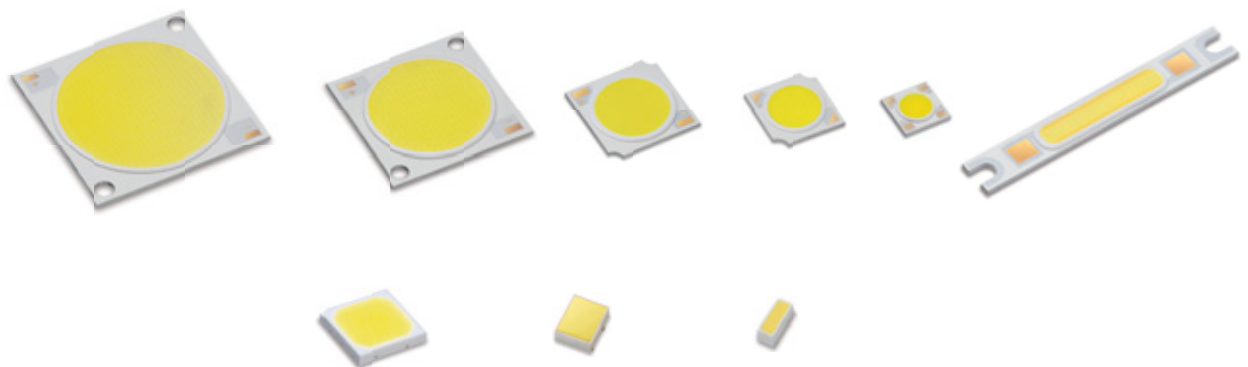




Short Form Lighting LED Catalog 2013 Products for General Lighting

# COB High-wattage Series & Low-wattage Series

2013 New Specifications



# Concept of Our LED

## Superiority with Reliability

- Optimized die positioning
- Color control : 3-step MacAdam Ellipse
- Long life

## Various Product Line-ups

- Suitable products for your application

## High Efficacy and High Power

- Providing a wide selection for brightness and efficacy

Citizen Electronics is the "1st COB Manufacturer."

We continue to lead the LED industry as an inventor of high-wattage LED packages and aspire to be your best business partner.

We never stop challenging ourselves to improve our technology.

Our passion is to never give up until we meet your expectation.

Our proposals never sacrifice the optimum result.

