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Infrared LED

L12509 series

Peak emission wavelength: 1.55 µm

The L12509 series is a high-power LED that emits infrared light at a peak wavelength of 1.55 µm. The LED is suitable for applications requiring use of infrared emitters with InGaAs photodiode.

Features

- **High light output**
- **High reliability**
- **Compact, surface mount type package (1.6 × 0.8 × 0.7^{t} mm): L12509-0155G**
- **Compatible with lead-free reflow: L12509-0155G**

Applications

- **Gas detection**
- **Analytical instruments**
- **Near infrared lighting**

Structure

Type no.	Package	Window material
L12509-0155G	Surface mount type glass epoxy	Silicone resin
L12509-0155K	TO-46	Borosilicate glass
L12509-0155L	TO-46	Lens type borosilicate glass
L12509-0155P	Plastic	Bullet-shaped epoxy resin

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

Type no.	Reverse voltage V_R (V)	Forward current I_F (mA)	Forward current decrease rate Ta>25°C (mA/°C)	Pulse forward current I_{FP}*1 (A)	Pulse forward current decrease rate Ta>25°C (mA/°C)	Power dissipation P (mW)	Operating temperature Topr*2 (°C)	Storage temperature Tstg*2 (°C)	Solder temperature Tsol (°C)
L12509-0155G	1.0	80	0.8	0.5	5	150	-30 to +85	-40 to +100	250 (twice)*3
L12509-0155K			1.1	1.0	13				-
L12509-0155L									
L12509-0155P		100	1.0		10			-30 to +100	

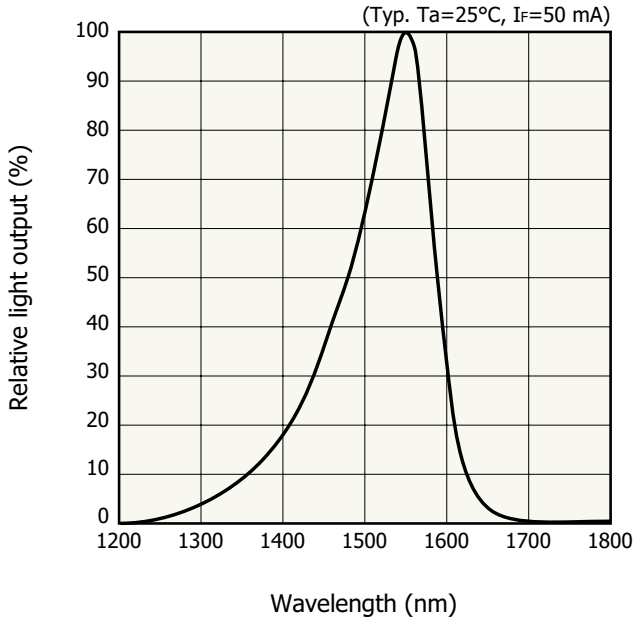
*1: Pulse width=10 µs, duty ratio=1%
*2: No dew condensation.
When there is a temperature difference between a product and the surrounding area in high humidity environments dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
*3: JEDEC J-STD-033C MSL 2a, see P.8
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)

