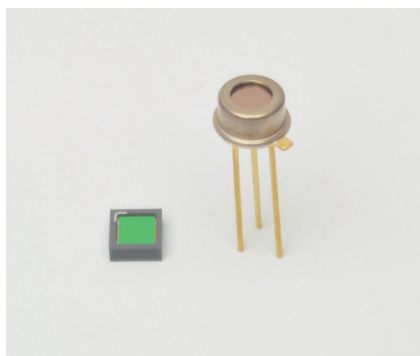


# Mid infrared LED

L15893/L15894/L15895 series



**Peak emission wavelength: 3.3 μm, 3.9 μm, 4.3 μm**

The L15893 series, L15894 series, L15895 series are mid infrared LEDs with the peak wavelength of 3.3 μm, 3.9 μm, and 4.3 μm respectively, manufactured using Hamamatsu unique crystal growth and process technologies. Output is significantly increased compared to the previous products. These are suitable as light sources mounted in gas detectors.

## Features

- High output
- High-speed response
- High reliability
- Low power consumption
- Small surface mount type ceramic package (L15893-0330C, L15894-0390C, L15895-0430C)

## Applications

- Gas detection (CH<sub>4</sub>, CO<sub>2</sub>)

## Structure

Type no.	Package	Shape	Window material
L15893-0330C	Ceramic*1	Surface mount type	Si with AR coating
L15893-0330M	Metal	TO-46	
L15894-0390C	Ceramic*1	Surface mount type	
L15894-0390M	Metal	TO-46	
L15895-0430C	Ceramic*1	Surface mount type	
L15895-0430M	Metal	TO-46	

\*1: These products are not hermetically sealed.

## Absolute maximum ratings (Ta=25 °C unless otherwise noted)

Type no.	Reverse voltage V <sub>R</sub> (V)	Forward current (QCW*2 mode) I <sub>F</sub> (mA)	Pulse forward current I <sub>FP</sub> *3 (A)	Power dissipation P (mW)	Operating temperature T <sub>opr</sub> *4 (°C)	Storage temperature T <sub>stg</sub> *4 (°C)	Soldering temperature T <sub>sol</sub> (°C)
L15893-0330C	1	100	0.5	170	-40 ~ +85	-40 ~ +100	240 (twice)*5
L15893-0330M							-
L15894-0390C				140			240 (twice)*5
L15894-0390M				-			
L15895-0430C				130			240 (twice)*5
L15895-0430M				-			

\*2: Quasi continuous wave, pulse width=100 μs, duty ratio=50%

\*3: Pulse width=10 μs, duty ratio=1%

\*4: No dew condensation. When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

\*5: Reflow soldering, JEDEC J-STD-020 MSL 3, see P.7.

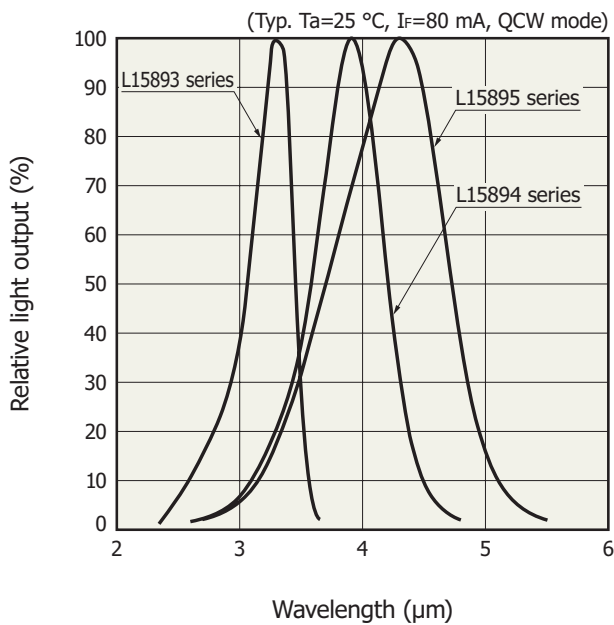
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

