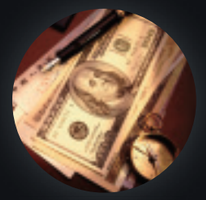
USHIO

Opto Devices
Product Information
LED



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1606S②-2000S②

USHIO's Goal

1 ONE STOP SOLUTION with USHIO's LED and LD

Optimization:
USHIO will propose the best device to your application from both LED and LD. Taking best characteristics of LED and LD into consideration.

Product Choice:
USHIO can offers to choose the best wavelength from a wider variety of products. Wavelength range from Violet, Visible, to IR for your application — ONE STOP source for your LED and LD.

Technology Advantage:
USHIO can provide the best solution for the application with "Higher irradiance, Higher efficiency, Higher reliabilities".

Option:
USHIO can propose solution to meet your needs.
1. From available packaging to best meet your needs
2. Customizing solution to match your Application.
Multi wavelength, Optical Package are some of your option.

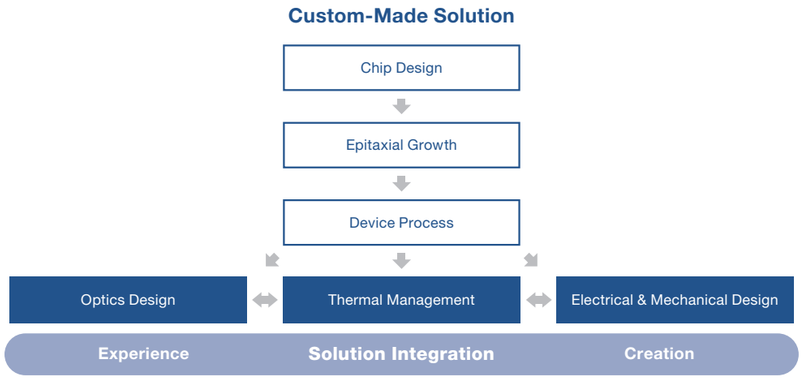
LED	**Wavelength:**	UV 365nm ~ IR 1,650nm
	Power:	High 1,400mW class ~ Low 1mW class
LD	**Wavelength:**	UV 400nm ~ IR 850nm
	Power:	High 2,000mW class ~ Low 5mW

We are preparing two brochures for "**Laser Diode**" and for "**LED**".

2 Custom-Made Solution

USHIO Advantage —— Custom-Made Experience
- **Strong "Application supports":** Collaboration with customer from start of Product Development.
- **Why Successful solution:** USHIO method — successful with more than 50-year experiences in Lighting Industries, Device and Optical technologies

USHIO Engineering —— Custom-Made Technologies
- **Chip Technologies:** ❶Design, ❷Epitaxial Growth, ❸Device Process
- **Packaging Technologies:** ❶Optics Design, ❷Thermal Management, ❸Electrical & Mechanical Design

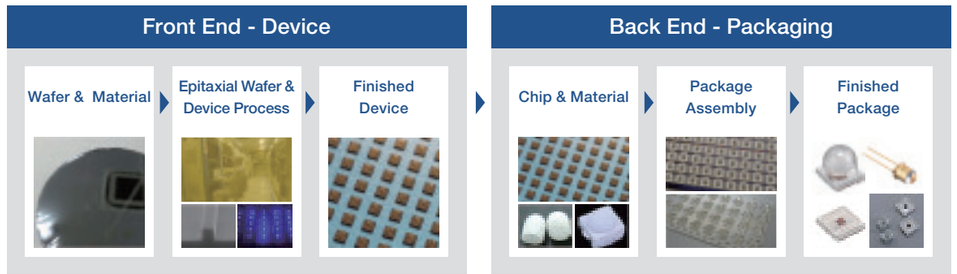


3 Application

USHIO "Lighting Know-How" will always delivery best solution(s) to customer needs. Know-How is 50 years of our knowledge in illumination, not only as light source, Light and Energy.

4 ONE STOP —— From the Beginning to the End

USHIO has Business Model using our own Technologies and Manufacturing to provide from R&D, Design, and Production (Epitaxial to Package Process).
USHIO is actively collaborating with Research Institutions and Universities to create new innovations.



5 Japanese Quality

USHIO provide "Made in Japan" products with high "Performance and Quality", that are proven by experiences and technologies for more than 50 years.

Product Map

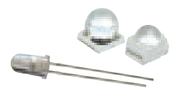
All wavelengths between 365nm and 1,650nm can be offered.

epitex Series

Covering all wavelengths in the UV (ultraviolet), visible and IR (infrared) spectra, between 365 nm to 1,650 nm.

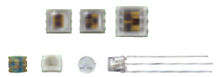
- Models supporting all output ranges from low power to high power
- Wide-ranging packages to choose from to best suit your optical design

We can also propose combination products in addition to LEDs and photo-sensors.



