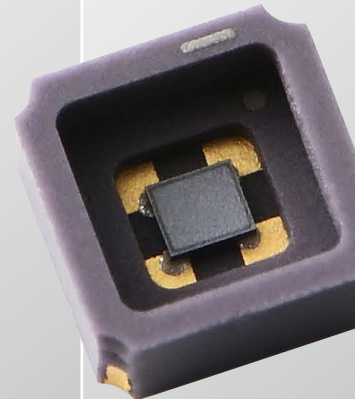
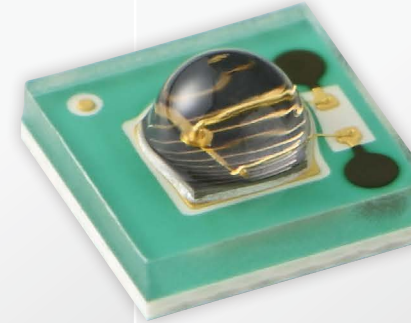
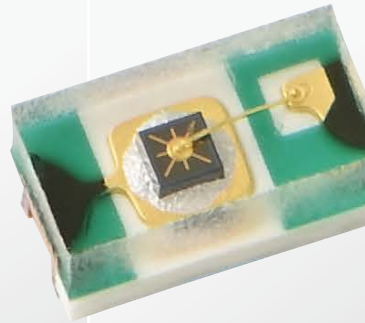


