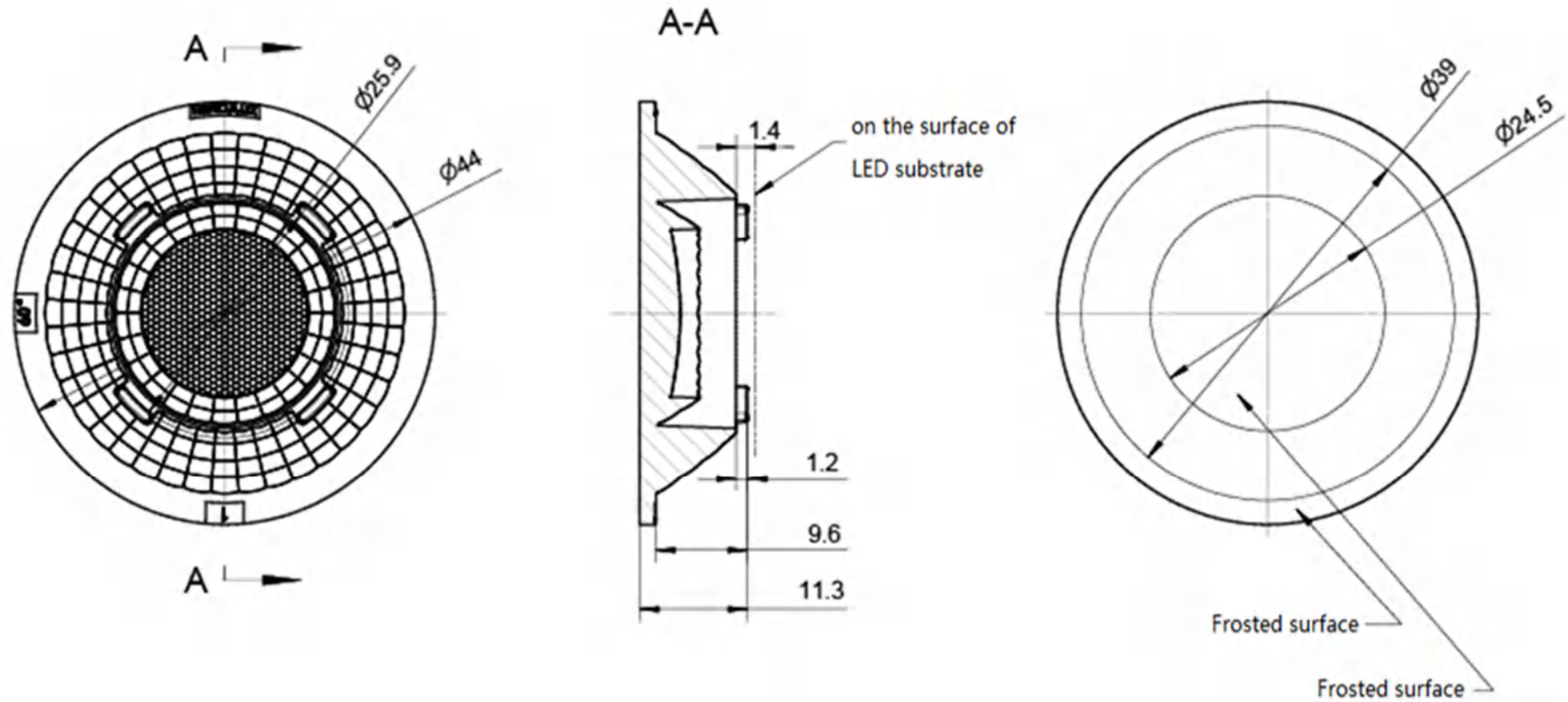


**Technical remark:**

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.
- \*4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: Ra<3.2μm

Optical design			HK 44@11-45°Lens	HK-44@11-45-D6-20-1g-1		
Structure design				1.01.02606		
Review				Number of drawing	qty	weight
Validation				CDHK		
			Material:	PC		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	olerance valu	±0.1	±0.15	±0.20	±0.35	±0.50	±0.80	±1.2	±2.0



**Technical remark:**

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.
- \*4. When the lamp adopts rubber ring for waterproofing: the roughness of the contact surface between the radiator and the rubber ring is required: Ra<3.2µm