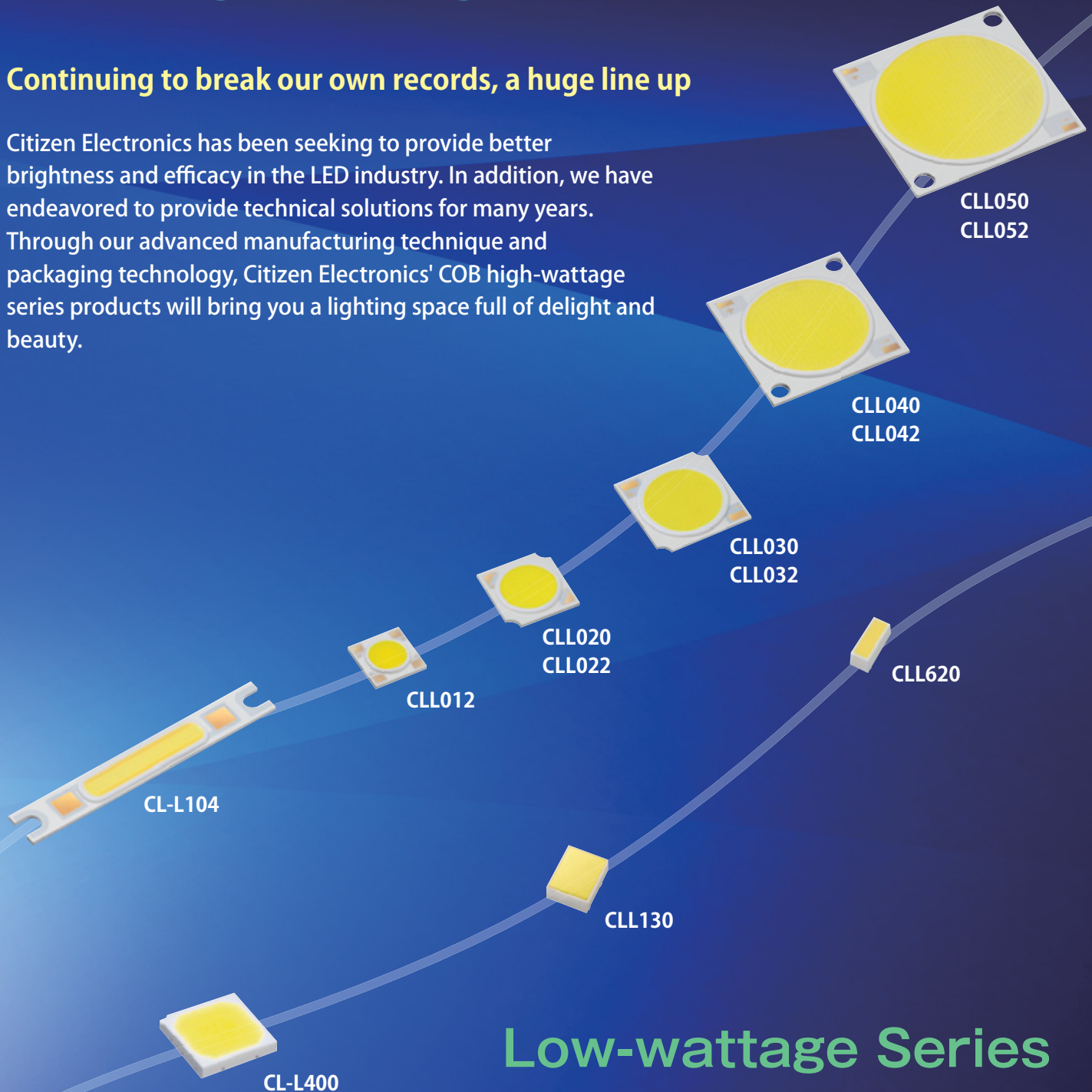
Everything we make is to stretch your imagination.



# COB High-wattage Series

## Continuing to break our own records, a huge line up

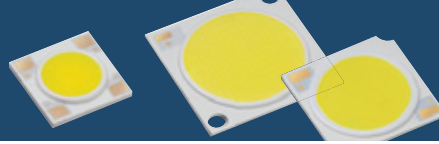
Citizen Electronics has been seeking to provide better brightness and efficacy in the LED industry. In addition, we have endeavored to provide technical solutions for many years. Through our advanced manufacturing technique and packaging technology, Citizen Electronics' COB high-wattage series products will bring you a lighting space full of delight and beauty.



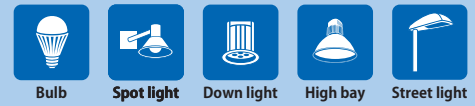
## Low-wattage Series

### Continuing to seek light grace, 3-step MacAdam Ellipse

Linear, rectangular, spiral; our smallest LED components enable us to create and design new LED lighting as you desire. Our surface mounted low-wattage LEDs aim at providing LED lighting that is more exciting, cater better to our lifestyles, and inspire luminaire designers with fantastic ideas.