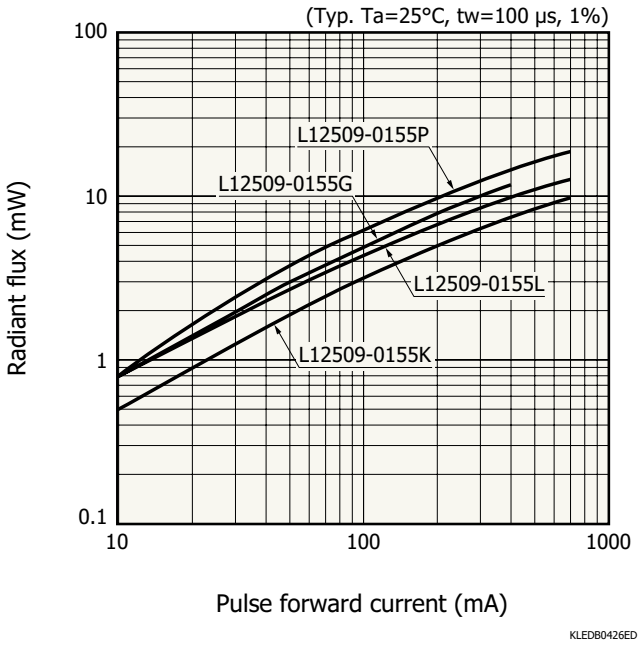
Type no.	Peak emission wavelength λp IF=50 mA			Spectral half width Δλ IF=50 mA	Radiant flux ϕe IF=50 mA		Radiant intensity Ie IF=50 mA		Forward voltage VF IF=50 mA		Reverse current IR VR=1 V	Cutoff frequency fc*4	
	Min. (nm)	Typ. (nm)	Max. (nm)	Typ. (nm)	Min. (mW)	Typ. (mW)	Min. (mW/str)	Typ. (mW/str)	Typ. (V)	Max. (V)	Max. (μA)	Min. (MHz)	Typ. (MHz)
L12509-0155G	1500	1550	1600	120	2.2	3.0	-	-	0.8	1.2	10	10	15
L12509-0155K					1.3	1.9	-	-		1.3			
L12509-0155L					1.8	2.7	-	-		1.3			
L12509-0155P					-	3.8	10	16		1.2			

*4: IF=50 mA ± 10 mAp-p. Frequency at which the light output drops by 3 dB based on light output at 100 kHz

