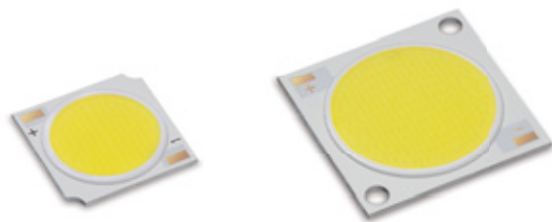


More light with less power !



# ***New COB Series***

Lighting Design with CITILED



CITIZEN ELECTRONICS CO. meets our customers' needs by utilizing our original packaging technology and providing various products characterized by high output, high efficacy, and high color rendering.

**CITILED**<sup>®</sup>  
The Light Engine













# New COB\* Series provides a wide range of luminous flux

\* COB: Chip on board

## Features

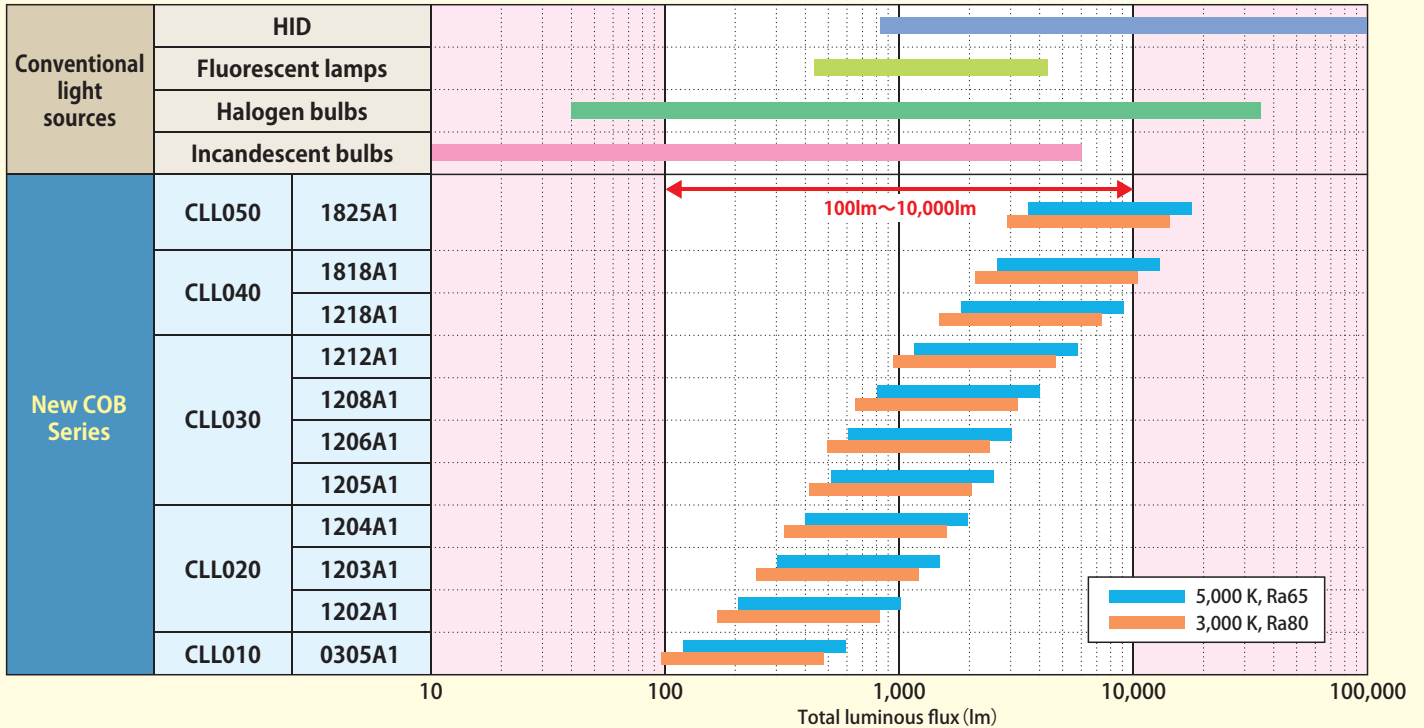
- 155 lm/W (5,000K, Ra65) and 125 lm/W (3,000K, Ra80) are achieved through application of latest LED technology.
- New COB Series covers a range of luminous flux, from one produced by a 10W incandescent bulb to one produced by a 300W mercury lamp, both of which are conventional light sources.
- It is possible to set up highly-flexible LED drive conditions due to the products covering a wide range of luminous flux.
- Low thermal resistance products are achieved by adopting our unique COB structure.
- The products have reduced variation in the chromaticity range and they are compliant with 3-step MacAdam.
- Adopted element arrangement is capable of utilizing light more effectively.