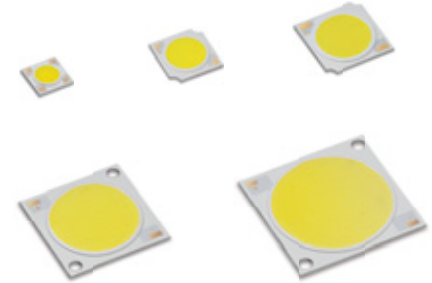


**CLL012/ CLL020, CLL022/ CLL030, CLL032/ CLL040, CLL042/ CLL050, CLL052**



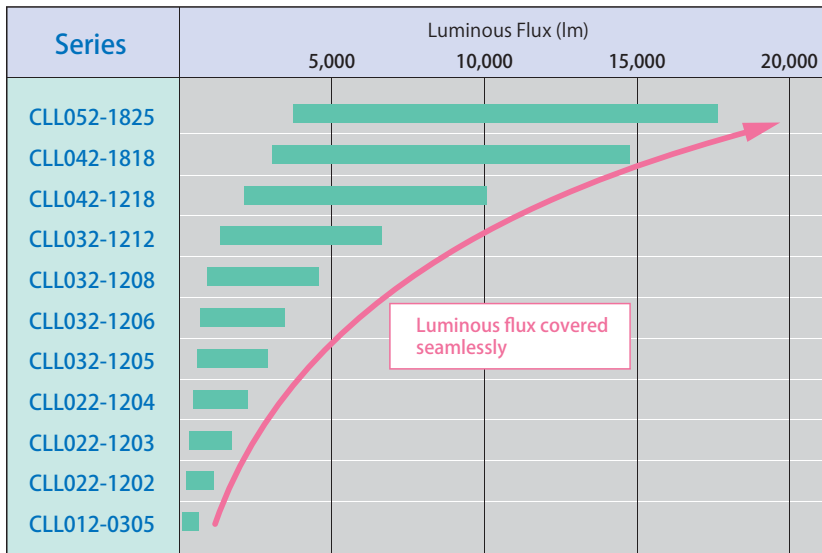
**Possibility of wide selection of brightness and efficacy**

The new COB Series covers a range of luminous flux with only 5 components, from one produced by a 10W incandescent bulb to one produced by a 300W mercury lamp, both of which are conventional light sources. The adopted element arrangement is capable of utilizing light more effectively. It is also possible to set efficacy at up to 155lm/W LED driving conditions due to the product covering a wide range of luminous flux efficacy.



**Variations in Luminous Flux**

(5,000K, Ra 65 Typ.)



**Optimized die positioning**

Our original chip alignment which creates excellent luminance uniformity.

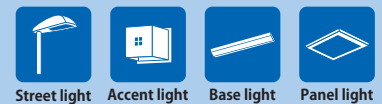


Previous



Current

**CL-L104**



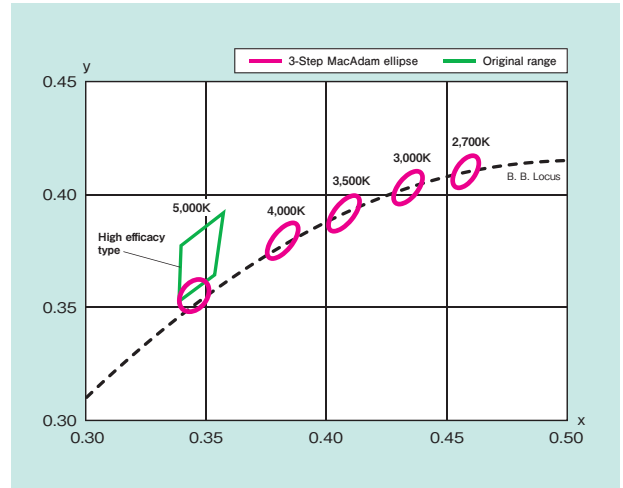
The newest model of the CLL100 series, which was the first COB LED in the market, will be launched in 2013

Slim-type linear light-emitting package for use with a wide variety of light source modules.



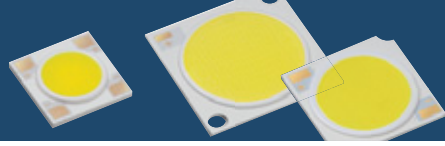
## Chromaticity range with minimal color variability

Ra Min.80 and 90 type is compliant with 3-step MacAdam Ellipse. Due to the success in color control in the LED manufacturing process, we have built up a good reputation for our customers by providing their lighting appliances with little color variability. High efficacy type is compliant with ANSI C78.377.