**Electrical and optical characteristics (Ta=25 °C)**

Type no.	Peak emission wavelength $\lambda_p^{*6}$			Spectral half width $\Delta\lambda^{*6}$		Radiant flux $\phi_c^{*6}$		Forward voltage $V_F^{*6}$		Rise time $t_r^{*6}$ 10 to 90%
	Min. ( $\mu\text{m}$ )	Typ. ( $\mu\text{m}$ )	Max. ( $\mu\text{m}$ )	Typ. ( $\mu\text{m}$ )	Max. ( $\mu\text{m}$ )	Min. (mW)	Typ. (mW)	Typ. (V)	Max. (V)	Max. ( $\mu\text{s}$ )
L15893-0330C	3.1	3.3	3.4	0.4	0.6	0.8	1.3	2.7	3.2	1
L15893-0330M						1.1	1.9			
L15894-0390C	3.8	3.9	4.1	0.6	0.9	0.8	1.4	2.2	2.7	
L15894-0390M						1.0	1.7			
L15895-0430C	4.1	4.3	4.4	1.0	1.3	0.45	0.75	2.0	2.5	
L15895-0430M						0.6	1.0			

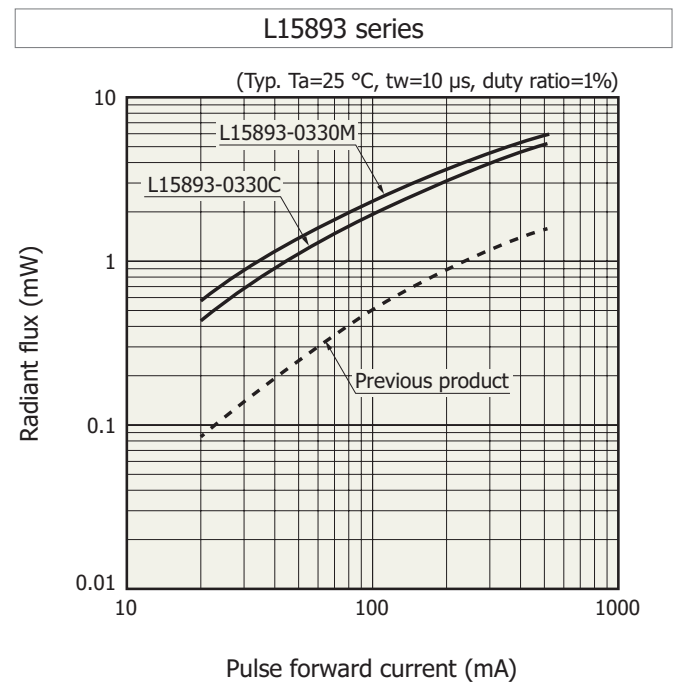
\*6: If=80 mA, QCW mode

**Emission spectrum**



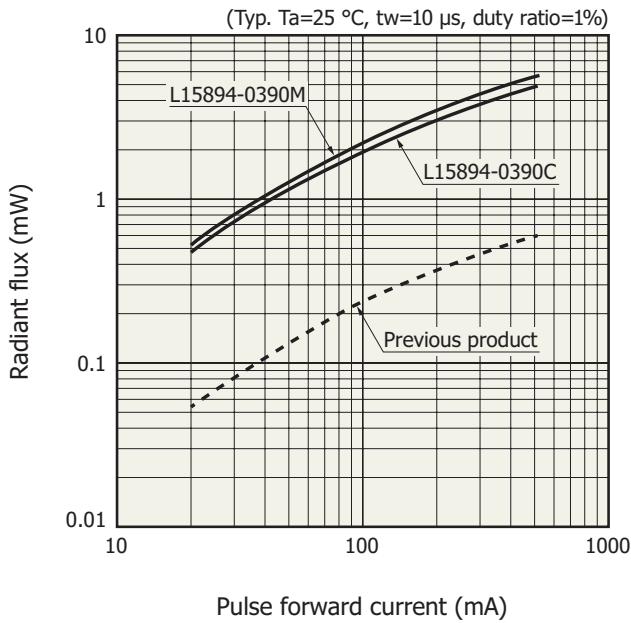
KLEDB0538EB

**Radiant flux vs. pulse forward current**

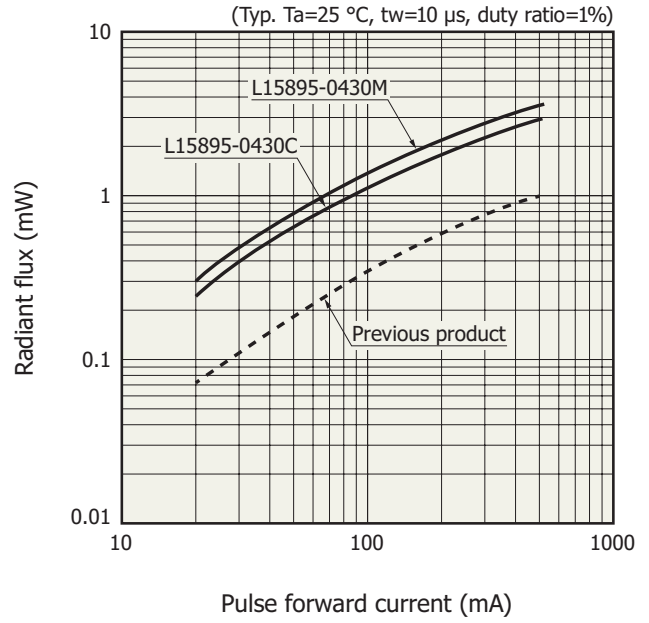


KLEDB0539EB

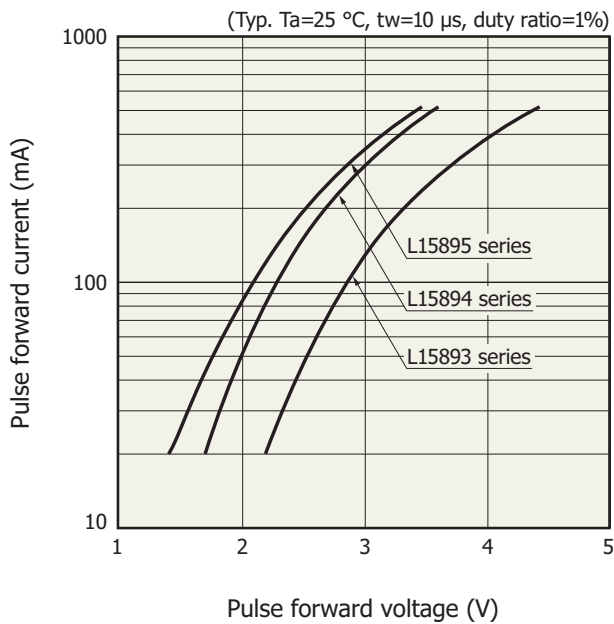
L15894 series



