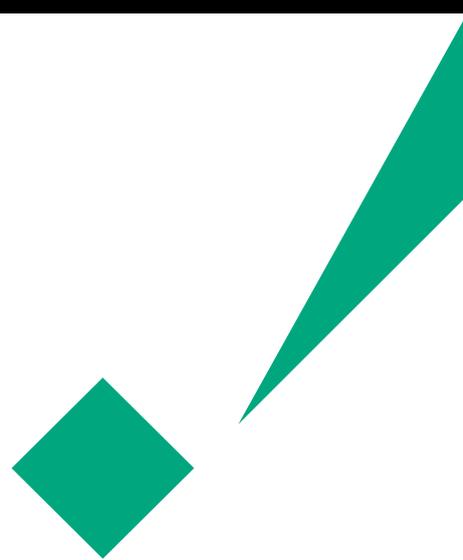




LED

Light Emitting Diodes - Solid State Lighting

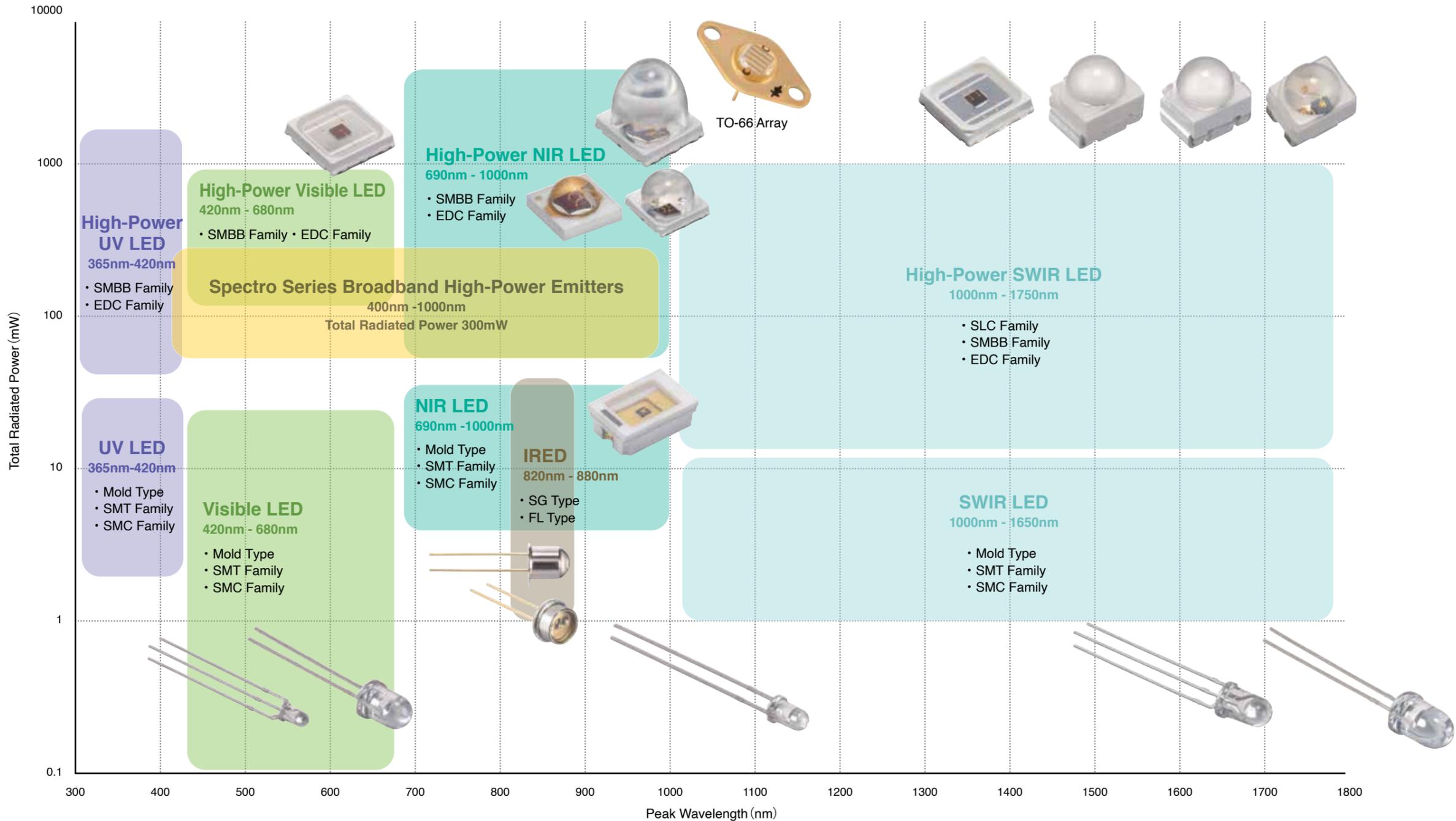


Product Map

All wavelengths between 365nm and 1,750nm can be offered.

- epitex** series
- Covering all wavelengths in the UV (ultraviolet), visible and IR (infrared) spectra, between 365 nm to 1,750 nm.
 - ◆ Various models supporting all output ranges from low-power to high-power.
 - ◆ Wide range of packages, suitable for your ideal optical design.
 - ◆ We can also propose products that combine photosensors with LEDs.

- ired** series
- High output is achieved through the use of IRED's unique domed chip formation technology, and an excellent beam shape is provided by precision lens (package) design technology. The perfect light source collection for diverse applications such as CNC machine tools, robots, ophthalmoscopes, and position detection equipment.