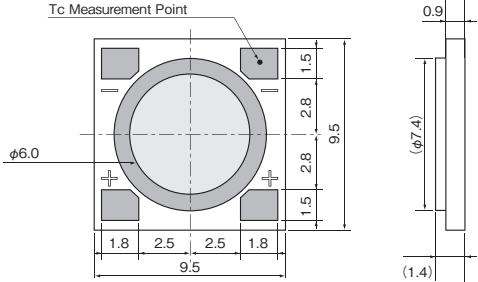

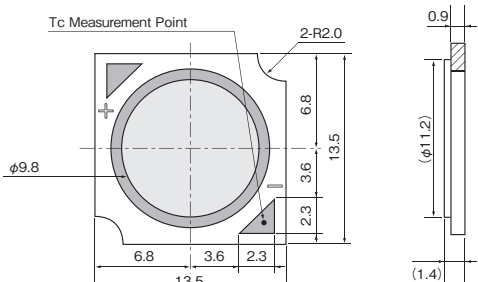

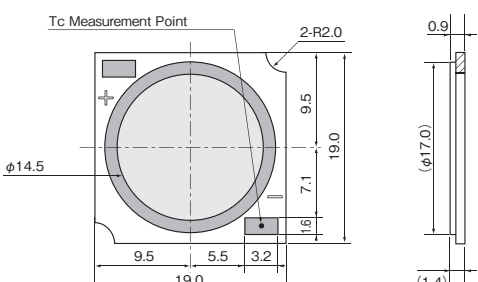

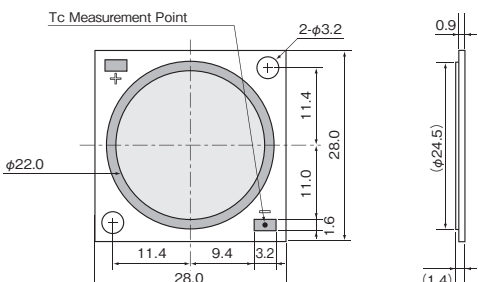

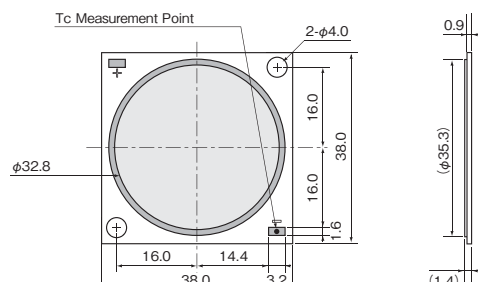


## Color Variations


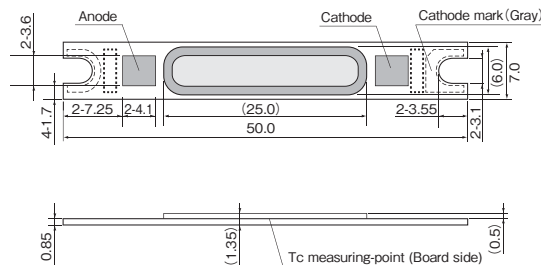
Series	Type	High efficacy type	Ra 80 Min. type (3-step MacAdam Ellipse)					Ra 90 Min. type (3-step MacAdam Ellipse)				
		5,000K	5,000K	4,000K	3,500K	3,000K	2,700K	5,000K	4,000K	3,500K	3,000K	2,700K
CLL012	CLL012-0305A5	○	○	○	○	○	○					
CLL020 CLL022	CLL022-1202A5	○	○	○	○	○	○					
	CLL022-1203A5	○	○	○	○	○	○					
	CLL022-1204A5	○	○	○	○	○	○					
	CLL020-1202A5							○	○	○	○	○
	CLL020-1203A5							○	○	○	○	○
	CLL020-1204A5							○	○	○	○	○
CLL030 CLL032	CLL032-1205A5	○	○	○	○	○	○					
	CLL032-1206A5	○	○	○	○	○	○					
	CLL032-1208A5	○	○	○	○	○	○					
	CLL032-1212A5	○	○	○	○	○	○					
	CLL030-1205A5							○	○	○	○	○
	CLL030-1206A5							○	○	○	○	○
	CLL030-1208A5							○	○	○	○	○
	CLL030-1212A5							○	○	○	○	○
CLL040 CLL042	CLL042-1218A5	○	○	○	○	○	○					
	CLL042-1818A5	○	○	○	○	○	○					
	CLL040-1218A5							○	○	○	○	○
	CLL040-1818A5							○	○	○	○	○
CLL050 CLL052	CLL052-1825A5			○	○	○	○					
	CLL050-1825A5	○	○									
CL-L104	CL-L104 (3W)	○	○	○	○	○	○	○	○	○	○	○
	CL-L104 (6W)	○	○	○	○	○	○	○	○	○	○	○