LEDs

Photo sensors



Multi Chips and
Multi Wavelength LEDs

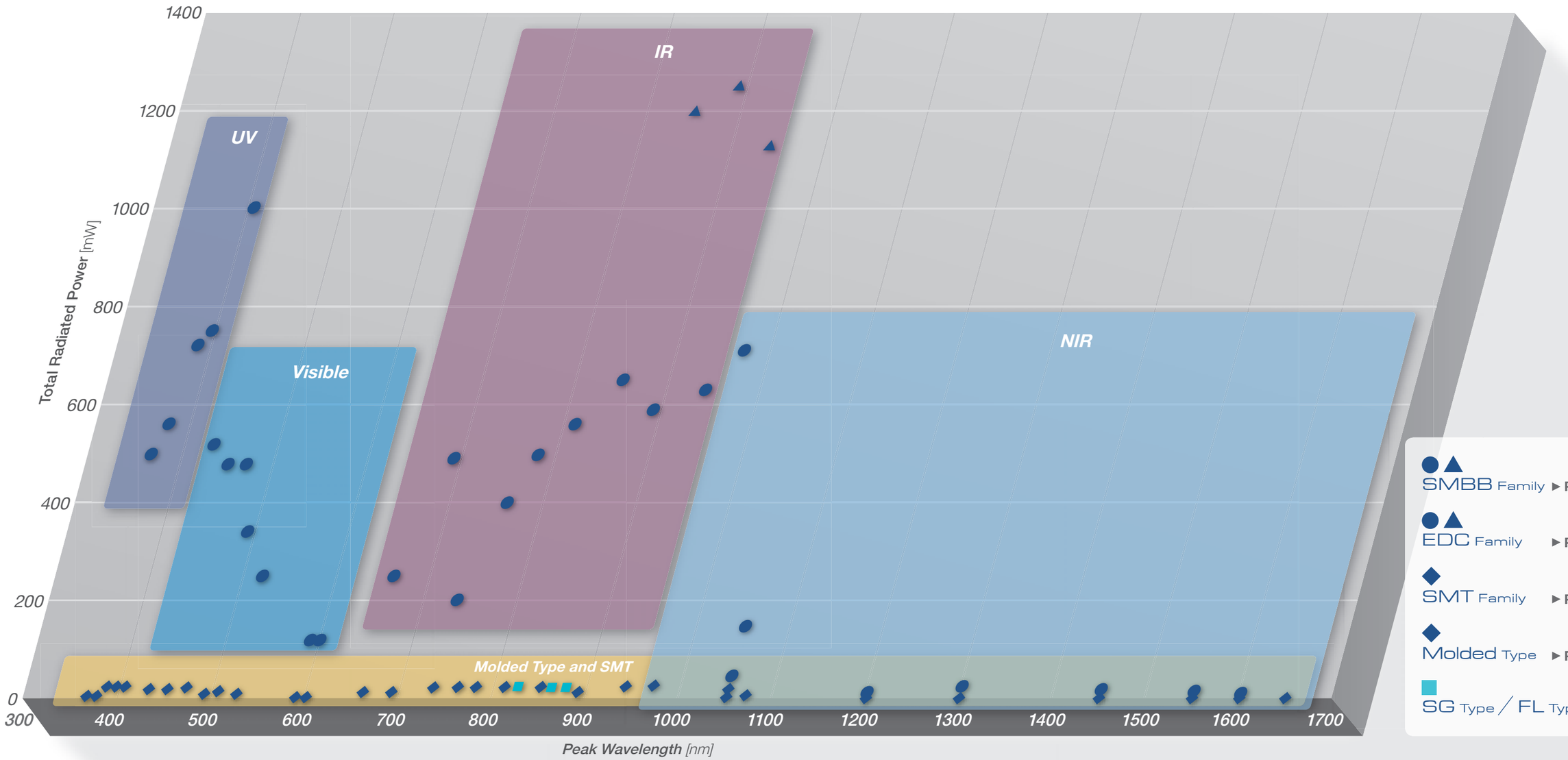
Stem Type LEDs

iRED Series

High output is achieved through the use of the unique domed-chip formation technology.
And an excellent beam shape is provided by precision lens (package) design technology.
Enable a suitable product selection as the light source for NC machine tools, robots, ophthalmoscopes and position detection equipment.