Rich variety of light emitters  
for wide range of applications

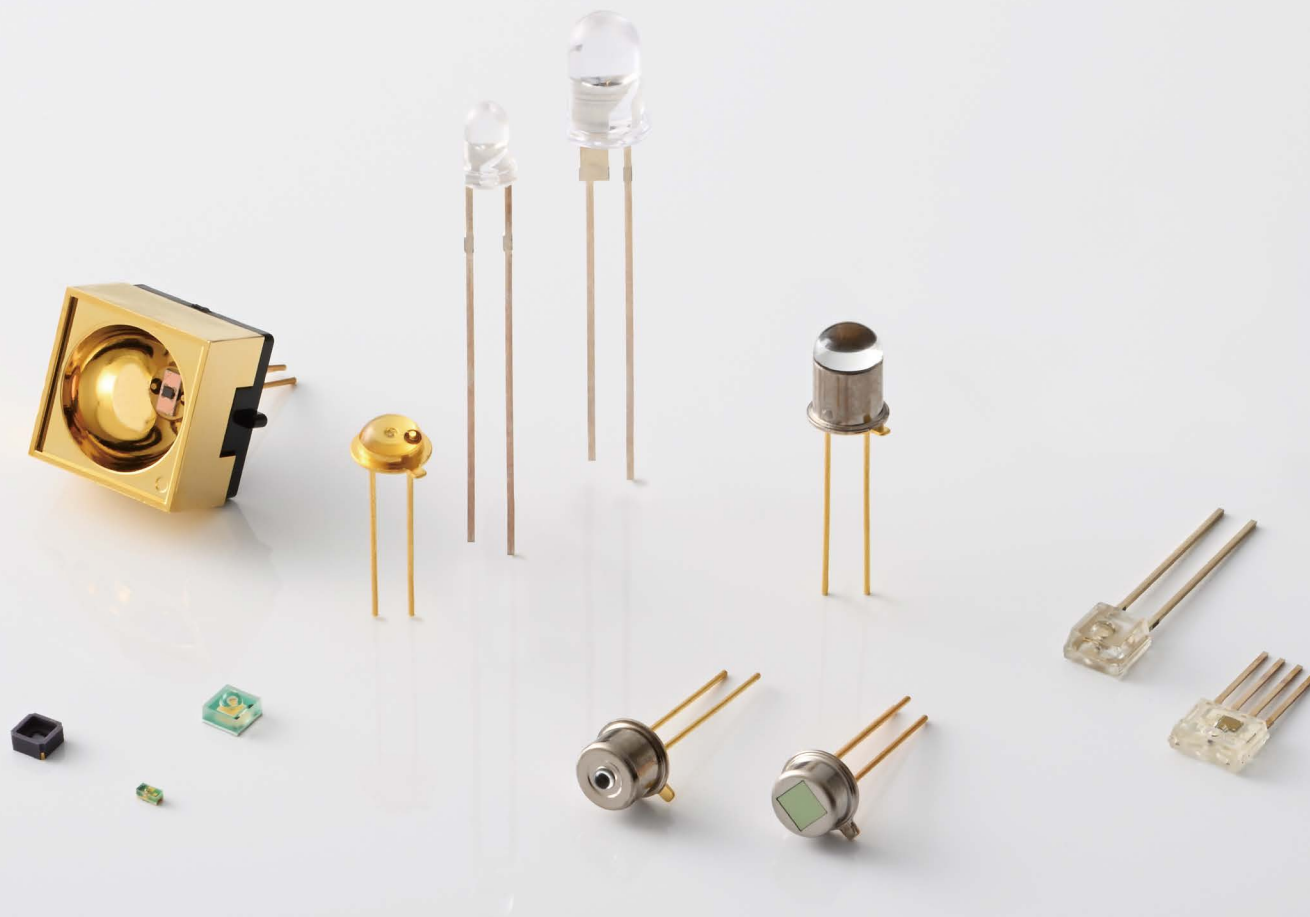
# LED



## Rich variety of light emitters for wide range of applications

Hamamatsu provides various LEDs from red to mid-infrared range, which are mainly used in combination with a photosensor.

By using crystal growth technology and process technology for a variety of compound semiconductor materials, we have a product lineup for a variety of wavelengths. We also achieve high quality and high reliability through strictly controlled assembly and inspection processes.



# Hamamatsu LEDs

● Product lineup that covers a wide variety of wavelengths

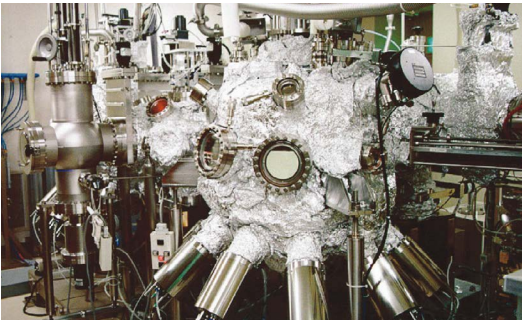
Type	Peak emission wavelength	Main applications
<a href="#">Red LED</a>	650 to 700 nm	Optical switches, POF data communication, barcode readers
<a href="#">Near-infrared LED</a>	830 to 945 nm	Optical encoders, optical fiber communication, FSO, optical switches
	1.2 to 1.55 μm	Moisture measurement, analysis, near-infrared lighting
<a href="#">Mid-infrared LED</a>	3.3 to 4.3 μm	Gas detection
<a href="#">SIP type LED</a>	650 to 940 nm	Optical links, optical switches, encoders

● Variety of package types

Package	Features
Metal	High reliability
Plastic	Low price
Surface mount type	Compact, thin type
With lens	Narrow directivity
High output	High heat radiation

● Custom devices available

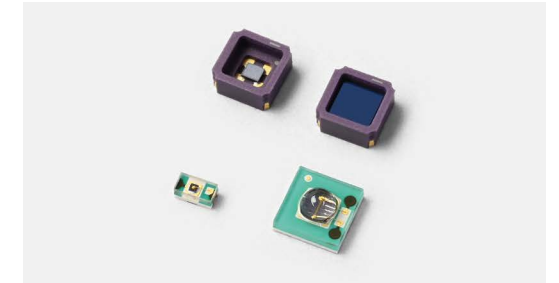
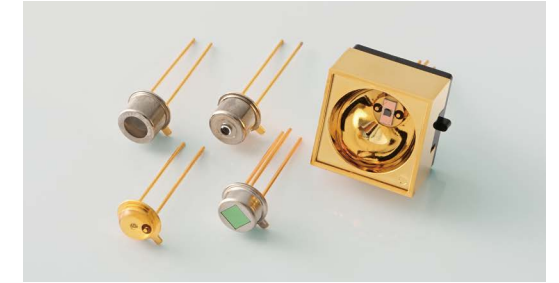
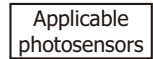
In addition to package and lens design, and multi-element array, we can also support custom specifications, such as wavelength changes that require new epitaxial wafer crystal growth.



Thin-film crystal growth under ultra-high vacuum in MBE equipment

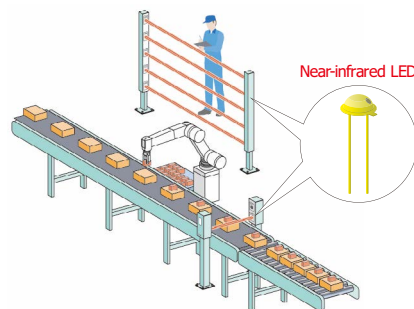


Thin-film crystal growth with MOCVD equipment



# Application examples

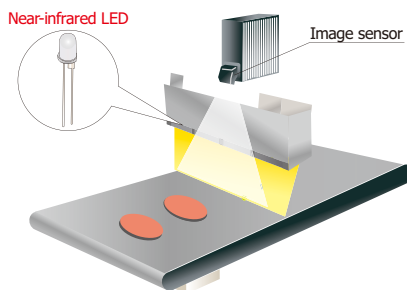
## Optical sensors



KLEDC0066EA

Near-infrared LEDs are used for non-contact product passage detection and safety light curtains, etc.