Outline Drawings

Series	Appearance (Actual size)	Outline drawing
<p>CLL012</p>	 <p>9.5×9.5 mm</p>	 <p>Unit:mm</p>
<p>CLL020 CLL022</p>	 <p>13.5×13.5 mm</p>	 <p>Unit:mm</p>
<p>CLL030 CLL032</p>	 <p>19.0×19.0 mm</p>	 <p>Unit:mm</p>
<p>CLL040 CLL042</p>	 <p>28.0×28.0 mm</p>	 <p>Unit:mm</p>
<p>CLL050 CLL052</p>	 <p>38.0×38.0 mm</p>	 <p>Unit:mm</p>



Series	Appearance (Actual size)	Outline drawing
CL-L104	 <p data-bbox="454 631 686 660">50.0×7.0×1.35 mm</p>	 <p data-bbox="1380 638 1460 660">Unit:mm</p>

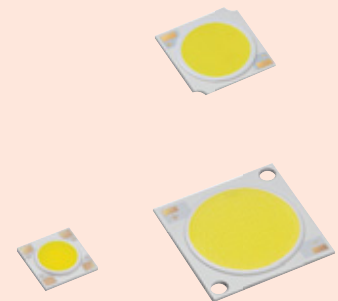
COB High-wattage Series

## Structure of Product Code

CLL012, CLL020, CLL022, CLL030, CLL032,  
CLL040, CLL042, CLL050, CLL052

### CLL012-0305A5-50KL1A1

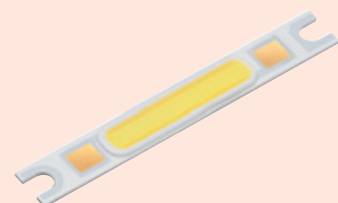
- Part Code
- Dies in series quantity  
03:3
- Dies in parallel quantity  
05:5
- Correlated color temperature  
50:5,000K

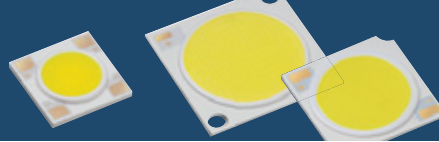


### CL-L104

### CL-L104-MC3L1-F5

- Series
- Color rendering  
M: Ra80 Min.
- Wattage class  
C3:3 watt class
- Correlated color temperature  
L1:3,000K





Product List

(Tc = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance Rj-c (°C/W)	Pd (W)	Forward current (mA)
CLL012	CLL012-0305A5-503M1A2	5,000K	335	123	80 Min.	300	9.06	2.7	5.5	6.7	600
	CLL012-0305A5-403M1A2	4,000K	330	121							
	CLL012-0305A5-353M1A2	3,500K	325	120							
	CLL012-0305A5-303M1A2	3,000K	315	116							
	CLL012-0305A5-273M1A2	2,700K	295	109							
	CLL012-0305A5-50KL1A1	5,000K	385	142	65 Typ.						