SG Type

FL Type



SMBB Family ▶ P.05

EDC Family ▶ P.05

SMT Family ▶ P.06

Molded Type ▶ P.07

SG Type / FL Type ▶ P.08

epitex Series

High Power TOP LED
SMBB Family

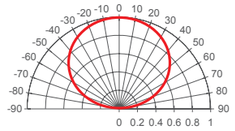
Features

- All wavelengths between 365nm and 1,650nm can be offered
- High power TOP LED using 1mm x 1mm chip
- Package of 5mm x 5mm equipped with copper heat sink
- Max. 3 pcs of 1mm x 1mm size chip can be mounted

Specifications [e.g. SMBB760D Series]

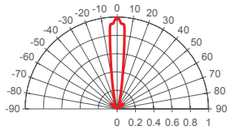
Flat Type

- Viewing Half Angle: ±64 deg.
- Total Radiated Power: 400mW
- Radiant Intensity: 130mW/sr



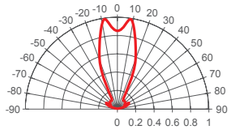
02 Lens Type

- Viewing Half Angle: ±9 deg.
- Total Radiated Power: 400mW
- Radiant Intensity: 1050mW/sr



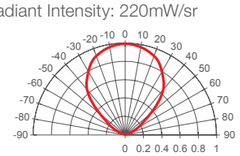
03 Lens Type

- Viewing Half Angle: ±22 deg.
- Total Radiated Power: 400mW
- Radiant Intensity: 440mW/sr



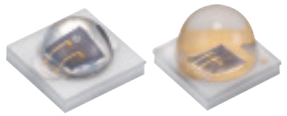
05 Lens Type

- Viewing Half Angle: ±45 deg.
- Total Radiated Power: 400mW
- Radiant Intensity: 220mW/sr



epitex Series

High Power TOP LED
EDC Family



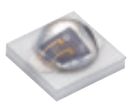
Features

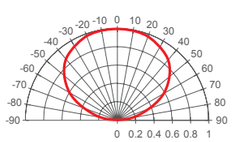
- All wavelengths between 365nm and 1,650nm can be offered
- High power TOP LED using 1mm x 1mm chip
- Ceramic Package of 3.5mm x 3.5mm

Specifications [e. g. EDC850DS Series]

Flat Type

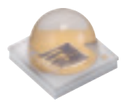
- Viewing Half Angle: ±66 deg.
- Total Radiated Power: 1200mW
- Radiant Intensity: 400mW/sr

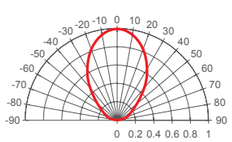




S5 Lens Type

- Viewing Half Angle: ±39 deg.
- Total Radiated Power: 1200mW
- Radiant Intensity: 1900mW/sr





epitex Series

Surface Mount Type LED
SMT Family

Features

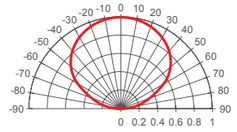
- All wavelengths between 365nm and 1,650nm can be offered
- Package dimension: 3.5mm x 2.8mm

Specifications [e.g. SMT780 Series]

SMT with Silicone Lens

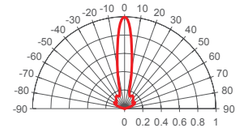
Flat Type

- Viewing Half Angle: ±62 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 10mW/sr



S1 Lens Type

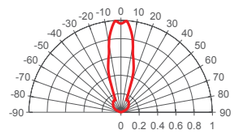
- SMT with Silicone Lens
- Viewing Half Angle: ±10 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 57mW/sr



SMT with Epoxy Lens (Allowable Wavelengths: between 470nm and 1,650nm)

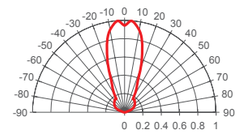
23 Lens Type

- SMT with Epoxy Lens
- Viewing Half Angle: ±16 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 40mW/sr



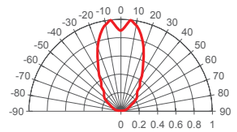
25 Lens Type

- SMT with Epoxy Lens
- Viewing Half Angle: ±20 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 26mW/sr



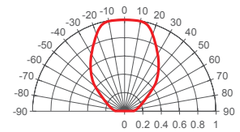
27 Lens Type

- SMT with Epoxy Lens
- Viewing Half Angle: ±39 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 19mW/sr



29 Lens Type

- Viewing Half Angle: ±45 deg.
- Total Radiated Power: 20mW
- Radiant Intensity: 13mW/sr



epitex Series

Molded Type

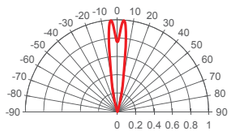
Features

- Plastic Molded Type LED

Specifications [e. g. L750-AU Series]

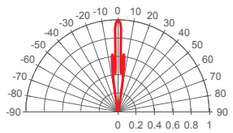
01 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle: ±10 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 90mW/sr