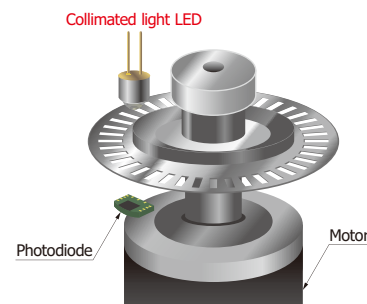
## Lighting for infrared cameras



KLEDC0056EA

Infrared LEDs with high output are used as light sources for infrared camera imaging. These LEDs are arranged around the camera.

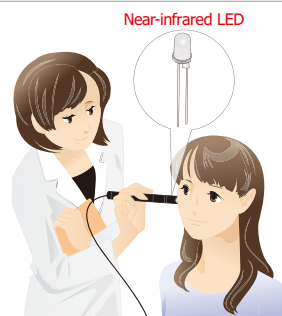
## Encoders



KLEDC0054EA

Optical transmission encoders require a collimated LED to achieve high accuracy.

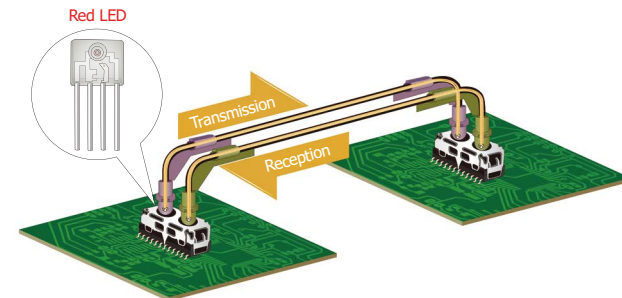
## Skin moisture measurement



KLEDC0057EA

Compact near-infrared LEDs are used for measuring skin moisture levels.

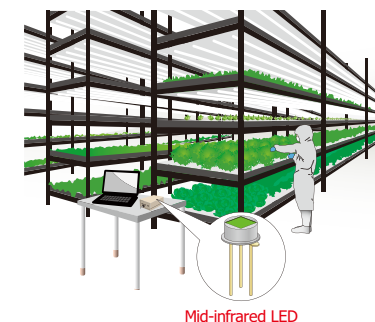
## Optical communication



KLEDC0055EA

Red LEDs are used for POF (plastic optical fiber) communications and FSO (free space optics).

## Gas detection











KLEDC0058EB

Mid-infrared LEDs are used for CO<sub>2</sub> density measurements in plant factories.

Red LEDs

Red LEDs have a peak emission wavelength in the 660 to 700 nm range. They are used in a wide range of applications including optical switches, POF data communication, and barcode readers.

(Typ. Ta=25 °C)

Type no.	Peak emission wavelength (nm)	Spectral half width (nm)	Emitter area (mm)	Radiant flux (mW)	Forward voltage (V)	Cutoff frequency (MHz)	Measurement condition	Photo	Directivity	Features	Application examples
							Forward current (mA)				
<a href="#">L10762</a>	660	15	φ0.4	1.0*	1.9	70	20		<a href="#">⑧</a>	High fiber end output	POF data communication
<a href="#">L11767</a>		18	□0.31	13	2.1	6			<a href="#">①</a>	High output, wide directivity	Optical switches
<a href="#">L11767-0066L</a>			φ4.65	7					<a href="#">⑤</a>	High reliability, narrow directivity	
<a href="#">L6108</a>	670	25	□0.25	5.5	1.8	5	20		<a href="#">①</a>	High output, wide directivity	Optical switches
<a href="#">L6112</a>			φ1.15						<a href="#">②</a>	High output	
<a href="#">L6112-01</a>			φ4.65	2.5					<a href="#">⑤</a>	High reliability, narrow directivity	
<a href="#">L6112-02</a>			φ1.15						<a href="#">③</a>	High reliability, wide directivity	
<a href="#">L10363</a>	700	20	φ4.65	1.4	1.7	5	20		<a href="#">⑤</a>	High reliability, narrow directivity	Optical switches









\* POF core diameter=φ1 mm, length=1 m, Z (distance between the top surface of the cap and the fiber end)=0.3 mm



830 to 945 nm

These near-infrared LEDs have a peak emission wavelength in the 830 to 945 nm range. They are used in a wide range of applications including optical switches, optical fiber communication, near-infrared lighting, and encoders.