(Tc = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance Rj-c (°C/W)	Pd (W)	Forward current (mA)
CLL020 CLL022	CLL020-1202A5-503H1A7	5,000K	430	99	90 Min.						
	CLL020-1202A5-403H1A7	4,000K	420	97							
	CLL020-1202A5-353H1A7	3,500K	410	94							
	CLL020-1202A5-303H1A7	3,000K	385	89							
	CLL020-1202A5-273H1A7	2,700K	360	83							
	CLL022-1202A5-503M1A2	5,000K	570	131	80 Min.	120	36.2	4.3	3.7	10.7	240
	CLL022-1202A5-403M1A2	4,000K	560	129							
	CLL022-1202A5-353M1A2	3,500K	555	128							
	CLL022-1202A5-303M1A2	3,000K	535	123							
	CLL022-1202A5-273M1A2	2,700K	505	116							
	CLL022-1202A5-50KL1A1	5,000K	655	151	65 Typ.						
	CLL020-1203A5-503H1A7	5,000K	625	96	90 Min.						
	CLL020-1203A5-403H1A7	4,000K	620	95							
	CLL020-1203A5-353H1A7	3,500K	605	93							
	CLL020-1203A5-303H1A7	3,000K	565	87							
	CLL020-1203A5-273H1A7	2,700K	530	81							
	CLL022-1203A5-503M1A2	5,000K	830	127	80 Min.	180	36.2	6.5	2.6	16.1	360
	CLL022-1203A5-403M1A2	4,000K	820	126							
	CLL022-1203A5-353M1A2	3,500K	815	125							
	CLL022-1203A5-303M1A2	3,000K	785	120							
	CLL022-1203A5-273M1A2	2,700K	735	113							
	CLL022-1203A5-50KL1A1	5,000K	960	147	65 Typ.						
	CLL020-1204A5-503H1A7	5,000K	835	96	90 Min.						
	CLL020-1204A5-403H1A7	4,000K	820	94							
	CLL020-1204A5-353H1A7	3,500K	790	91							
	CLL020-1204A5-303H1A7	3,000K	745	86							
	CLL020-1204A5-273H1A7	2,700K	700	81							
	CLL022-1204A5-503M1A2	5,000K	1,095	126	80 Min.	240	36.2	8.7	2.1	21.5	480
	CLL022-1204A5-403M1A2	4,000K	1,085	125							
	CLL022-1204A5-353M1A2	3,500K	1,070	123							
CLL022-1204A5-303M1A2	3,000K	1,030	118								
CLL022-1204A5-273M1A2	2,700K	975	112								
CLL022-1204A5-50KL1A1	5,000K	1,270	146	65 Typ.							

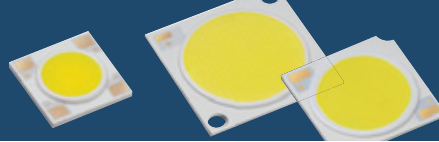


Visit our website to find the best product solutions of COB high-wattage LEDs that meet your application.  
[http://ce.citizen.co.jp/lighting\\_led/jp/products/COB\\_series.html](http://ce.citizen.co.jp/lighting_led/jp/products/COB_series.html)