High-Power TOP LED SMBB Family



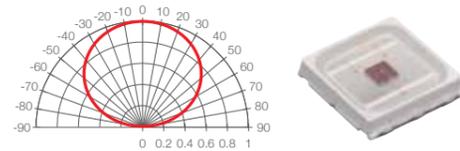
Features

- ◆ All wavelengths between 365 nm and 1,650 nm can be offered
- ◆ High-power TOP LED using 1 mm x 1 mm chip
- ◆ Package of 5 mm x 5 mm equipped with copper heat sink
- ◆ Up to three 1 mm x 1 mm chips can be mounted on an SMBB package

Specifications [e.g. SMBB760D series]

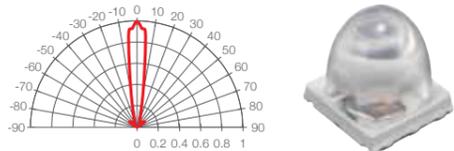
Flat Type

- ◆ Viewing Half Angle: ± 64 deg.



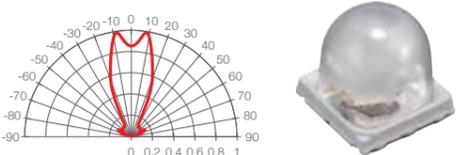
02 Lens Type

- ◆ Viewing Half Angle: ± 9 deg.



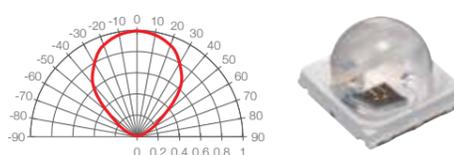
03 Lens Type

- ◆ Viewing Half Angle: ± 22 deg.

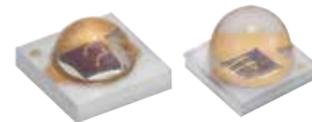


05 Lens Type

- ◆ Viewing Half Angle: ± 45 deg.