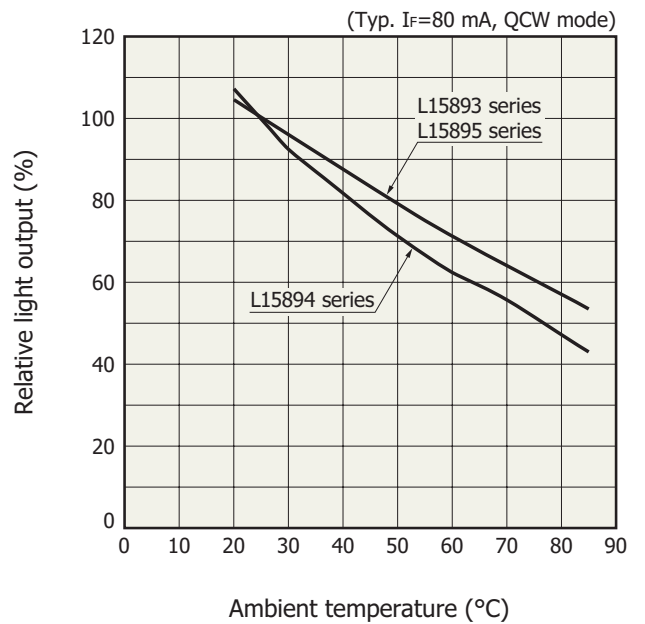
L15895 series



■ Pulse forward current vs. pulse forward voltage

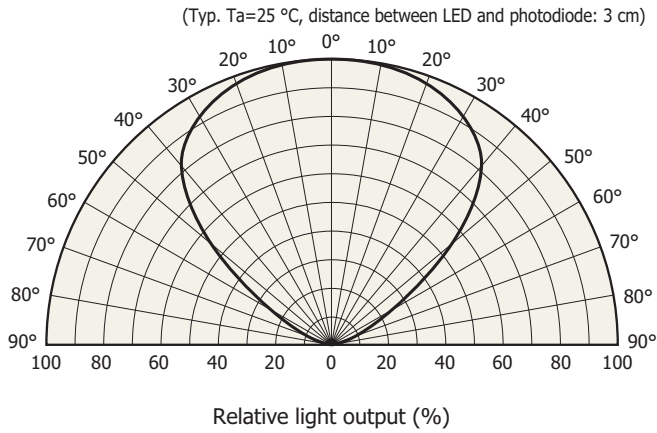


■ Light output vs. ambient temperature



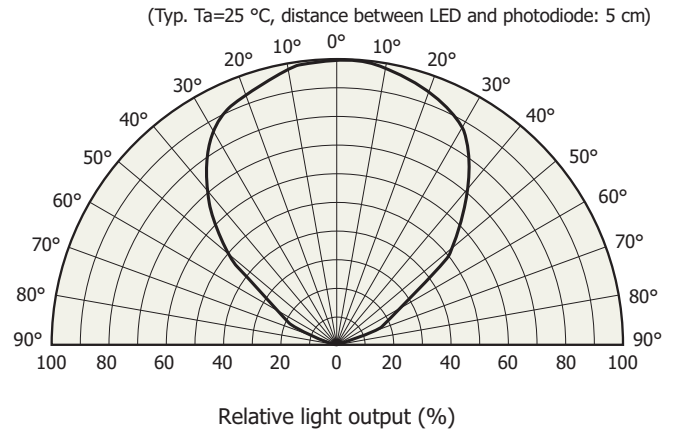
**Directivity**

L15893-0330C, L15894-0390C, L15895-0430C



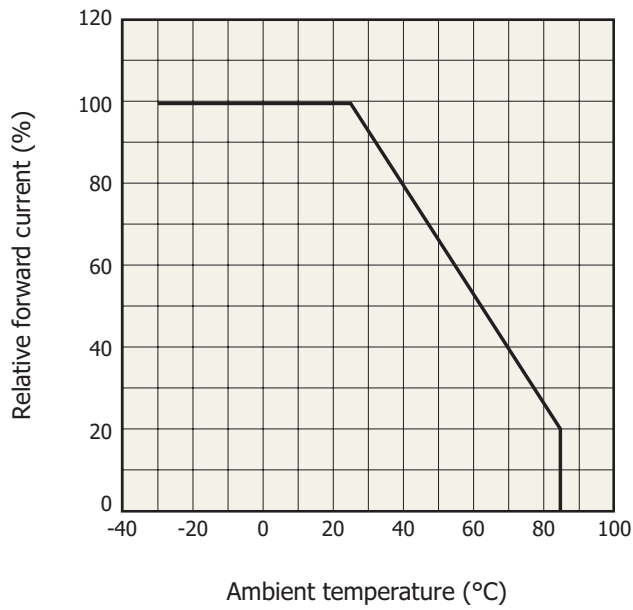
KLEDB0464EA

L15893-0330M, L15894-0390M, L15895-0430M



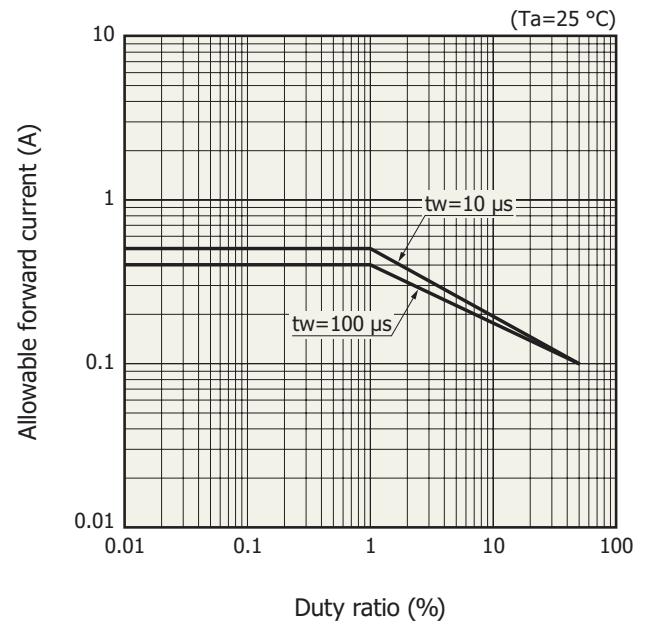
KLEDB0452EA