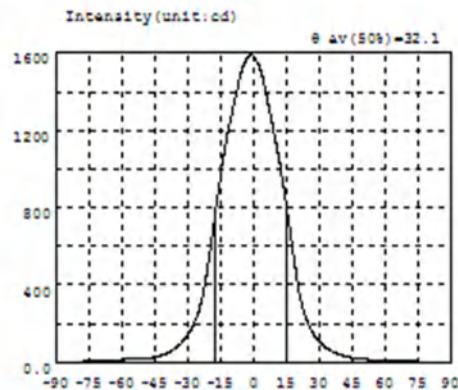
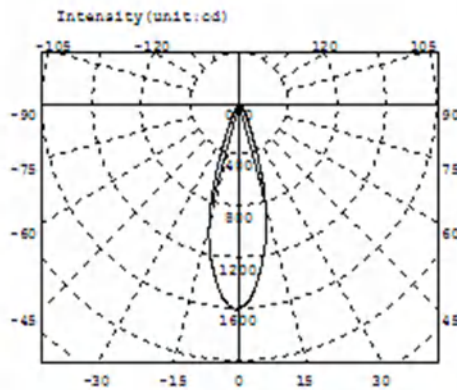
Optical design			HK 44@11-60°Lens		HK-44@11-60-D9-20-1g-1		
Structure design					1.01.81383		
Review					Number of drawing	qty	weight
Validation			Material:	PC	CDHK		

MT5 Tolerance table (mm)	Basic size	<3	3~10	10~24	24~65	65~140	140~250	250~450	>450
	tolerance value	±0.1	±0.15	±0.20	±0.35	±0.50	±0.80	±1.2	±2.0









Intensity data: (deg , cd) CO-180

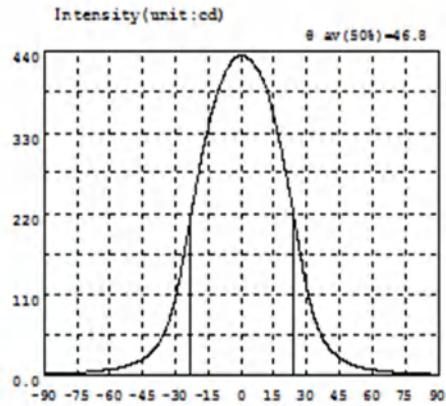
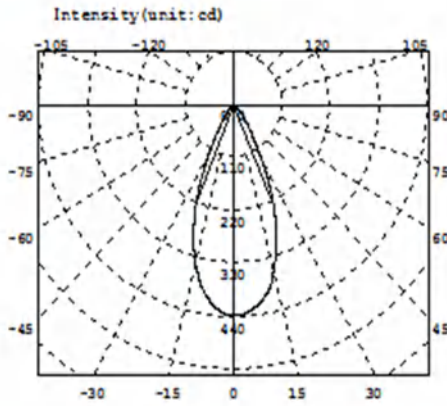
A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.8153	-58.5	16.15	-27.0	204.5	4.5	1456	36.0	55.41	67.5	7.269
-88.5	0.9560	-57.0	19.66	-25.5	246.6	6.0	1377	37.5	47.16	69.0	6.578
-87.0	1.199	-55.5	20.94	-24.0	301.6	7.5	1295	39.0	40.71	70.5	5.930
-85.5	1.543	-54.0	20.49	-22.5	378.2	9.0	1205	40.5	35.40	72.0	5.322
-84.0	1.940	-52.5	18.57	-21.0	477.9	10.5	1122	42.0	30.90	73.5	4.745
-82.5	2.399	-51.0	17.82	-19.5	592.6	12.0	1029	43.5	26.96	75.0	4.255
-81.0	2.809	-49.5	18.64	-18.0	714.7	13.5	924.6	45.0	23.75	76.5	3.730
-79.5	3.335	-48.0	20.62	-16.5	841.3	15.0	811.3	46.5	20.94	78.0	3.189
-78.0	3.947	-46.5	23.24	-15.0	963.4	16.5	690.2	48.0	18.72	79.5	2.698
-76.5	4.521	-45.0	26.32	-13.5	1075	18.0	569.2	49.5	16.66	81.0	2.212
-75.0	5.072	-43.5	30.20	-12.0	1171	19.5	454.2	51.0	14.97	82.5	1.822
-73.5	5.696	-42.0	35.09	-10.5	1254	21.0	348.8	52.5	13.56	84.0	1.454
-72.0	6.234	-40.5	41.46	-9.0	1332	22.5	279.4	54.0	12.45	85.5	1.198
-70.5	6.818	-39.0	49.10	-7.5	1409	24.0	226.2	55.5	11.59	87.0	1.048
-69.0	7.352	-37.5	58.16	-6.0	1483	25.5	184.5	57.0	10.91	88.5	0.9809
-67.5	7.923	-36.0	68.95	-4.5	1535	27.0	152.1	58.5	10.53	90.0	0.8827
-66.0	8.657	-34.5	82.00	-3.0	1571	28.5	126.8	60.0	10.45		
-64.5	9.526	-33.0	97.59	-1.5	1593	30.0	106.6	61.5	10.02		
-63.0	10.24	-31.5	116.7	0.0	1583	31.5	89.92	63.0	9.438		
-61.5	10.96	-30.0	140.1	1.5	1556	33.0	76.60	64.5	8.729		
-60.0	13.02	-28.5	169.1	3.0	1518	34.5	65.28	66.0	8.072		