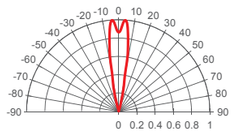
02 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle: ±8 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 120mW/sr



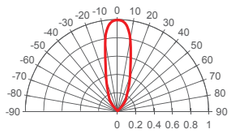
03 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle: ±10 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 90mW/sr



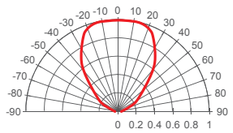
04 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle: ±17 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 46mW/sr



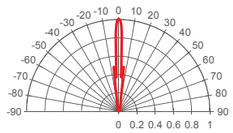
05 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle: ±44 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 12mW/sr



06 Lens Type

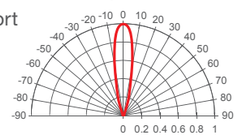
- ø5 Plastic Molded LED
- Viewing Half Angle: ±4 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 140mW/sr



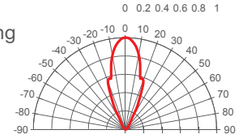
09 Lens Type

- ø5 Plastic Molded LED
- Viewing Half Angle:
  Short: ±10 deg. Long: ±21 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 75mW/sr

Short

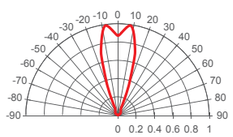


Long



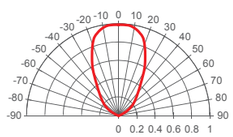
33 Lens Type

- ø3 Plastic Molded LED
- Viewing Half Angle: ±17 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 66mW/sr



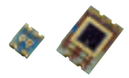
36 Lens Type

- ø3 Plastic Molded LED
- Viewing Half Angle: ±32 deg.
- Total Radiated Power: 23mW
- Radiant Intensity: 20mW/sr



epitex Series

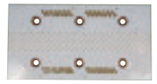
Other Products



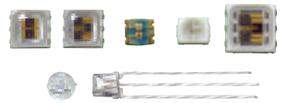
CMA Transfer Moldings

Stem Type LEDs

TO-66 LED Illuminators



Ultra High Power LED Array



Multi Chips and Multi Wavelength LEDs

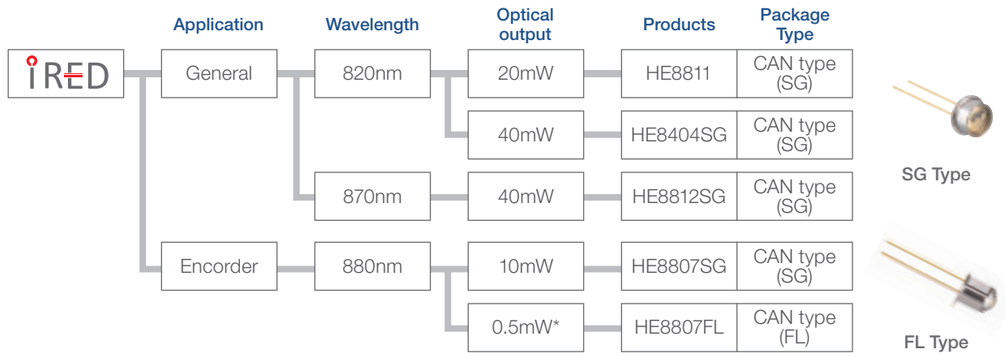
IRED Series

[Infrared Light Emitting Diodes]

Features

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

IRED's Product Lineup



★ : The optical output within 9 degrees of the acceptance angle.

IRED's Main Characteristics

Part No.	Absolute Maximum Rating		Optical and Electrical Characterristics												Test Conditions
	Forward current (mA)	Operating temperature (℃)	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	IF=150mA
HE8404SG	250	-20 to 60	40	50	-	790	820	850	-	50	60	-	1.9	2.5	IF=200mA
HE8812SG	250	-20 to 60	40	50	-	840	870	900	-	50	60	-	1.8	2.5	IF=200mA
HE8807SG	200	-20 to 85	10	15	-	800	880	900	-	30	60	-	1.7	2.3	IF=150mA
HE8807FL	200	-20 to 85	0.5*	1.0*	-	800	880	900	-	30	60	-	1.7	2.3	IF=150mA

★ : The optical output within 9 degrees of the acceptance angle.

USHIO OPTO SEMICONDUCTORS, INC.

Global Net Work

We deliver our products developed and produced
in JAPAN through Global Sales Networks.

Sales for Europe
USHIO Europe B.V.

Head office and
LD Sales for Japan
Tokyo

R&D, Production, LED Sales
Kyoto

R&D, Production
Gotemba, Shizuoka

Sales for China and Asia
USHIO Hong Kong Ltd.

Sales for North America
Necsel Intellectual
Property, Inc.

Production
Saku, Nagano