**Allowable forward current vs. ambient temperature**



KLEDB0417EB

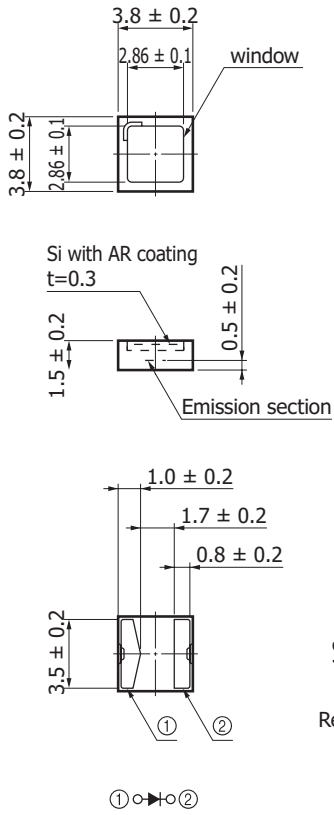
**Allowable forward current vs. duty ratio**



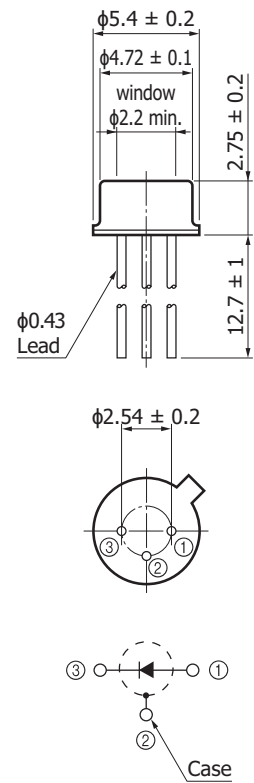
KLEDB0418EA

Dimensional outlines (unit: mm)

L15893-0330C, L15894-0390C, L15895-0430C



L15893-0330M, L15894-0390M, L15895-0430M



KLEDA0105EC

KLEDA0101ED

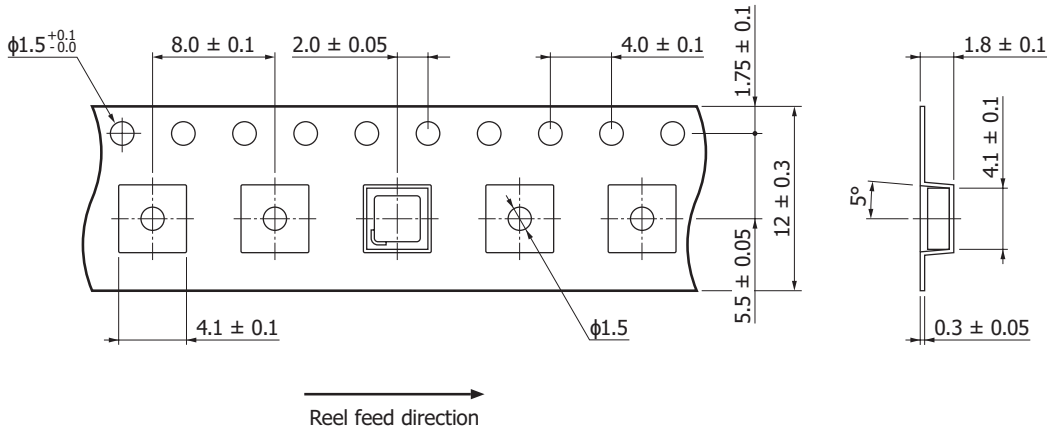
Standard packing specification

L15893-0330C, L15894-0390C, L15895-0430C

Reel (conforms to JEITA ET-7200)