Electricity Parameter:

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

Optical Parameter (Distance=2.559m):

Equivalent Luminous flux:  $\Phi_{eff}=575.4lm$       Efficiency:  $Eff=166.81lm/W$   
Diffuse angle:      @ (25%): 42.3deg @ (50%): 32.1deg @ (75%): 20.6deg @ (50%): 32.1deg  
Diffuse angle:      @ (25%): 42.4deg @ (50%): 32.2deg @ (75%): 20.9deg @ (50%): 32.2deg  
Imax=1593cd (C=0.0deg, G=-1.0deg)      CO-180Plane Imax= 1593cd (G=-1.0deg)  
CO-180Plane IO= 1583cd



Intensity data:(deg , cd) C0-180

A	I	A	I	A	I	A	I	A	I	A	I
-90.0	0.6497	-58.5	7.871	-27.0	148.3	4.5	427.7	36.0	58.60	67.5	4.291
-88.5	0.9795	-57.0	8.783	-25.5	173.1	6.0	422.7	37.5	49.51	69.0	3.903
-87.0	0.9295	-55.5	9.919	-24.0	198.4	7.5	416.6	39.0	42.06	70.5	3.528
-85.5	1.119	-54.0	11.18	-22.5	224.3	9.0	408.6	40.5	35.97	72.0	3.176
-84.0	1.286	-52.5	12.38	-21.0	247.4	10.5	399.2	42.0	30.91	73.5	2.833
-82.5	1.467	-51.0	13.62	-19.5	273.7	12.0	387.9	43.5	26.61	75.0	2.534
-81.0	1.698	-49.5	15.06	-18.0	296.2	13.5	370.6	45.0	23.04	76.5	2.186
-79.5	1.945	-48.0	16.86	-16.5	317.6	15.0	351.5	46.5	20.06	78.0	1.915
-78.0	2.240	-46.5	18.91	-15.0	337.0	16.5	332.7	48.0	17.49	79.5	1.680
-76.5	2.558	-45.0	21.36	-13.5	355.0	18.0	312.8	49.5	15.31	81.0	1.463
-75.0	2.914	-43.5	24.32	-12.0	371.7	19.5	291.3	51.0	13.47	82.5	1.264
-73.5	3.241	-42.0	27.88	-10.5	386.9	21.0	268.3	52.5	11.88	84.0	1.066
-72.0	3.568	-40.5	32.16	-9.0	399.1	22.5	243.8	54.0	10.59	85.5	0.9111
-70.5	3.912	-39.0	37.27	-7.5	409.5	24.0	218.6	55.5	9.368	87.0	0.7331
-69.0	4.260	-37.5	43.50	-6.0	418.3	25.5	192.4	57.0	7.948	88.5	0.6879
-67.5	4.639	-36.0	51.29	-4.5	425.2	27.0	166.9	58.5	7.434	90.0	0.7926
-66.0	5.043	-34.5	60.89	-3.0	430.6	28.5	142.1	60.0	6.757		
-64.5	5.508	-33.0	72.71	-1.5	433.9	30.0	119.3	61.5	6.268		
-63.0	6.054	-31.5	87.18	0.0	435.2	31.5	99.64	63.0	5.721		
-61.5	6.636	-30.0	104.2	1.5	434.4	33.0	83.20	64.5	5.153		
-60.0	7.228	-28.5	124.9	3.0	431.9	34.5	69.73	66.0	4.733		