## New COB Series (11 models / 5 packages)

Series	CLL010	CLL020	CLL030	CLL040	CLL050		
Type	CLL010-0305A1	CLL020-1202A1 CLL020-1203A1 CLL020-1204A1	CLL030-1205A1 CLL030-1206A1 CLL030-1208A1 CLL030-1212A1	CLL040-1218A1 CLL040-1818A1	CLL050-1825A1		
Shape							
Size (mm)	9.5×9.5×1.4	13.5×13.5×1.4	19.0×19.0×1.4	28.0×28.0×1.4	38.0×38.0×1.4		
Color lineup	●High color rendering type: 2,700K, 3,000K, 3,500K, 4,000K, 5,000K (MacAdam 3-Step) ●High efficacy type: 5,000K						
Drive (W)	0.8~6.1	1.3~19.6	3.3~58.9	11.8~132.4	24.6~183.9		
Maximum rating (W)	6.7	10.7~21.4	26.7~64.2	96.2~144.3	200.5		
Total luminous flux (lm)	95~590	165~1,970	415~5,780	1,480~12,915	2,885~17,675		
Applications	MR-16 Bulb 	A19 Bulb 	Bulb PAR30 	Downlight 	High Bay Light 	Floodlight 	Outdoor Lighting 

## Variations in luminous flux

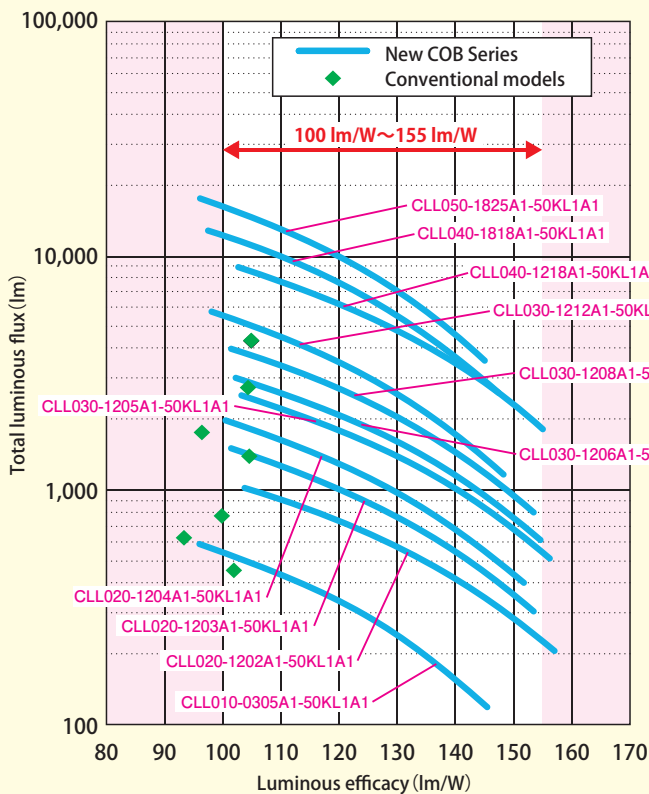
### "Luminous flux" range



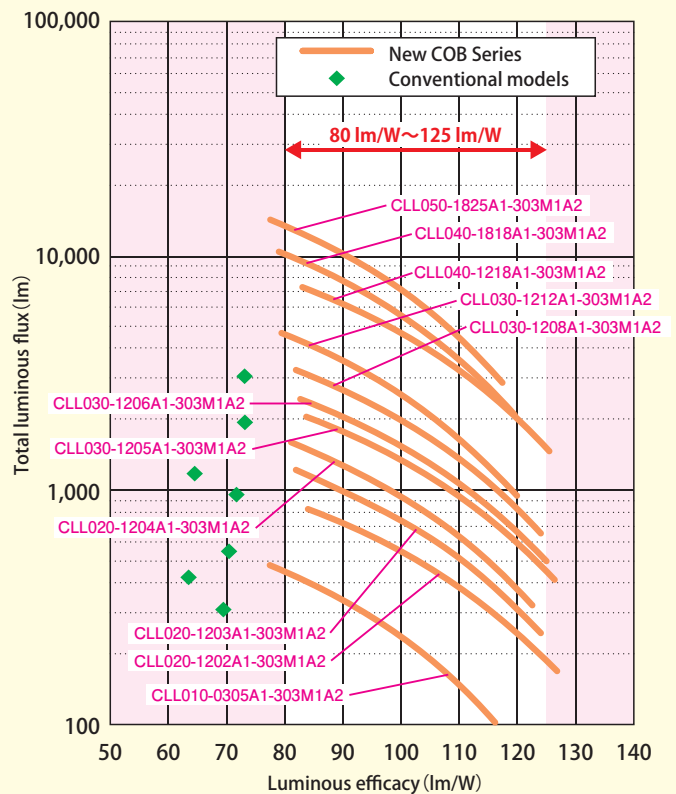
## Variations in total luminous flux and luminous efficacy

It is possible to select products from flexible drive conditions depending on applications.