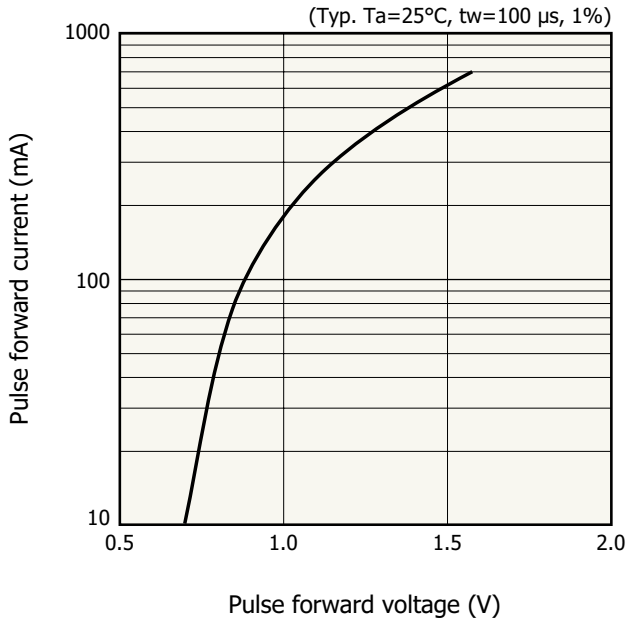
Emission spectrum



Radiant flux vs. pulse forward current

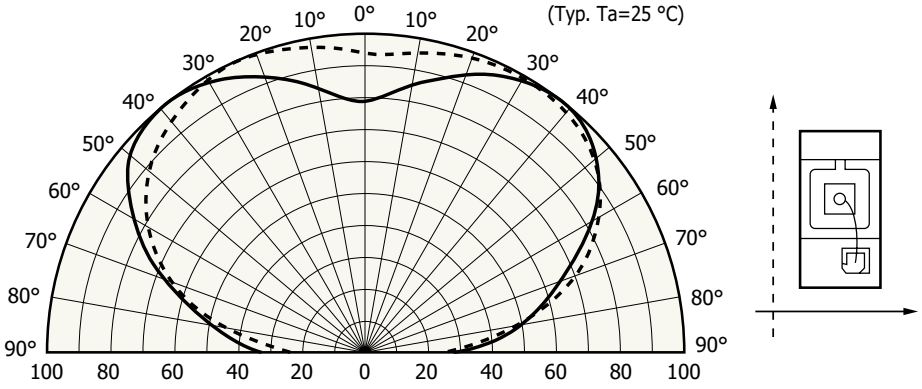


Pulse forward current vs. pulse forward voltage



Directivity

L12509-0155G



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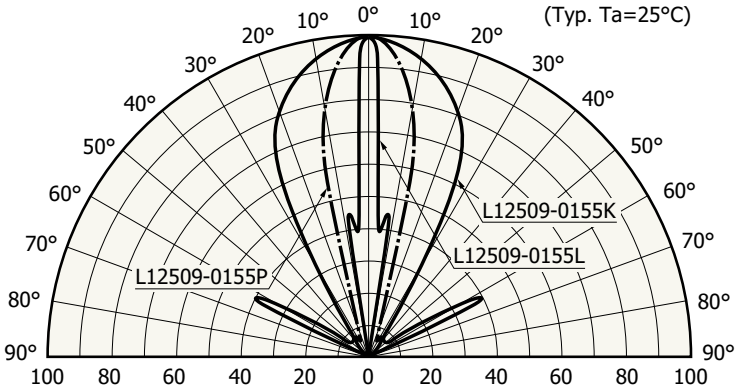
L12509-0155K/-0155L/-0155P



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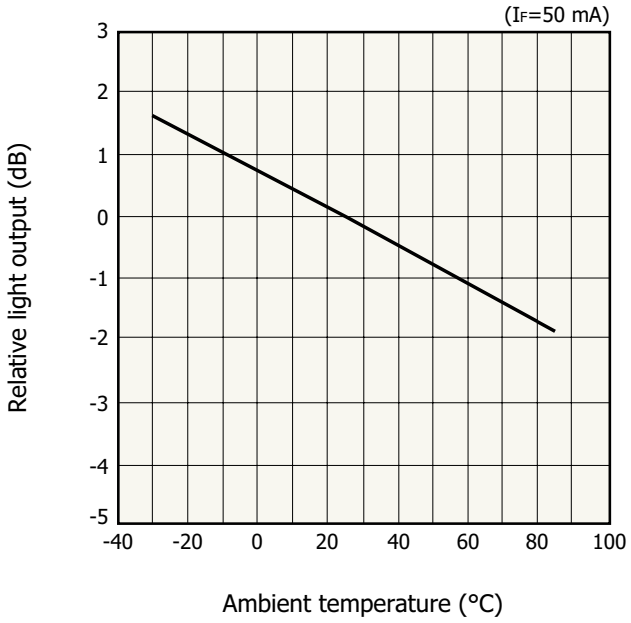
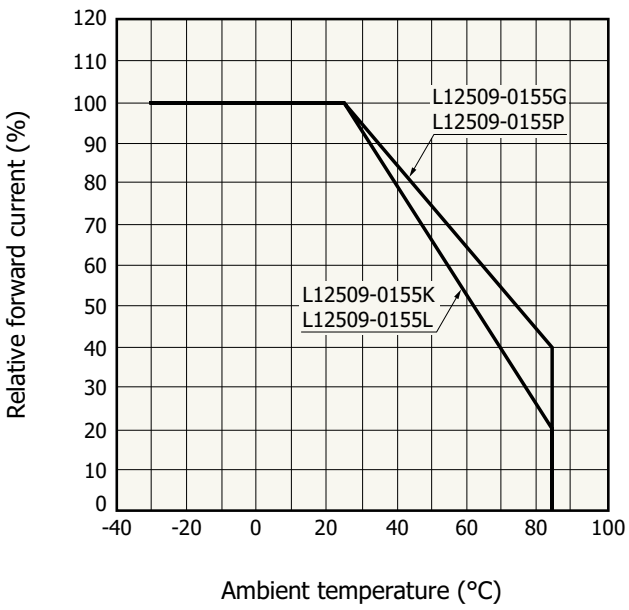
Light output vs. ambient temperature