(Typ. Ta=25 °C)

Type no.	Peak emission wavelength (nm)	Spectral half width (nm)	Emitter area (mm)	Radiant flux (mW)	Forward voltage (V)	Cutoff frequency (MHz)	Measurement condition	Photo	Directivity	Features	Application examples
							Forward current (mA)				
<a href="#">L11913</a>	850	25	φ4.65	3.4*1	1.45	20	20		<a href="#">⑥</a>	High reliability, superior collimation	Encoders
<a href="#">L13141-0085K</a>		30	φ0.11	2.8	1.7	25	50		<a href="#">⑦</a>	Wide directivity, current confinement type	Optical switches
<a href="#">L13142-0085K</a>		35	φ0.4	3					<a href="#">⑧</a>	Narrow directivity, current confinement type	
<a href="#">L13142-0085L</a>		30	φ4.65						<a href="#">⑥</a>		
<a href="#">L14096-0085GL</a>		25	φ1.4	23	1.9	20			<a href="#">⑬</a>	High output, narrow directivity	
<a href="#">L11368-01</a>	870	35	φ1.7	65 μW*2	2	50	50		<a href="#">④</a>	Current confinement type	Optical communication
<a href="#">L14097-0094GL</a>	940	40	φ1.4	60	2.5	10	50		<a href="#">⑭</a>	Large current, high output	Near-infrared lighting
				1200	3.0		1000*3				
<a href="#">L9338</a>	945	60	φ0.75	15	1.34	0.3	50		<a href="#">②</a>	High output	Optical switches

\*1: Light output   \*2: GI50 fiber end output   \*3: Pulse value=10 μs, duty ratio=1 %

1.2 to 1.55 μm

These high output near-infrared LEDs have a peak emission wavelength at 1 μm or higher. 1.2 μm, 1.3 μm, 1.45 μm, and 1.55 μm peak emission wavelength types are available. They are used for analysis, near-infrared lighting, etc.

(Typ. Ta=25 °C)









Type no.	Peak emission wavelength (nm)	Spectral half width (nm)	Emitter area (mm)	Radiant flux (mW)	Forward voltage (V)	Cutoff frequency (MHz)	Measurement condition	Photo	Directivity	Features	Application examples
							Forward current (mA)				
<a href="#">L13072-0120K</a>	1200	80	φ1.15	2.2	1.1	15	50		<a href="#">③</a>	High reliability, high output	Analysis, near-infrared lighting
<a href="#">L13072-0120L</a>			φ4.65	3.2					<a href="#">⑤</a>		
<a href="#">L13072-0120P</a>			φ3.0	5					<a href="#">⑪</a>	High output, narrow directivity	
<a href="#">L13072-0120G</a>			□0.31	4.4					<a href="#">⑫</a>	Surface mount type, compact	
<a href="#">L12771</a>	1300	90	φ1.15	2.8	1	15	50		<a href="#">③</a>	High reliability, high output	Analysis, near-infrared lighting
<a href="#">L12771-01</a>			φ4.65	3.1					<a href="#">⑤</a>		
<a href="#">L12771-0130G</a>			□0.31	4.4					<a href="#">⑫</a>	Surface mount type, compact	



# 1.2 to 1.55 μm

These high output near-infrared LEDs have a peak emission wavelength at 1 μm or higher. 1.2 μm, 1.3 μm, 1.45 μm, and 1.55 μm peak emission wavelength types are available. They are used for moisture measurements, analysis, near-infrared lighting, etc.

(Typ. Ta=25 °C)

Type no.	Peak emission wavelength	Spectral half width	Emitter area	Radiant flux	Forward voltage	Cutoff frequency	Measurement condition	Photo	Directivity	Features	Application examples
	(nm)	(nm)	(mm)	(mW)	(V)	(MHz)	Forward current (mA)				
<a href="#">L10660</a>	1450	120	φ1.15	2.4	1	15	50		<a href="#">③</a>	High reliability	Moisture measurement, near-infrared lighting
<a href="#">L10660-01</a>			φ4.65	2.8					<a href="#">⑤</a>		
<a href="#">L13895-0145P</a>			φ3.0	5	0.9	10			<a href="#">⑪</a>	High output	
<a href="#">L13895-0145G</a>			□0.31	4					<a href="#">⑫</a>	Surface mount type, compact	
<a href="#">L12509-0155K</a>	1550	120	φ1.15	1.9	0.8	15	50		<a href="#">③</a>	High reliability, high output	Analysis, near-infrared lighting
<a href="#">L12509-0155L</a>			φ4.65	2.7					<a href="#">⑤</a>		
<a href="#">L12509-0155P</a>			φ3.0	3.8					<a href="#">⑪</a>	High output	
<a href="#">L12509-0155G</a>			□0.31	3					<a href="#">⑫</a>	Surface mount type, compact	

# Mid-infrared LEDs

Mid-infrared LEDs with peak emission wavelengths in the mid-infrared region (3.3 μm, 3.9 μm, 4.3 μm) feature high output and are used for gas detection. They are used in combination with quantum type detectors such as InAsSb photovoltaic detectors.