High-Power TOP LED EDC Family



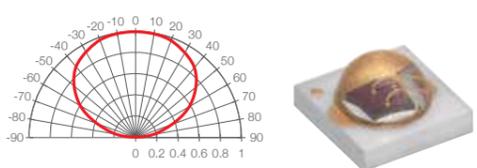
Features

- ◆ All wavelengths between 365 nm and 1,650 nm can be offered
- ◆ High-power TOP LED using 1 mm x 1 mm chip
- ◆ Ceramic Package of 3.5 mm x 3.5 mm

Specifications [e.g. EDC850DS series]

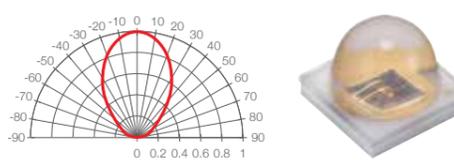
Flat Lens Type

- ◆ Viewing Half Angle: ± 66 deg.



S5 Lens Type

- ◆ Viewing Half Angle: ± 39 deg.



Surface Mount Type LED SMT Family



Features

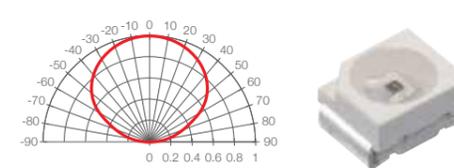
- ◆ All wavelengths between 365 nm and 1,650 nm can be offered
- ◆ Package dimension: 3.5 mm x 2.8 mm

Specifications [e.g. SMT780 series]

SMT with silicone lens

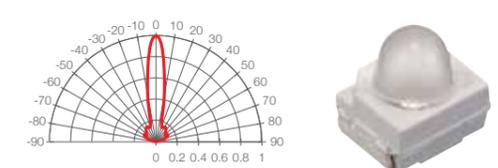
Flat Type

- ◆ Viewing Half Angle: ± 62 deg.



S1 Lens Type

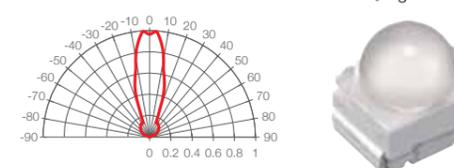
- ◆ SMT with Silicone Lens
- ◆ Viewing Half Angle: ± 10 deg.



SMT with epoxy lens (Available wavelengths: between 470 nm and 1,650 nm)

22 Lens Type

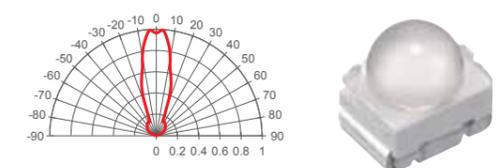
- ◆ SMT with Epoxy lens
- ◆ Viewing Half Angle: ± 15 deg.



*Applicable for specific wavelength
• SWIR Dtype
• NIR D and DS type
[e.g. SMT1550D-22]

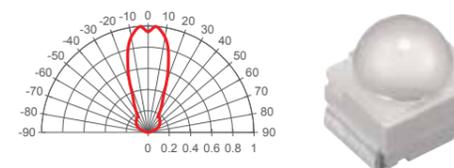
23 Lens Type

- ◆ SMT with Epoxy lens
- ◆ Viewing Half Angle: ± 16 deg.



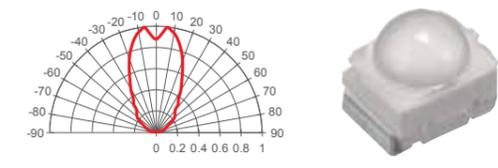
25 Lens Type

- ◆ SMT with Epoxy lens
- ◆ Viewing Half Angle: ± 20 deg.



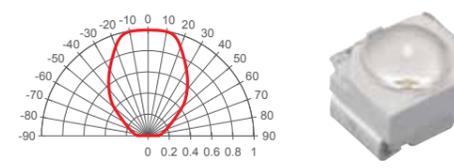
27 Lens Type

- ◆ SMT with Epoxy lens
- ◆ Viewing Half Angle: ± 39 deg.



29 Lens Type

- ◆ SMT with Epoxy lens
- ◆ Viewing Half Angle: ± 45 deg.