(Tc = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance Rj-c (°C/W)	Pd (W)	Forward current (mA)
CLL030 CLL032	CLL030-1205A5-503H1A7	5,000K	1,070	99	90 Min.						
	CLL030-1205A5-403H1A7	4,000K	1,050	97							
	CLL030-1205A5-353H1A7	3,500K	1,020	94							
	CLL030-1205A5-303H1A7	3,000K	965	89							
	CLL030-1205A5-273H1A7	2,700K	900	83							
	CLL032-1205A5-503M1A2	5,000K	1,410	130	80 Min.	300	36.2	10.9	1.7	26.8	600
	CLL032-1205A5-403M1A2	4,000K	1,390	128							
	CLL032-1205A5-353M1A2	3,500K	1,380	127							
	CLL032-1205A5-303M1A2	3,000K	1,335	123							
	CLL032-1205A5-273M1A2	2,700K	1,260	116							
	CLL032-1205A5-50KL1A1	5,000K	1,635	150	65 Typ.						
	CLL030-1206A5-503H1A7	5,000K	1,270	97	90 Min.						
	CLL030-1206A5-403H1A7	4,000K	1,250	96							
	CLL030-1206A5-353H1A7	3,500K	1,210	93							
	CLL030-1206A5-303H1A7	3,000K	1,145	88							
	CLL030-1206A5-273H1A7	2,700K	1,065	82							
	CLL032-1206A5-503M1A2	5,000K	1,670	128	80 Min.	360	36.2	13.0	1.5	32.2	720
	CLL032-1206A5-403M1A2	4,000K	1,655	127							
	CLL032-1206A5-353M1A2	3,500K	1,635	125							
	CLL032-1206A5-303M1A2	3,000K	1,585	121							
	CLL032-1206A5-273M1A2	2,700K	1,490	114							
	CLL032-1206A5-50KL1A1	5,000K	1,940	149	65 Typ.						
	CLL030-1208A5-503H1A7	5,000K	1,680	97	90 Min.						
	CLL030-1208A5-403H1A7	4,000K	1,655	95							
	CLL030-1208A5-353H1A7	3,500K	1,600	92							
	CLL030-1208A5-303H1A7	3,000K	1,515	87							
	CLL030-1208A5-273H1A7	2,700K	1,410	81							
	CLL032-1208A5-503M1A2	5,000K	2,215	127	80 Min.	480	36.2	17.4	1.2	42.9	960
	CLL032-1208A5-403M1A2	4,000K	2,190	126							
	CLL032-1208A5-353M1A2	3,500K	2,165	124							
	CLL032-1208A5-303M1A2	3,000K	2,095	120							
	CLL032-1208A5-273M1A2	2,700K	1,970	113							
CLL032-1208A5-50KL1A1	5,000K	2,565	147	65 Typ.							
CLL030-1212A5-503H1A7	5,000K	2,435	93	90 Min.							
CLL030-1212A5-403H1A7	4,000K	2,400	92								
CLL030-1212A5-353H1A7	3,500K	2,325	89								
CLL030-1212A5-303H1A7	3,000K	2,190	84								
CLL030-1212A5-273H1A7	2,700K	2,045	78								
CLL032-1212A5-503M1A2	5,000K	3,205	123	80 Min.	720	36.2	26.1	0.8	64.4	1,440	
CLL032-1212A5-403M1A2	4,000K	3,170	121								
CLL032-1212A5-353M1A2	3,500K	3,140	120								
CLL032-1212A5-303M1A2	3,000K	3,035	116								
CLL032-1212A5-273M1A2	2,700K	2,860	110								
CLL032-1212A5-50KL1A1	5,000K	3,715	142	65 Typ.							

\*Product names and specifications in this catalog are subject to change without notice for the purpose of improvement, or manufacturing may be discontinued. When electing to use a product, please be sure to request specifications information along with a delivery schedule.



(T<sub>c</sub> = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance R <sub>j-c</sub> (°C/W)	P <sub>D</sub> (W)	Forward current (mA)
<b>CLL040</b> <b>CLL042</b>	CLL040-1218A5-503H1A7	5,000K	3,820	98	90 Min.						
	CLL040-1218A5-403H1A7	4,000K	3,760	96							
	CLL040-1218A5-353H1A7	3,500K	3,645	93							
	CLL040-1218A5-303H1A7	3,000K	3,435	88							
	CLL040-1218A5-273H1A7	2,700K	3,205	82							
	CLL042-1218A5-503M1A2	5,000K	5,030	129	80 Min.	1,080	36.2	39.1	0.6	96.6	2,160
	CLL042-1218A5-403M1A2	4,000K	4,980	127							
	CLL042-1218A5-353M1A2	3,500K	4,925	126							
	CLL042-1218A5-303M1A2	3,000K	4,755	121							
	CLL042-1218A5-273M1A2	2,700K	4,480	114							
	CLL042-1218A5-50KL1A1	5,000K	5,830	149	65 Typ.						
	CLL040-1818A5-503H1A7	5,000K	5,445	93	90 Min.						
	CLL040-1818A5-403H1A7	4,000K	5,360	91							
	CLL040-1818A5-353H1A7	3,500K	5,195	88							
	CLL040-1818A5-303H1A7	3,000K	4,900	83							
	CLL040-1818A5-273H1A7	2,700K	4,565	78							
	CLL042-1818A5-503M1A2	5,000K	7,170	122	80 Min.	1,080	54.4	58.8	0.4	144.9	2,160
	CLL042-1818A5-403M1A2	4,000K	7,090	121							
	CLL042-1818A5-353M1A2	3,500K	7,015	119							
	CLL042-1818A5-303M1A2	3,000K	6,775	115							
CLL042-1818A5-273M1A2	2,700K	6,390	109								
CLL042-1818A5-50KL1A1	5,000K	8,310	142	65 Typ.							