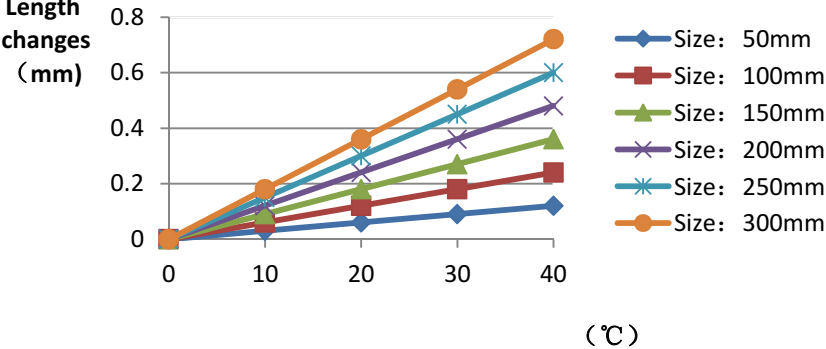
Electricity Parameter:

Current I: 0.1000A      Power: 3.250W  
 Voltage V: 32.50V      PF: 1.000

Optical Parameter(Distance=2.559m):

Equivalent Luminous flux:  $\Phi_{eff}$  = 297.5lm      Efficiency:  $E_{ff}$  = 91.55lm/W  
 Diffuse angle: @ (25%) : 60.3deg @ (50%) : 46.8deg @ (75%) : 32.7deg @ (50%) : 46.8deg  
 Diffuse angle: @ (25%) : 60.3deg @ (50%) : 46.8deg @ (75%) : 32.7deg @ (50%) : 46.8deg  
 I<sub>max</sub> = 435.2cd (C=0.0deg, G=0.0deg)      C0-180Plane I<sub>max</sub> = 435.2cd (G=0.0deg)  
 C0-180Plane I<sub>0</sub> = 435.2cd



	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	44		44.15	44.18	44.15	44.18		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	11.3		11.43	11.4	11.43	11.4																																												
	height	9.6		9.62	9.62	9.63	9.64																																												
	Gate shear can not affect the appearance of the lamp																																																		
See attachment "Appearance Inspection Standards"																																																			
2.Appearance Quality	See attachment "Appearance Inspection"	E	No burr	No burr	No burr	No burr	OK																																												
			No stains	No stains	No stains	No stains																																													
3.Material	PC			Color	Transparent			OK																																											
4.Optical index	Testing LED	CREE1512																																																	
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested																																																		
	FWHM	See light distribution curve																																																	
	angle		18.2°	18.1°	18.4°	18.5°																																													
	K-value		5.27	5.29	5.13	5.13																																													
	Efficiency		85.7%	86.2%	86.2%	85.2%																																													
Facult	See the signature sample																																																		
Comprehensive judgment	Qualified																																																		
Remarks:	<p>1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.</p> <p>2、 Ambient temperature on the size of the product refer to the table on the right</p>																																																		
	<p style="text-align: center;"><b>PC product size changes with temperature table</b></p>  <table border="1"> <caption>Data for PC product size changes with temperature table</caption> <thead> <tr> <th>Temperature (°C)</th> <th>50mm</th> <th>100mm</th> <th>150mm</th> <th>200mm</th> <th>250mm</th> <th>300mm</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>10</td> <td>0.05</td> <td>0.08</td> <td>0.12</td> <td>0.15</td> <td>0.18</td> <td>0.22</td> </tr> <tr> <td>20</td> <td>0.10</td> <td>0.15</td> <td>0.20</td> <td>0.25</td> <td>0.30</td> <td>0.35</td> </tr> <tr> <td>30</td> <td>0.15</td> <td>0.22</td> <td>0.28</td> <td>0.35</td> <td>0.42</td> <td>0.50</td> </tr> <tr> <td>40</td> <td>0.20</td> <td>0.28</td> <td>0.35</td> <td>0.45</td> <td>0.55</td> <td>0.65</td> </tr> </tbody> </table>									Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm	0	0.00	0.00	0.00	0.00	0.00	0.00	10	0.05	0.08	0.12	0.15	0.18	0.22	20	0.10	0.15	0.20	0.25	0.30	0.35	30	0.15	0.22	0.28	0.35	0.42	0.50	40	0.20	0.28	0.35	0.45	0.55	0.65
Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm																																													
0	0.00	0.00	0.00	0.00	0.00	0.00																																													
10	0.05	0.08	0.12	0.15	0.18	0.22																																													
20	0.10	0.15	0.20	0.25	0.30	0.35																																													
30	0.15	0.22	0.28	0.35	0.42	0.50																																													
40	0.20	0.28	0.35	0.45	0.55	0.65																																													
Precautions:	<p>1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.</p> <p>2、 Take the lens try to avoid touching the total reflection surface.</p> <p>3、 When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.</p> <p>4. The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.</p>																																																		

	Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	diameter	44		44.06	44.06	44.04	44		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	height	11.3		11.34	11.34	11.35	11.37		
	height	9.6		9.58	9.58	9.63	9.6		
Gate shear can not affect the appearance of the lamp									
See attachment "Appearance Inspection Standards"									

2.Appearance Quality	See attachment "Appearance Inspection"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC	Color	Transparent	OK
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4.Optical index	Testing LED	CREE1507N				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested					
	FWHM	See light distribution curve				
	angle		20.9°	21.1°	21.8°	21.8°
	K-value		4.43	4.48	4.23	4.23
	Efficiency		89.12%	87.47%	86.42%	86.42%
Facult	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:

- Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.
- Ambient temperature on the size of the product refer to the table on the right

### PC product size changes with temperature table

Temperature (°C)	50mm (mm)	100mm (mm)	150mm (mm)	200mm (mm)
0	0.00	0.00	0.00	0.00
10	0.05	0.10	0.15	0.20
20	0.10	0.20	0.30	0.40
30	0.15	0.30	0.45	0.55
40	0.20	0.40	0.60	0.75

- Precautions:
- 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.
  - The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks																																										
1.Size	diameter	44			44.12	44.12	44.14	44.12		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.																																										
	height	11.3			11.45	11.45	11.44	11.4																																												
	height	9.6			9.6	9.6	9.65	9.6																																												
	Gate shear can not affect the appearance of the lamp																																																			
See attachment "Appearance Inspection Standards"																																																				
2.Appearance Quality	See attachment "Appearance Inspection"	E	No burr	No burr	No burr	No burr	No burr	No burr	OK																																											
			No stains	No stains	No stains	No stains	No stains																																													
3.Material	PC			Color	Transparent			OK																																												
4.Optical index	Testing LED	CREE1507N																																																		
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested and																																																			
	FWHM	See light distribution curve																																																		
	angle		32.1°	32.6°	32°	32°																																														
	K-value		2.77	2.77	2.83	2.83																																														
	Efficiency		88.10%	88.40%	87.55%	87.55%																																														
Facult	See the signature sample																																																			
Comprehensive judgment	Qualified																																																			
Remarks:	<p>1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.</p> <p>2、 Ambient temperature on the size of the product refer to the table on the right</p>																																																			
	<p align="center"><b>PC product size changes with temperature table</b></p> <table border="1"> <caption>Data for PC product size changes with temperature table</caption> <thead> <tr> <th>Temperature (°C)</th> <th>50mm</th> <th>100mm</th> <th>150mm</th> <th>200mm</th> <th>250mm</th> <th>300mm</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>10</td> <td>0.05</td> <td>0.08</td> <td>0.10</td> <td>0.12</td> <td>0.15</td> <td>0.18</td> </tr> <tr> <td>20</td> <td>0.08</td> <td>0.12</td> <td>0.15</td> <td>0.18</td> <td>0.22</td> <td>0.28</td> </tr> <tr> <td>30</td> <td>0.10</td> <td>0.15</td> <td>0.20</td> <td>0.25</td> <td>0.30</td> <td>0.38</td> </tr> <tr> <td>40</td> <td>0.12</td> <td>0.18</td> <td>0.25</td> <td>0.32</td> <td>0.40</td> <td>0.50</td> </tr> </tbody> </table>										Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm	0	0.00	0.00	0.00	0.00	0.00	0.00	10	0.05	0.08	0.10	0.12	0.15	0.18	20	0.08	0.12	0.15	0.18	0.22	0.28	30	0.10	0.15	0.20	0.25	0.30	0.38	40	0.12	0.18	0.25	0.32	0.40	0.50
Temperature (°C)	50mm	100mm	150mm	200mm	250mm	300mm																																														
0	0.00	0.00	0.00	0.00	0.00	0.00																																														
10	0.05	0.08	0.10	0.12	0.15	0.18																																														
20	0.08	0.12	0.15	0.18	0.22	0.28																																														
30	0.10	0.15	0.20	0.25	0.30	0.38																																														
40	0.12	0.18	0.25	0.32	0.40	0.50																																														
Precautions:	<p>1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.</p> <p>2、 Take the lens try to avoid touching the total reflection surface.</p> <p>3、 When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.</p> <p>4. The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.</p>																																																			

		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Test result5	Test result6	Test result7	Test result8	Judgment	Remarks
1.Size	diameter	44			44.1	44.2	44.2	44.2	44.2	44.2	44.2	44.2		Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium
	height	11.3			11.37	11.4	11.4	11.4	11.4	11.4	11.3	11.4		
	height	9.6			9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63		
Gate shear can not affect the appearance of the lamp														
See attachment "Appearance Inspection Standards"														