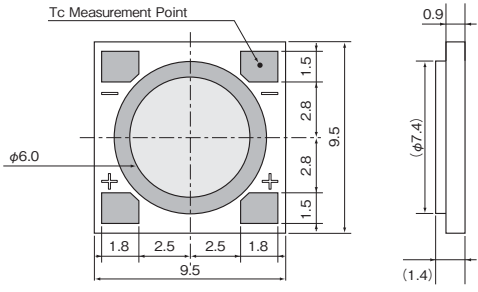

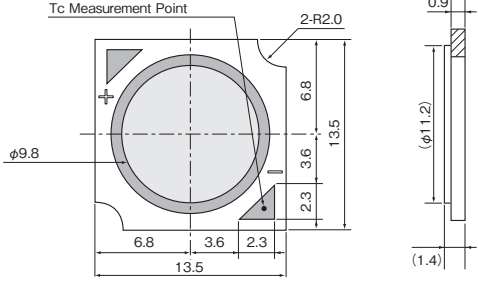

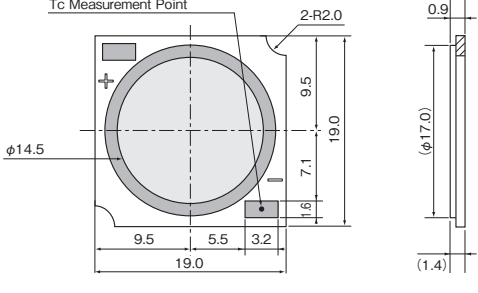

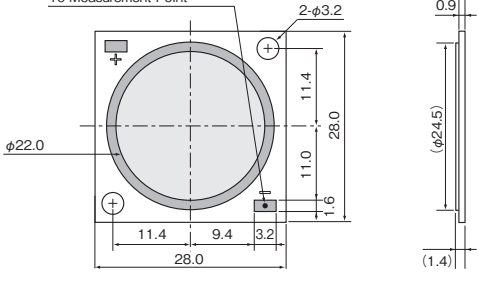

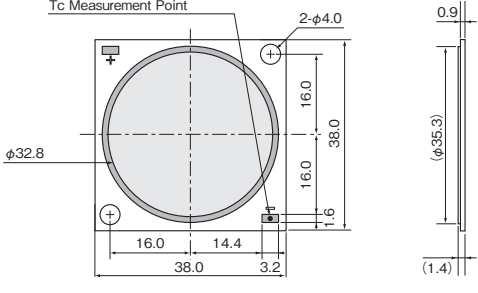
### Luminous efficacy vs. total luminous flux at 5,000K and Ra65



### Luminous efficacy vs. total luminous flux at 3,000K and Ra80



# Size/ Outline drawing

Series	Actual size	Outline drawing
<p style="text-align: center;"><b>CLL010</b></p>	 <p style="text-align: center;">9.5×9.5 mm</p>	 <p style="text-align: right;">Unit:mm</p>
<p style="text-align: center;"><b>CLL020</b></p>	 <p style="text-align: center;">13.5×13.5 mm</p>	 <p style="text-align: right;">Unit:mm</p>
<p style="text-align: center;"><b>CLL030</b></p>	 <p style="text-align: center;">19.0×19.0 mm</p>	 <p style="text-align: right;">Unit:mm</p>
<p style="text-align: center;"><b>CLL040</b></p>	 <p style="text-align: center;">28.0×28.0 mm</p>	 <p style="text-align: right;">Unit:mm</p>
<p style="text-align: center;"><b>CLL050</b></p>	 <p style="text-align: center;">38.0×38.0 mm</p>	 <p style="text-align: right;">Unit:mm</p>