Molded Type

epitex series



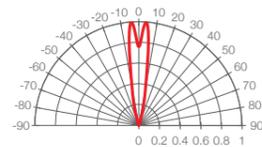
Features

- ◆ Plastic Molded Type LEDs

Specifications [e.g. L750-AU series]

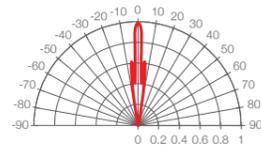
01 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±10 deg.



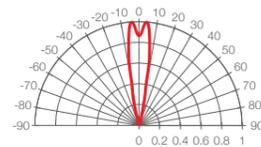
02 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±8 deg.



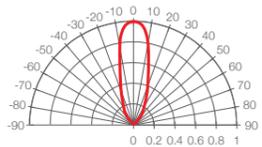
03 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±10 deg.



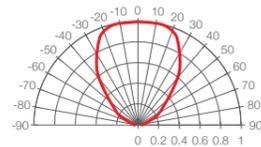
04 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±17 deg.



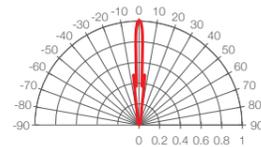
05 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±44 deg.



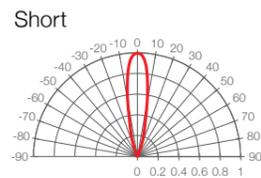
06 Lens Type

- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: ±4 deg.



09 Lens Type

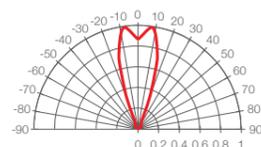
- ◆ Ø5 Plastic Molded LED
- ◆ Viewing Half Angle: Short: ±10 deg. Long: ±21 deg.



Short

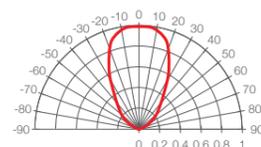
33 Lens Type

- ◆ Ø3 Plastic Molded LED
- ◆ Viewing Half Angle: ±17 deg.

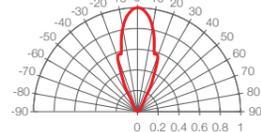


36 Lens Type

- ◆ Ø3 Plastic Molded LED
- ◆ Viewing Half Angle: ±32 deg.



Long



Infrared Light Emitting Diodes

iRED series



Features

- ◆ Achieve high optical power by unique domed-chip formation technology.
- ◆ 2 wavelength bands line up of 820 nm / 870 nm
- ◆ Set up SG-type of wide radiation beam and FL-type of collimated beam

IRED Product Lineup

	Application	Wavelength	Optical Output	Products	Package Type
iRED	General	820 nm	20 mW	HE8811	CAN type (SG)
			40 mW	HE8404SG	CAN type (SG)
	Encoder	870 nm	40 mW	HE8812SG	CAN type (SG)
			0.5 mW*	HE8807FL	CAN type (FL)
		880 nm	10 mW	HE8807SG	CAN type (SG)



SG Type

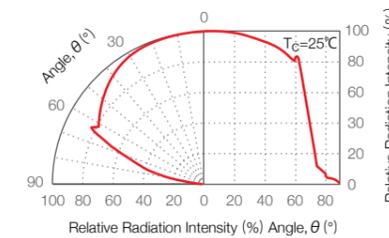


FL Type

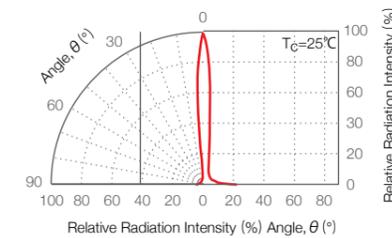
* The optical output within 9 degrees of the acceptance angle.