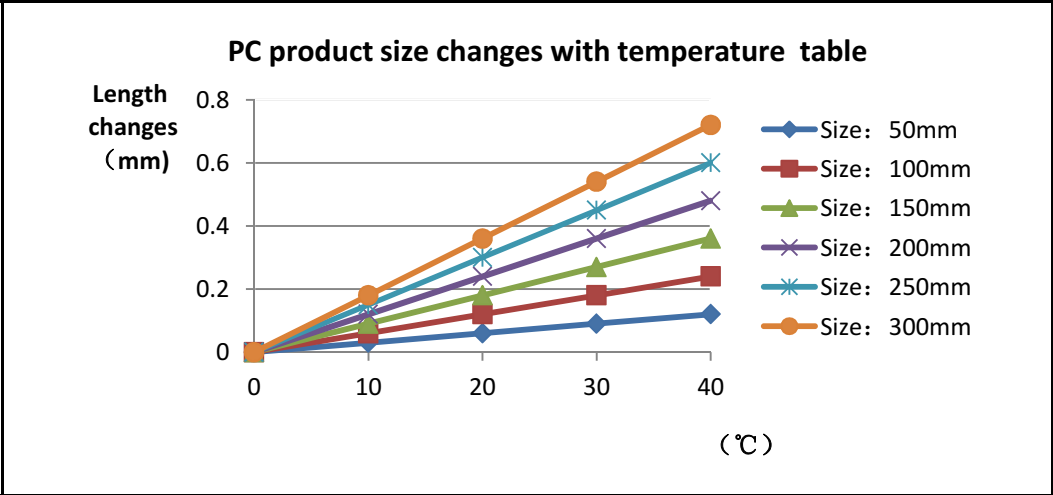
2.Appearance Quality	See attachment "Appearance Inspection"	E	No burr		No burr		No burr		No burr		OK
			No stains		No stains		No stains		No stains		

3.Material	PC		Color		Transparent		OK
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4.Optical index	Testing LED	CREE1512												
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested													
	FWHM	See light distribution curve												
	angle		46.8	45.4	45.5	47.4	46.9	46.4	46.7	44.9				
	K-value													
Efficiency		####	####	####	####	####	####	####	####	####				
Facula	See the signature sample													

Comprehensive judgment	Qualified												
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Remarks:  
 1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.  
 2、 Ambient temperature on the size of the product refer to the table on the right



- Precautions:
- 1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.
  - 2、 Take the lens try to avoid touching the total reflection surface.
  - 3、 When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.
  4. The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.



		Standard size	Upper Size limit	Lower size limit	Test result1	Test result2	Test result3	Test result4	Judgment	Remarks
1.Size	diameter	44			44.04	44.06	44.05			Test environment: In 20 °C -25 °C environment to achieve thermal equilibrium after the test.
	height	11.3			11.32	11.31	11.3			
	height	9.6			9.56	9.55	9.54			
Gate shear can not affect the appearance of the lamp										
See attachment "Appearance Inspection Standards"										

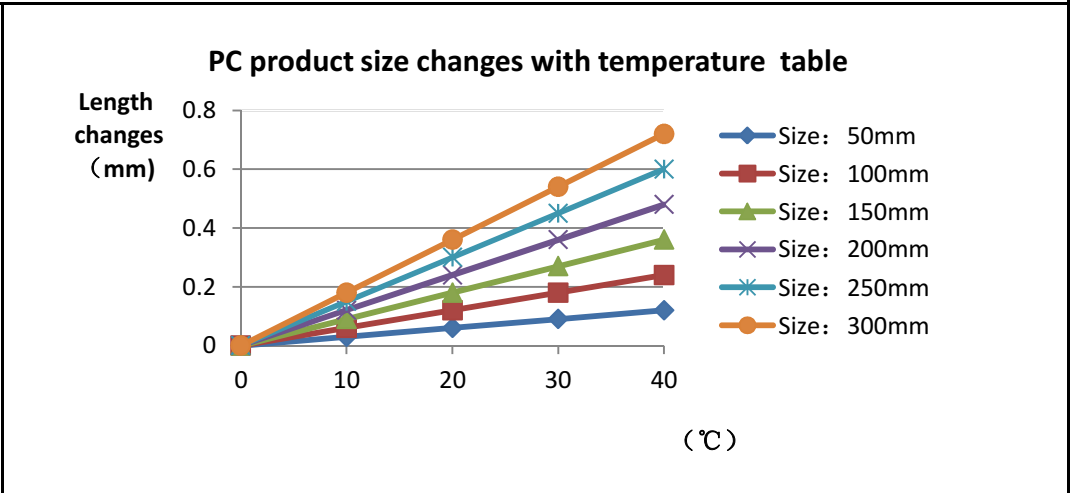
2.Appearance Quality	See attachment "Appearance Inspection"	E	No burr	No burr	No burr	No burr	OK
			No stains	No stains	No stains	No stains	