(T<sub>c</sub> = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance R <sub>j-c</sub> (°C/W)	P <sub>D</sub> (W)	Forward current (mA)
<b>CLL050</b> <b>CLL052</b>	CLL050-1825A1-503M1A2	5,000K	8,460	103	80 Min.	1,500	54.9	82.4	0.3	200.5	3,000
	CLL052-1825B1-403M1A2	4,000K	10,850	137							
	CLL052-1825B1-353M1A2	3,500K	10,735	136							
	CLL052-1825B1-303M1A2	3,000K	10,385	131							
	CLL052-1825B1-273M1A2	2,700K	9,785	124							
	CLL050-1825A1-50KL1A1	5,000K	9,890	120	65 Typ.		54.9	82.4	0.3	200.5	



Visit our website to find the best product solutions of COB high-wattage LEDs that meet your application.  
[http://ce.citizen.co.jp/lighting\\_led/jp/products/COB\\_series.html](http://ce.citizen.co.jp/lighting_led/jp/products/COB_series.html)

(T<sub>c</sub> = 25°C)

Series	Product code	Electro-optical Characteristics								Absolute Maximum Rating	
		CCT	Luminous flux Typ. (lm)	Luminous efficacy Typ. (lm/W)	Ra	Forward current (mA)	Voltage Typ. (V)	Input power Typ. (W)	Thermal resistance R <sub>j-c</sub> (°C/W)	P <sub>D</sub> (W)	Forward current (mA)
CL-L104 (3W)	CL-L104-HC3N1-F5	5,000K	280	87.0	90 Min.						
	CL-L104-HC3W1-F5	4,000K	275	85.4							
	CL-L104-HC3WW1-F5	3,500K	265	82.3							
	CL-L104-HC3L1-F5	3,000K	260	80.7							
	CL-L104-HC3L2-F5	2,700K	250	77.6							
	CL-L104-MC3N1-F5	5,000K	325	100.9	80 Min.	350	9.2	3.22	6.4	7.5	720
	CL-L104-MC3W1-F5	4,000K	320	99.4							
	CL-L104-MC3WW1-F5	3,500K	315	97.8							
	CL-L104-MC3L1-F5	3,000K	305	94.7							
	CL-L104-MC3L2-F5	2,700K	295	91.6							
CL-L104-C3N-F	5,000K	385	119.6	65 Typ.							
CL-L104 (6W)	CL-L104-HC6N1-F5	5,000K	565	87.7	90 Min.						
	CL-L104-HC6W1-F5	4,000K	550	85.4							
	CL-L104-HC6WW1-F5	3,500K	530	82.3							
	CL-L104-HC6L1-F5	3,000K	520	80.7							
	CL-L104-HC6L2-F5	2,700K	500	77.6							
	CL-L104-MC6N1-F5	5,000K	650	100.9	80 Min.	700	9.2	6.44	5.0	15.0	1,440
	CL-L104-MC6W1-F5	4,000K	640	99.4							
	CL-L104-MC6WW1-F5	3,500K	630	97.8							
	CL-L104-MC6L1-F5	3,000K	610	94.7							
	CL-L104-MC6L2-F5	2,700K	595	92.4							
CL-L104-C6N-F	5,000K	760	118.0	65 Typ.							

\*Product names and specifications in this catalog are subject to change without notice for the purpose of improvement, or manufacturing may be discontinued. When electing to use a product, please be sure to request specifications information along with a delivery schedule.