KLEDB0429EC

Allowable forward current vs. ambient temperature



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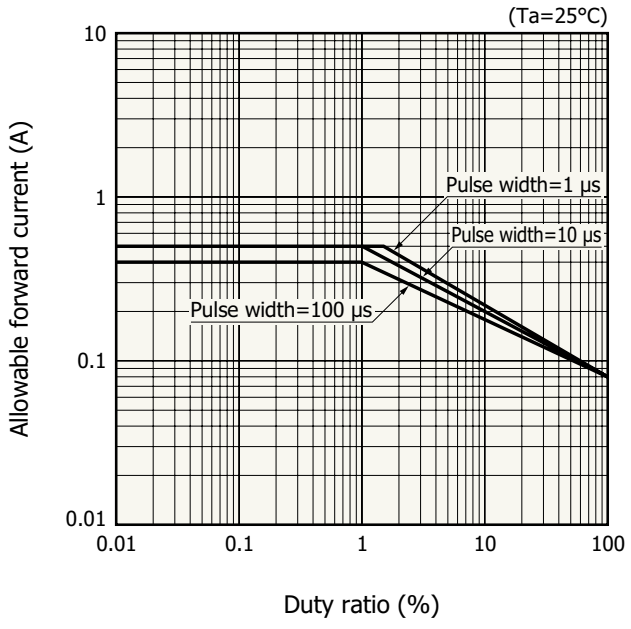
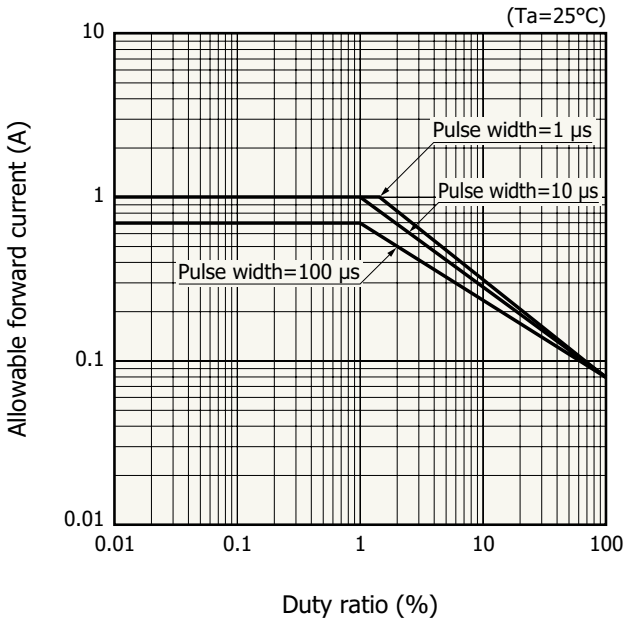
Allowable forward current vs. duty ratio