IRED Radiation Directional

SG Type



FL Type



IRED's Main Characteristics

Part No.	Absolute Maximum Rating		Optical and Electrical Characteristics										Test Conditions (I _F = mA)		
	Forward Current (mA)	Operating Temperature (°C)	Optical Output Power (mW)			Peak Wavelength (nm)			Spectral Width (nm)			Forward Voltage (V)			
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
HE8811	200	-20 to 60	20	30	-	780	820	900	-	50	60	-	2.0	2.5	150
HE8404SG	250	-20 to 60	40	50	-	790	820	850	-	50	60	-	1.9	2.5	200
HE8812SG	250	-20 to 60	40	50	-	840	870	900	-	50	60	-	1.8	2.5	200
HE8807SG	200	-20 to 85	10	15	-	800	880	900	-	30	60	-	1.7	2.3	150
HE8807FL	200	-20 to 85	0.5*	1.0*	-	800	880	900	-	30	60	-	1.7	2.3	150

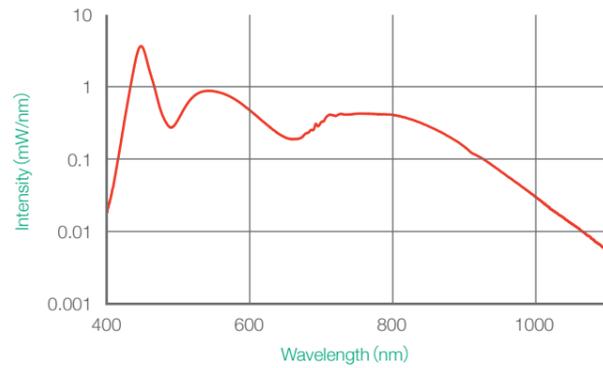
* The optical output within 9 degrees of the acceptance angle.

Spectro Series



Features

- ◆ Spectro is a series of high-output broadband LEDs which simultaneously emits visible to near infrared (NIR) wavelengths.
- ◆ Spectro can be used in machine vision and analysis applications, such as measuring the sugar or fat content of foodstuffs.



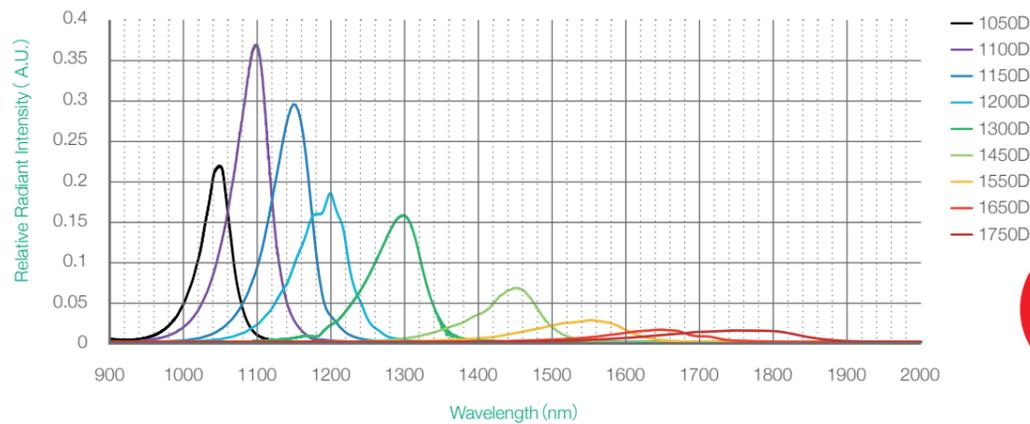
Total Radiated Power (typ) (λ = 400 - 500 nm)	140 mW (if 500 mA)
Total Radiated Power (typ) (λ = 500 - 1000 nm)	160 mW (if 500 mA)

Short Wavelength Infrared LEDs



Features

- ◆ Epitex short wavelength infrared (SWIR) LEDs offer the highest optical output power in the world.
- ◆ Standard peak wavelengths: 1,050 / 1,100 / 1,150 / 1,200 / 1,300 / 1,450 / 1,550 / 1,650 / 1,750 nm.
- ◆ Alternatively, Ushio can propose a unique wavelength selection tailored for your application.
- ◆ Visit Ushio's website, SWIR-LED.com, for in-depth analysis of SWIR LED applications and products.