(Typ. Ta=25 °C)





Type no.	Peak emission wavelength*	Spectral half width*	Emitter area	Radiant flux*	Forward voltage*	Rise time max.	Measurement condition	Photo	Directivity	Features	Application examples
	(nm)	(nm)		(mm)	(mW)	(V)	(μs)				
<a href="#">L15893-0330CA</a>	3300	400	0.67 × 0.77	1.3	2.7	1	80		<a href="#">⑮</a>	Surface mount type	Methane detection
<a href="#">L15893-0330CN</a>										Surface mount type, windowless	
<a href="#">L15893-0330MA</a>				1.5					<a href="#">⑩</a>	High output, high reliability	
<a href="#">L15893-0330ML</a>				2.6					<a href="#">⑨</a>	High output, narrow directivity	
<a href="#">L15894-0390CA</a>	3900	600	0.67 × 0.77	1.4	2.2	1	80		<a href="#">⑮</a>	Surface mount type	Reference light source for gas detection
<a href="#">L15894-0390CN</a>											
<a href="#">L15894-0390MA</a>										<a href="#">⑮</a>	
<a href="#">L15894-0390ML</a>				2.4					<a href="#">⑨</a>	High output, narrow directivity	

\* If=80 mA, QCW (quasi continuous wave) mode (pulse width=100 μs, duty ratio=50%)

# Mid-infrared LEDs

Mid-infrared LEDs with peak emission wavelengths in the mid-infrared region (3.3 μm, 3.9 μm, 4.3 μm) feature high output and are used for gas detection. They are used in combination with quantum type detectors such as InAsSb photovoltaic detectors.

(Typ. Ta=25 °C)




Type no.	Peak emission wavelength* (nm)	Spectral half width* (nm)	Emitter area (mm)	Radiant flux* (mW)	Forward voltage* (V)	Rise time max. (μs)	Measurement condition	Photo	Directivity	Features	Application examples
							Forward current QCW mode (mA)				
<a href="#">L15895-0430CA</a>	4300	1000	0.67 × 0.77	0.75	2	1	80		<a href="#">⑮</a>	Surface mount type	CO2 detection
<a href="#">L15895-0430CN</a>										Surface mount type, windowless	
<a href="#">L15895-0430MA</a>				0.8					<a href="#">⑩</a>	High output, high reliability	
<a href="#">L15895-0430ML</a>				1.4					<a href="#">⑨</a>	High output, narrow directivity	

\* If=80 mA, QCW (quasi continuous wave) mode (pulse width=100 μs, duty ratio=50%)

# Special LEDs

## SIP type LEDs

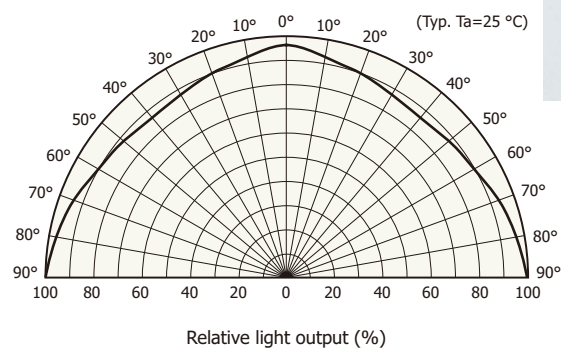
These are compact, plastic SIP (single inline package) LEDs with a lens in which the LED chip is molded in transparent resin. (Typ. Ta=25 °C)

Type no.	Peak emission wavelength (nm)	Spectral half width (nm)	Radiant flux (mW)	Forward voltage (V)	Measurement condition	Application examples	Directivity	Photo
					Forward current (mA)			
<a href="#">L10881</a>	650	25 max.	-4.5 dBm*1	1.9	20	High output for 156 Mbps optical link	<a href="#">⑮</a>	
<a href="#">L5276</a>	880	50	2.2	1.3	20	For optical switches	<a href="#">⑰</a>	
<a href="#">L6286</a>	940	45	0.8*2	1.25				
<a href="#">L6895-10</a>	940	60	1.2*2	1.25	20	For encoders	<a href="#">⑱</a>	

\*1: Fiber coupling optical output   \*2: minimum value

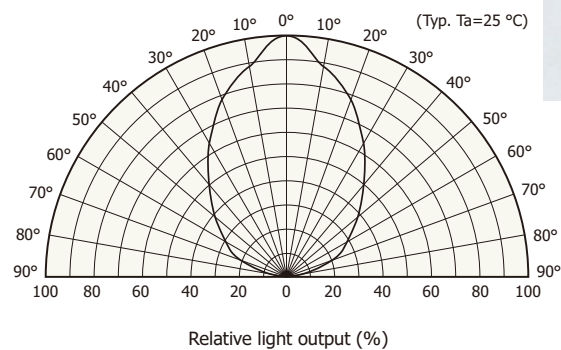
Metal package

① Resin potted type (no reflector)