L12509-0155G



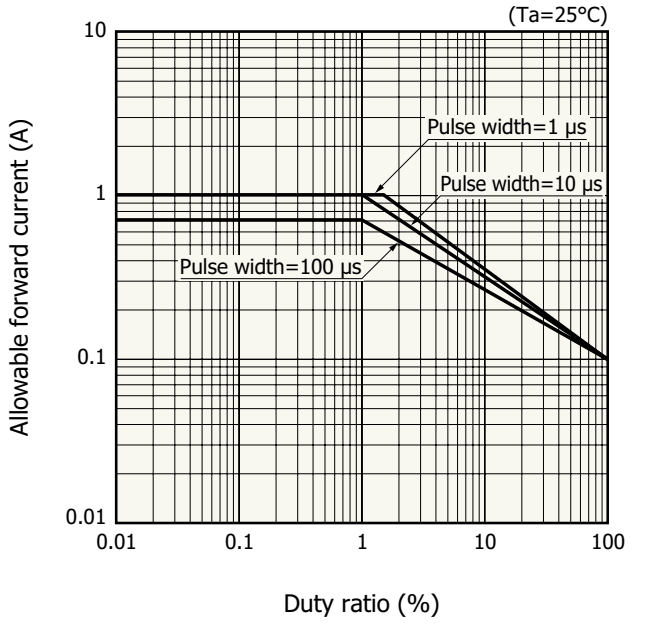
KLEDB0516EB

L12509-0155K/-0155L



KLEDB0225EC

L12509-0155P



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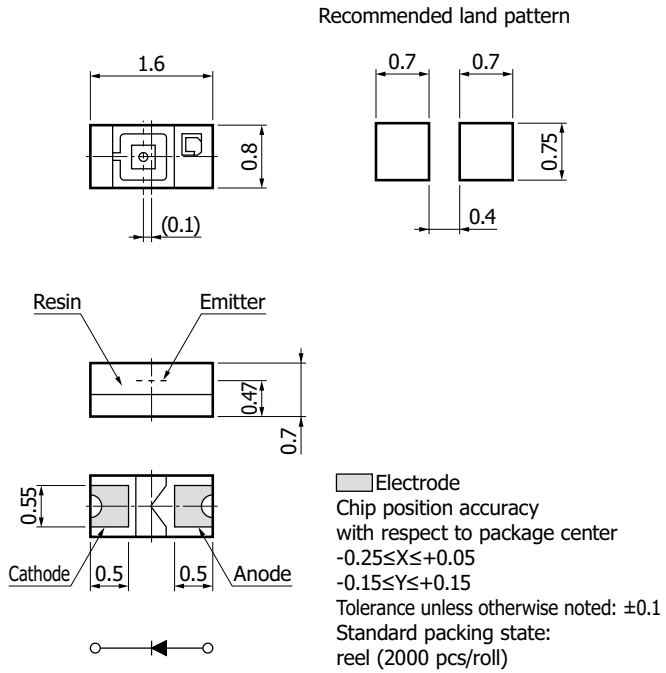
Dimensional outlines (unit: mm)

L12509-0155G



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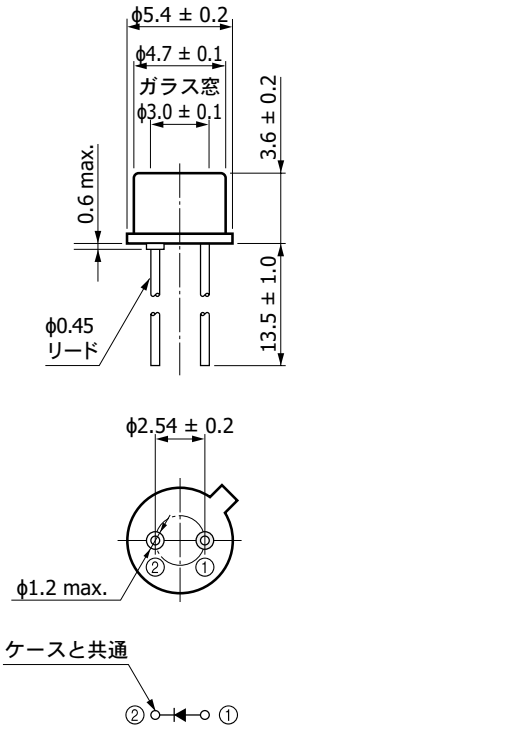
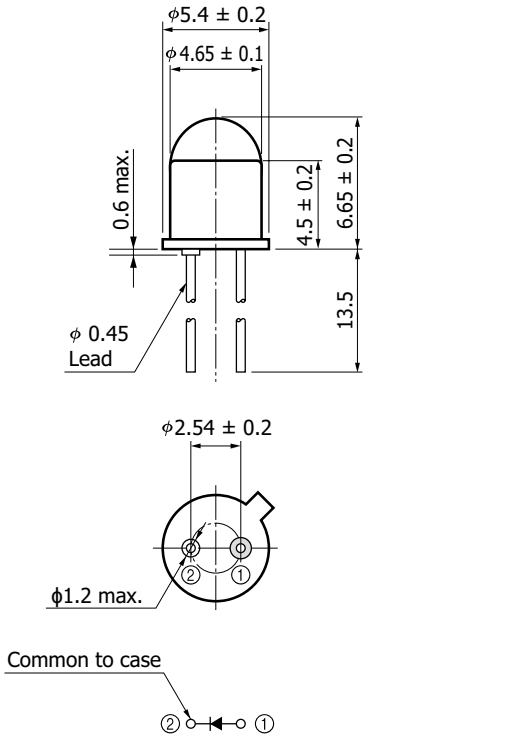
L12509-0155K