# CCT 3,000K Ra 80 min

## Specifications

Series	Product code	Condition I <sub>F</sub> [mA]	Electro-optical Characteristics				Absolute Maximum Rating	
			Luminous flux φ <sub>v</sub> [lm]	Luminous efficacy [lm/W]	Forward voltage V <sub>F</sub> [V]	Thermal resistance R <sub>j-c</sub> [C/W]	Input power P <sub>i</sub> [W]	Forward current I <sub>F</sub> [mA]
CLL010	CLL010-0305A1-303M1A2	100	95	116	8.2	5.5	6.7	600
		300	265	97	9.1			
		600	475	77	10.2			
CLL020	CLL020-1202A1-303M1A2	40	165	126	32.8	3.7	10.7	240
		120	460	105	36.6			
		240	825	84	40.9			
	CLL020-1203A1-303M1A2	60	245	125	32.8	2.6	16	360
		180	675	102	36.6			
		360	1,210	82	40.9			
	CLL020-1204A1-303M1A2	80	320	122	32.8	2.1	21.4	480
		240	890	101	36.6			
		480	1,595	81	40.9			
CLL030	CLL030-1205A1-303M1A2	100	415	127	32.8	1.7	26.7	600
		300	1,150	105	36.6			
		600	2,050	84	40.9			
	CLL030-1206A1-303M1A2	120	490	125	32.8	1.5	32.1	720
		360	1,365	104	36.6			
		720	2,435	83	40.9			
	CLL030-1208A1-303M1A2	160	650	124	32.8	1.2	42.8	960
		480	1,805	103	36.6			
		960	3,225	82	40.9			
CLL030-1212A1-303M1A2	240	945	120	32.8	0.8	64.2	1,440	
	720	2,615	99	36.6				
	1,440	4,670	79	40.9				
CLL040	CLL040-1218A1-303M1A2	360	1,480	125	32.8	0.6	96.2	2,160
		1,080	4,100	104	36.6			
		2,160	7,330	83	40.9			
	CLL040-1818A1-303M1A2	360	2,110	119	49.2	0.4	144.3	2,160
		1,080	5,845	99	54.9			
		2,160	10,440	79	61.3			
CLL050	CLL050-1825A1-303M1A2	500	2,885	117	49.2	0.3	200.5	3,000
		1,500	7,995	97	54.9			
		3,000	14,290	78	61.3			

# CCT 5,000K Ra 80 min

## Specifications

Series	Product code	Condition	Electro-optical Characteristics				Absolute Maximum Rating	
			Luminous flux	Luminous efficacy	Forward voltage	Thermal resistance	Input power	Forward current
			$I_F$ [mA]	$\phi_v$ [lm]	[lm/W]	$V_F$ [V]	$R_{j-c}$ [C/W]	$P_i$ [W]
CLL010	CLL010-0305A1-503M1A2	100	100	122	8.2	5.5	6.7	600
		300	280	102	9.1			
		600	505	82	10.2			
CLL020	CLL020-1202A1-503M1A2	40	175	133	32.8	3.7	10.7	240
		120	490	112	36.6			
		240	870	89	40.9			
	CLL020-1203A1-503M1A2	60	260	132	32.8	2.6	16	360
		180	715	109	36.6			
		360	1,280	87	40.9			
	CLL020-1204A1-503M1A2	80	340	130	32.8	2.1	21.4	480
		240	945	108	36.6			
		480	1,685	86	40.9			
CLL030	CLL030-1205A1-503M1A2	100	440	134	32.8	1.7	26.7	600
		300	1,215	111	36.6			
		600	2,170	88	40.9			
	CLL030-1206A1-503M1A2	120	520	132	32.8	1.5	32.1	720
		360	1,440	109	36.6			
		720	2,580	88	40.9			
	CLL030-1208A1-503M1A2	160	690	132	32.8	1.2	42.8	960
		480	1,910	109	36.6			
		960	3,410	87	40.9			
CLL030-1212A1-503M1A2	240	1,000	127	32.8	0.8	64.2	1,440	
	720	2,765	105	36.6				
	1,440	4,940	84	40.9				
CLL040	CLL040-1218A1-503M1A2	360	1,565	133	32.8	0.6	96.2	2,160
		1,080	4,340	110	36.6			
		2,160	7,755	88	40.9			
	CLL040-1818A1-503M1A2	360	2,230	126	49.2	0.4	144.3	2,160
		1,080	6,180	104	54.9			
		2,160	11,045	83	61.3			
CLL050	CLL050-1825A1-503M1A2	500	3,055	124	49.2	0.3	200.5	3,000
		1,500	8,460	103	54.9			
		3,000	15,120	82	61.3			