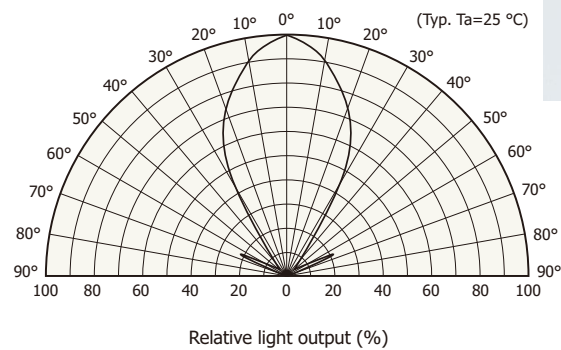
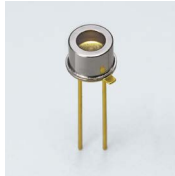
KLEDB0348EA

② Resin potted type (with reflector)



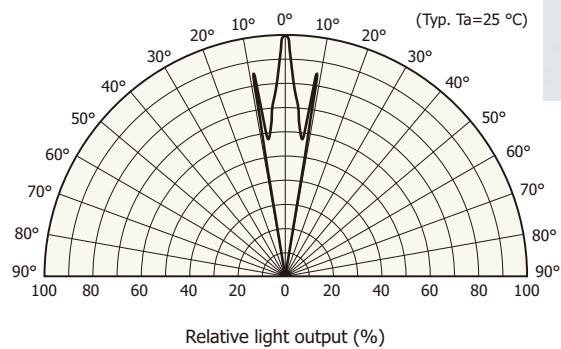
KLEDB0473EA

③ Flat cap



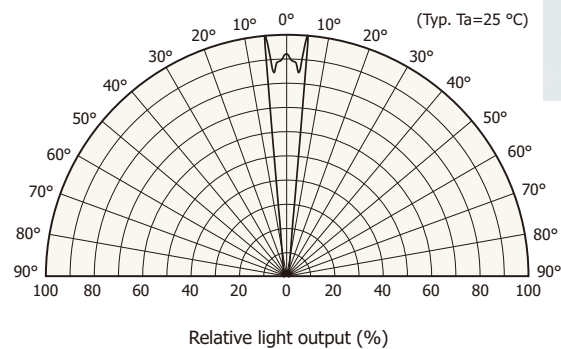
KLEDB0474EA

④ With mini lens



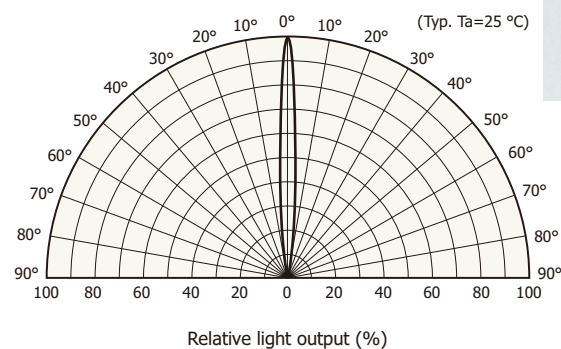
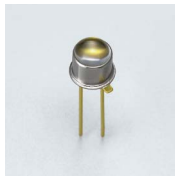
KLEDB0463EA

⑤ With lens



KLEDB0475EA

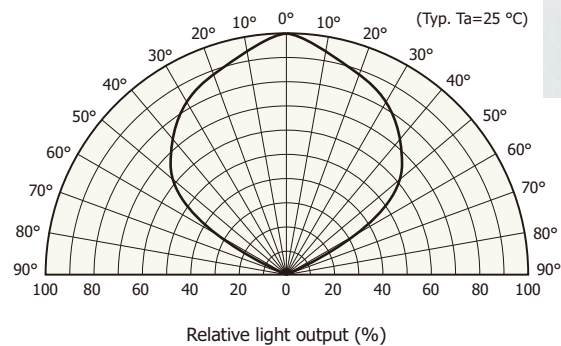
⑥ With lens (superior collimation)