Dimensions	Hub diameter	Tape width	Material	Electrostatic characteristics
180 mm	60 mm	12 mm	PS	Conductive

Embossed tape (unit: mm, material: PS, conductive)



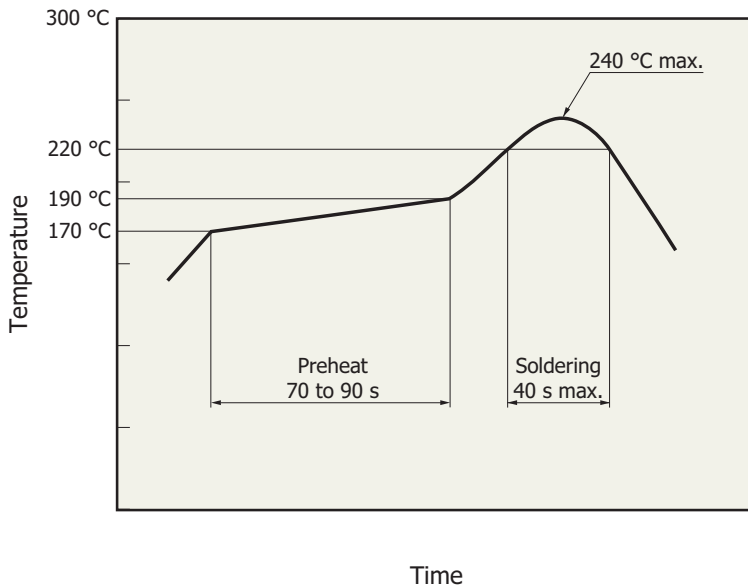
KL5DC0060EA

Packing quantity  
500 pcs/reel

Packing state  
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

## Recommended soldering conditions

L15893-0330C, L15894-0390C, L15895-0430C



- After unpacking, keep it in an environment at 5 to 30 °C and a humidity of 60% or less, and perform soldering within 168 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used.
- When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

K1RD0648EB

L15893-0330M, L15894-0390M, L15895-0430M

Solder temperature: 260 °C, 5 s or less, once

Solder the leads at a point at least 2 mm away from the package body.

Note: When you set soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

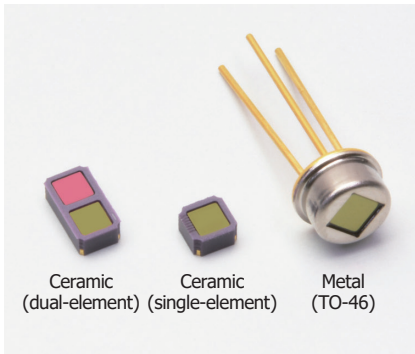
### ■ Precautions

- Disclaimer
- Safety consideration
- Metal, ceramic, plastic package products
- Compound opto-semiconductors (photosensors, light emitters)

### ■ Technical information

- LED / Technical note

## [Related products] InAsSb photovoltaic detectors with band-pass filter P13243 series



For detecting wavelengths of 3.3  $\mu\text{m}$ , 3.9  $\mu\text{m}$ , or 4.26  $\mu\text{m}$ , we also offer the P13243 series InAsSb photovoltaic detectors with band-pass filter.

Type no.	Package
P13243-015CF/-016CF	Ceramic (dual-element)
P13243-033CF/-039CF/-043CF	Ceramic (single-element)
P13243-033MF/-039MF/-043MF	Metal (TO-46)

Information described in this material is current as of November 2020.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

# HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218, E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8, E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10, E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777, E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866, E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081, E-mail: info@hamamatsu.com.tw