# CCT 5,000K Ra 65 typ

## Specifications

Series	Product code	Condition	Electro-optical Characteristics				Absolute Maximum Rating	
			Luminous flux	Luminous efficacy	Forward voltage	Thermal resistance	Input power	Forward current
		$I_F$ [mA]	$\phi_v$ [lm]	[lm/W]	$V_F$ [V]	$R_{j-c}$ [C/W]	$P_i$ [W]	$I_F$ [mA]
CLL010	CLL010-0305A1-50KL1A1	100	120	146	8.2	5.5	6.7	600
		300	330	120	9.1			
		600	590	96	10.2			
CLL020	CLL020-1202A1-50KL1A1	40	205	156	32.8	3.7	10.7	240
		120	570	130	36.6			
		240	1,020	104	40.9			
	CLL020-1203A1-50KL1A1	60	300	153	32.8	2.6	16	360
		180	835	127	36.6			
		360	1,495	102	40.9			
	CLL020-1204A1-50KL1A1	80	400	153	32.8	2.1	21.4	480
		240	1,105	126	36.6			
		480	1,970	100	40.9			
CLL030	CLL030-1205A1-50KL1A1	100	515	157	32.8	1.7	26.7	600
		300	1,420	129	36.6			
		600	2,540	104	40.9			
	CLL030-1206A1-50KL1A1	120	610	155	32.8	1.5	32.1	720
		360	1,685	128	36.6			
		720	3,015	102	40.9			
	CLL030-1208A1-50KL1A1	160	805	153	32.8	1.2	42.8	960
		480	2,230	127	36.6			
		960	3,990	102	40.9			
CLL030-1212A1-50KL1A1	240	1,165	148	32.8	0.8	64.2	1,440	
	720	3,235	123	36.6				
	1,440	5,780	98	40.9				
CLL040	CLL040-1218A1-50KL1A1	360	1,830	155	32.8	0.6	96.2	2,160
		1,080	5,070	128	36.6			
		2,160	9,065	103	40.9			
	CLL040-1818A1-50KL1A1	360	2,610	147	49.2	0.4	144.3	2,160
		1,080	7,225	122	54.9			
		2,160	12,915	98	61.3			
CLL050	CLL050-1825A1-50KL1A1	500	3,570	145	49.2	0.3	200.5	3,000
		1,500	9,890	120	54.9			
		3,000	17,675	96	61.3			

- A luminous flux simulator is provided on our website.
- The models are available in 2,700K, 3,500K and 4,000K.
- When the products are driven under conditions other than those stated above, the specifications are for reference only.



## Notes

- The products in this catalog comply with RoHS directives.
- 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 a delivery and specifications manual and check the contents.
- The information contained in this catalog guarantees the characteristics and quality of the product unit. When electing to use a product, be sure to evaluate and check the applied product in its mounted condition.
- Problems arising as a result of use that deviates from the characteristics, ratings, or scope of use described in this catalog will not be covered by warranty.
- The products in this catalog are intended for use in general electronic equipment. When considering application in equipment or devices for which a high degree of reliability is required and for which irregularities of the product could have direct consequences on human life, please discuss the matter in advance with our sales representative.
- All efforts have been made toward the improvement of product quality and reliability; however, there is the possibility that improper methods of use could give rise to bodily injury, fire accidents, and social loss. Should there be anything unclear about the method of use, please contact our sales representative.
- When, as a result of using the product in this catalog, a problem arises relating to the industrial property of third parties, our company will not assume responsibility for matters other than those concerned with the construction and manufacturing methods of our company's products.

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