KLEDB0396EA

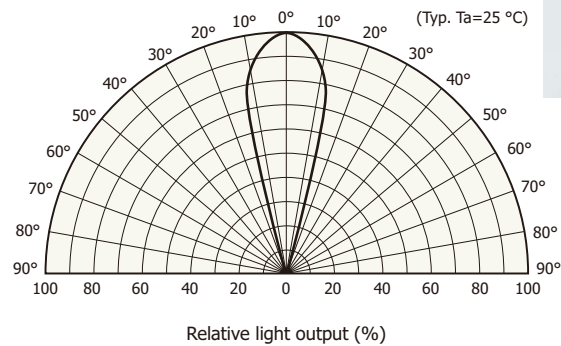
Metal package

⑦ Low-profile flat cap



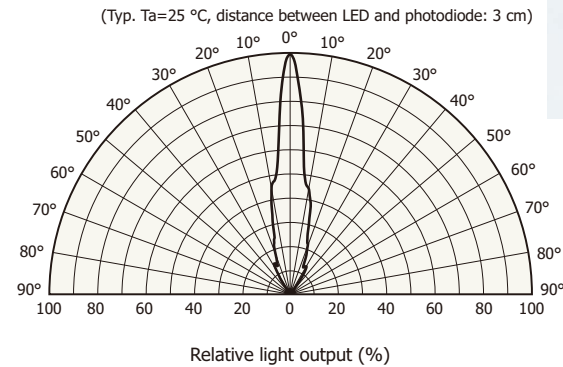
KLEDB0422EA

⑧ With ball lens



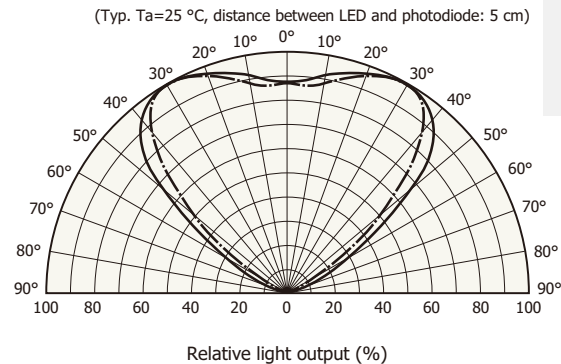
KLEDB0477EA

⑨ With reflector



KLEDB0549EA

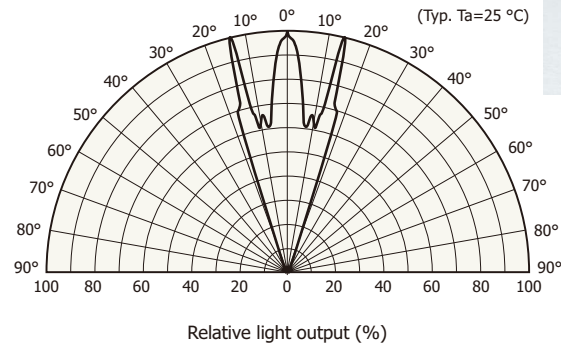
⑩ With AR coating



KLEDB0550EA

KLEDC0065EA

⑪ Bullet-shaped (φ3 mm)

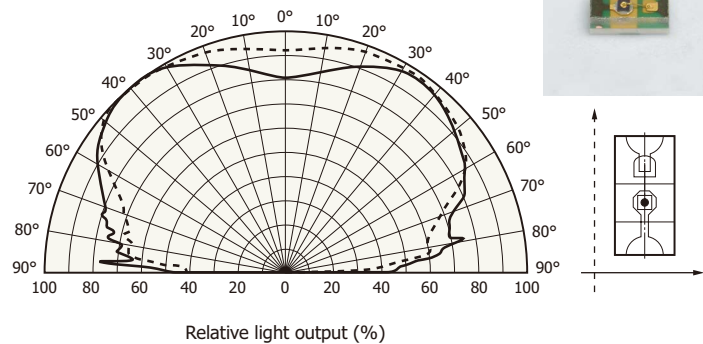


KLEDB0386EA

Plastic package

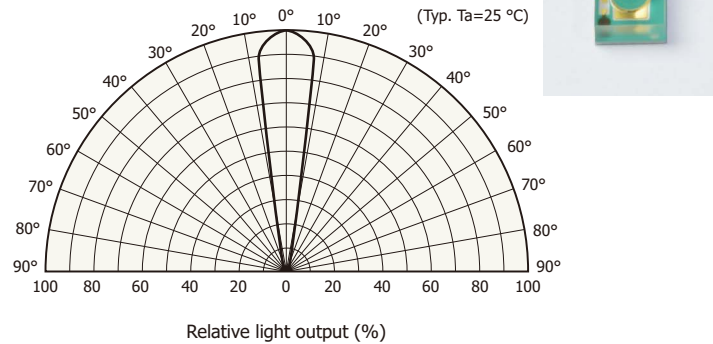
Surface mount type

⑫ COB (chip-on-board)