KLEDA0103EB

L12509-0155L



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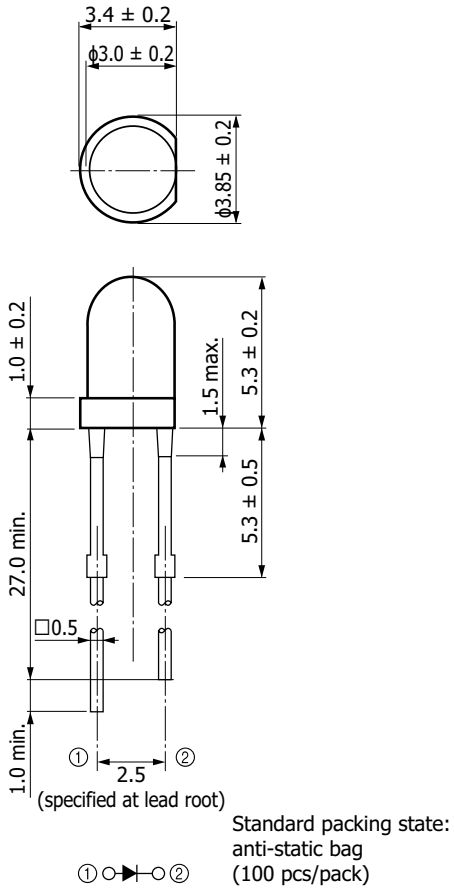
L12509-0155P



Standard packing state:
anti-static bag
(100 pcs/pack)