3.Material	PC		Color	Transparent	OK
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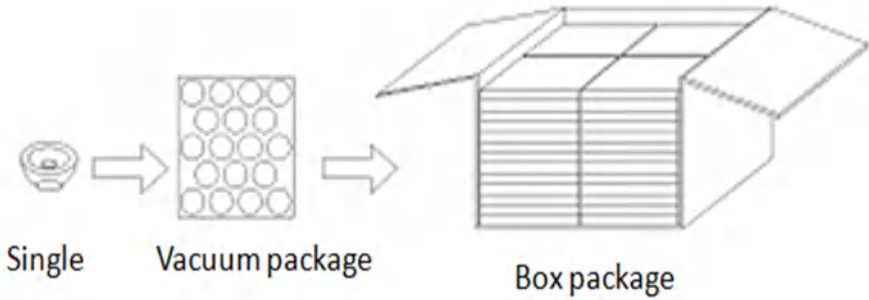
4.Optical index	Testing LED	CREE1507N				
	The recommended size and power rating of the LED light source recommended for this lens should be comparable to the source of the test, if it is required to be out of range. According to the heat dissipation capability of the lamp and the actual conditions of the use environment, the lens should be fully tested					
	FWHM	See light distribution curve				
	angle		61.8°	62.8°	61.1°	60.6°
	K-value					
	Efficiency		92.03%	91.62%	90.15%	89.69%
Facula	See the signature sample					

Comprehensive judgment	Qualified
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Remarks:  
 1、 Tool Number: V-Vernier Caliper 2D-Quadratic H-Height Gauge M-Tool Microscope P-Needle T-Thick Gauge R-Radius Gauge E-Visual.  
 2、 Ambient temperature on the size of the product refer to the table on the right



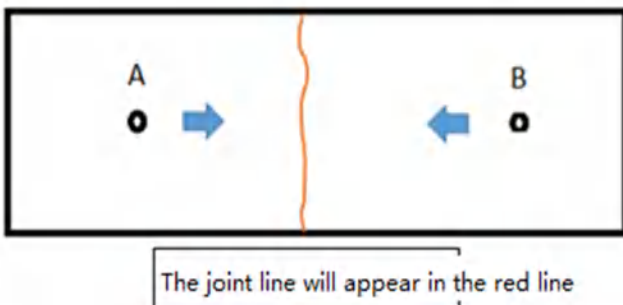
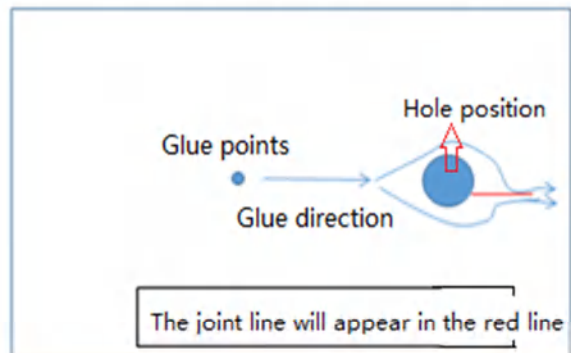
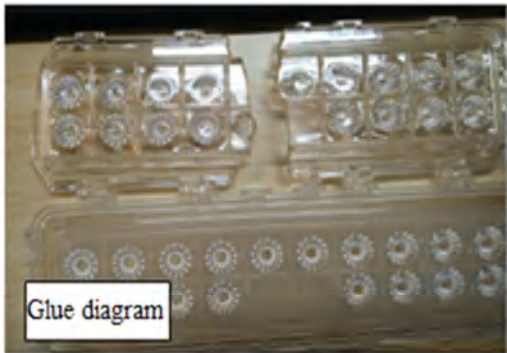
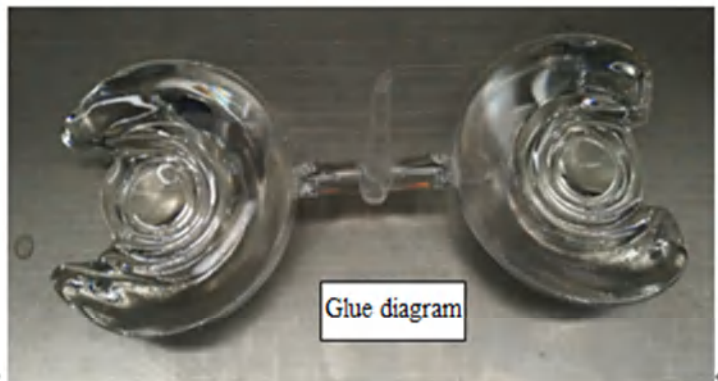
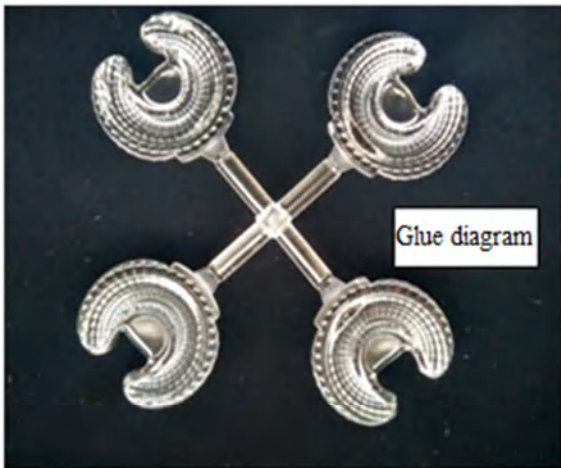
Precautions:  
 1、 Wear clean gloves during lens assembly to prevent contamination of the lens surface.  
 2、 Take the lens try to avoid touching the total reflection surface.  
 3、 When the lens surface contamination, you can only gently wipe with soft cotton sticky neat neutral solvent, not allowed to wipe with industrial solvents.  
 4. The working temperature of the lens should be within the temperature limit of the lens material. Exceeding the temperature limit will cause damage to the lens and affect the service life of the lens.