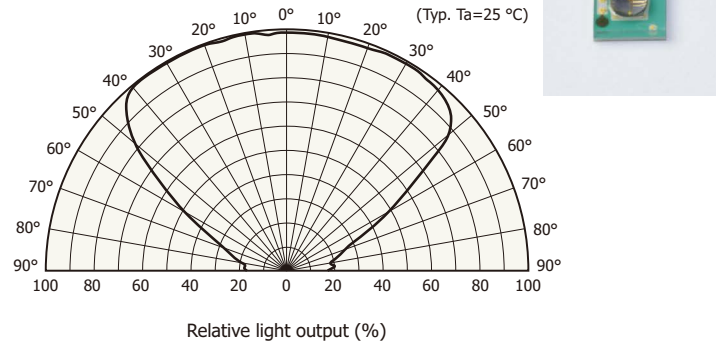
KLEDB0461EA

⑬ COB with lens (narrow directivity)



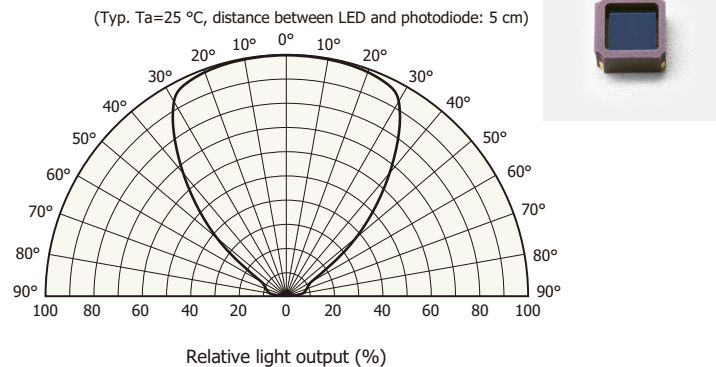
KLEDB0462EA

⑭ COB with lens (high output)



KLEDB0500EA

⑮ Ceramic type

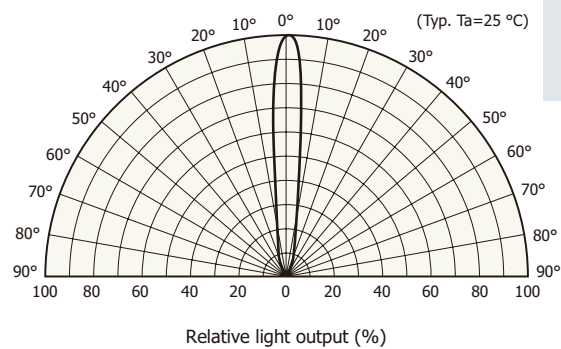


KLEDB0554EA



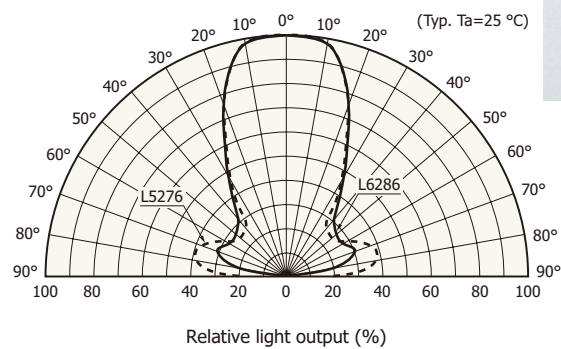
SIP type LEDs

⑩ For optical link



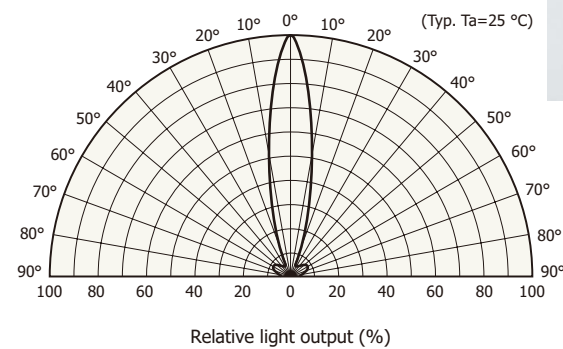
KLEDB0564EA

⑪ For optical switch



KLEDB0565EA

⑫ For encoder



KLEDB0566EA

## ● Precautions

[Disclaimer](#)

[Safety consideration / Opto-semiconductors](#)

[Precautions / Metal, ceramic, plastic package products](#)

[Precautions / Surface mount type products](#)

[Precautions / Unsealed products](#)

[Precautions / Compound opto-semiconductors \(photosensors, light emitters\)](#)

## ● [Inquiries from online](#)

**www.hamamatsu.com**

- Information described in this material is current as of July 2025.
- Product specifications are subject to change without prior notice due to improvements or other reasons. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

**HAMAMATSU PHOTONICS K.K.**

KLED0002E17 Jul. 2025 DN

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