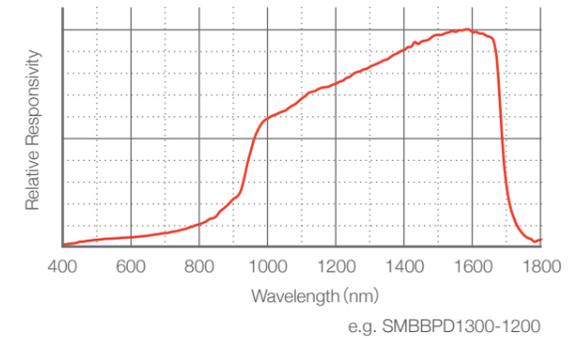


Photosensors

Features

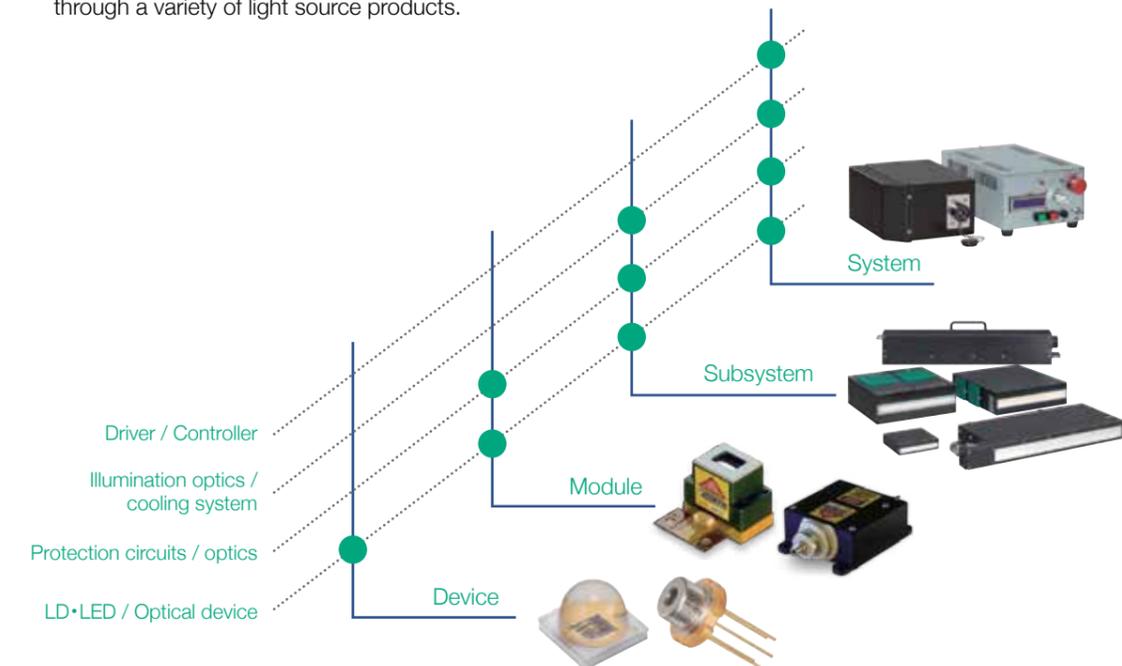
- ◆ A variety of photosensors are available to complement the 365 nm to 1,750 nm wavelength LED lineup.
- ◆ Light-emitting chips and photodiodes can be mounted together in one package.

Relative Responsivity vs. Wavelength



Ushio provides the best light source solution

- ◆ We will continue to create innovative LEDs and other products owing to contribution of Ushio's technology and experiences.
- ◆ At Ushio Inc, we can propose not only LEDs, but also optimized optical solutions for customers through a variety of light source products.



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