PN		HK-44@11-15-D6-20-1g-1		Product Name	HK 44@11-15°Lens		
Product material		PC		Customer			
Package diagram		 <p style="text-align: center;">Single      Vacuum package      Box package</p>					
Product packing		18	A/ Box	4	pcs/Layer		
		18	Layer/Box	1296	A/ Carton		
Packaging Materials	NO.	Part No	Part name	Size	Dosage	Unit	Remarks
	1	2.07.0062	Blister box	23cm*21cm	72	BAG	
	2	2.08.0001	PE film	25cm*27cm	72	PCS	
	3	2.06.0005	Reel label paper	62mm*42mm	72	PCS	
	4	2.06.0005	Box label paper	62mm*70mm	1	PCS	
	5	2.06.0003	big plate	46cm*42cm	19	PCS	
	6	2.06.0011	big flat carton	48cm*44cm*37cm	1	PCS	
Remarks	The loose packing is not subject to this specification. Customer's requirements shall prevail						

Special notice

When glue 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:

Syntner



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

#### 1.1.1 Sampling standards, sampling plan and AQL

Test level : GB/T2828.1-2012 The first part is according to the acceptance quality limit (AQL) retrieval batch inspection sampling plan, general inspection level II 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 description	Unit	Code		Code description	Unit
N	Amount/pcs	pcs	D		Diameter	mm
L	Length	mm	H		Depth	mm
W	Width	mm	DS		Distance	mm
S	Proportion	mm <sup>2</sup>	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		
		Testing method	MI	MA	CR
Check the sample	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.	Sample comparison , visual			
	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;				

	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		√	
Fingerprint	Fingerprints are not allowed on all products	Visual		√	
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				√
Deformation	Insufficient filling shall not affect the appearance of the assembly and the exposed surfaces.	Visual, feeler			√
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.	Visual, point card		√	
	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.				
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	1 : Product does not allow the presence of flow marks and welding lines unless the structure can not be avoided;	Visual		√	
	2: The remaining flow marks shall not appear in the optical surface, a single L ≤ 10mm, no more than two				

Bubble	No bubbles are allowed	Visual		√	
Foreign objects, black spots, white spots	Not obvious or $D \leq 0.3\text{mm}$ 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	√		
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	√		
Bad incision	1: Do not affect the product size, shall not penetrate the optical surface, the cut should be smooth;	Visual			√
	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 $D \leq 1\text{ mm}$ and no more than 1 area within a 50x50 mm area	Visual		√	