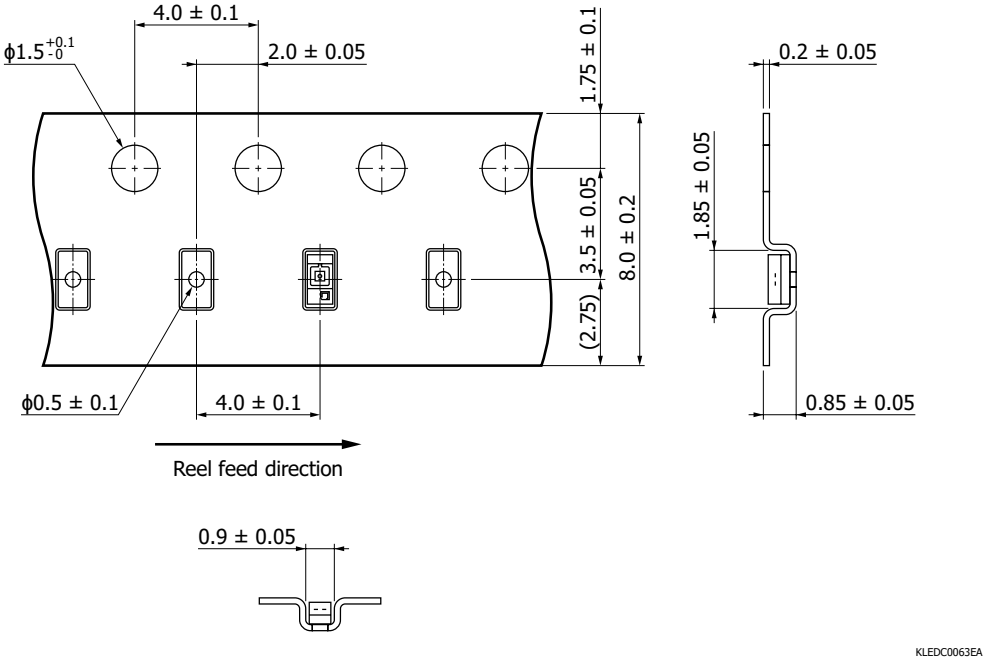
KLEDA0098EC

Standard packing specifications (L12509-0155G)

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
ϕ180 mm	ϕ60 mm	8 mm	PS	Conductive

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

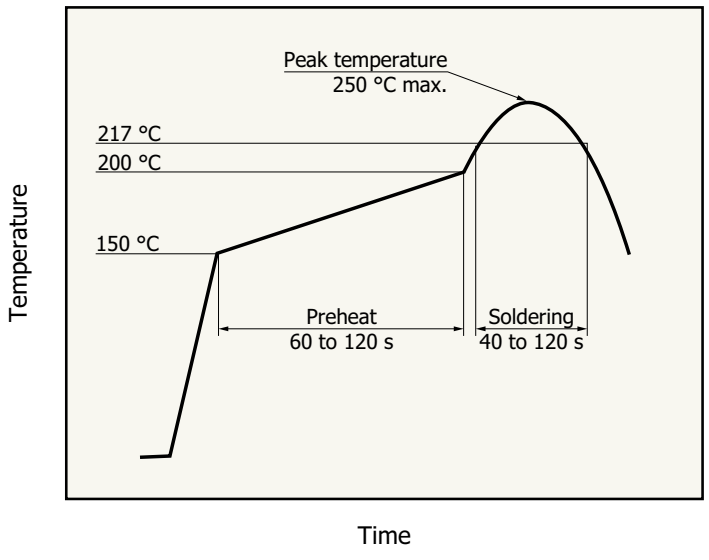


■ Packing quantity
2000 pcs/reel

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

Recommended solering conditions

L12509-0155G



· After unpacking, store the device in an environment at a temperature range of 5 to 30 °C and a humidity of 60% or less, and perform reflow soldering within 4 week.
· 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.

L12509-0155K/-0155L

· Solder temperature: 260 °C (5 s or less, once)
Solder the leads at a point at least 1 mm away from the package body.

L12509-0155P

· Solder temperature: 230 °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.

Baking (L12509-0155G)

If more than 12 months have passed in the unopend state or storage conditions are exceeded after opening the package, baking is required to remove moisture before reflow soldering. For the baking, refer to "Precautions / Surface mount type products" in the related information.

■ Recommended baking conditions

· Temperature: 150 °C (3 hours, once)

Note: Before setting the baking conditions, perform experiments to confirm that no problems occur with the product.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer
· Safety consideration / Opto-semiconductors
· Precautions / Surface mount type products
· Precautions / Compound opto-semiconductors (photosensors, light emitters)

■ Catalogs
· Selection guide / LED
· Technical note / LED

HAMAMATSU www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Chuo-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, NJ 08807, U.S.A., Telephone: (1)908 231 0960, Fax: (1)908 231 1218
Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH: Arzbergerstr. 10, 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 20044 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.: 13F 1, No.101, Section 2, Gongdao 5th Road, East Dist., Hsinchu City, 300046, Taiwan(R.O.C) Telephone: (886)3 659 0080, Fax: (886)3 659 0081 E mail: info@hamamatsu.com.tw

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