

L10596 series

Small emission spot LED using current confined chip

The L10596 is infrared LED with a microball lens cemented to the current confinement chip surface. This combination ensures narrow directivity and uniform emission. In particular, the L10596-02 uses a lens cap that delivers even narrower directivity. As a variant type not using a microball lens, the L10596-03 is also available with the LED chip potted with resin, which gives a small emission spot of $\phi 160 \mu\text{m}$. The L10569 series has a light-reflecting layer inserted between the emission section and the GaAs substrate, which increases the light output by 1.5 times (L10596-03: 1.3 times) that of conventional products.

Features

- **High radiant output power:**
L10596/-02: 3.0 mW ($I_F=50 \text{ mA typ.}$)
- **Uniform emission**
- **Small emission spot:**
L10596: $\phi 400 \mu\text{m}$
L10596-03: $\phi 160 \mu\text{m}$
- **Narrow directivity (L10596/-02)**

Applications

- **Automatic control systems**
- **Optical switches**

Absolute maximum ratings ($T_a=25 \text{ }^\circ\text{C}$)

Parameter	Symbol	Condition	Value	Unit
Forward current	I_F		80	mA
Reverse voltage	V_R		3	V
Pulse forward current	I_{FP}	Pulse width=10 μs Duty ratio=1%	0.45	A
Operating temperature	T_{op}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}	*1	-40 to +100	$^\circ\text{C}$

*1: The L10596-03 is guaranteed to resist temperature cycle test of up to 5 cycles.

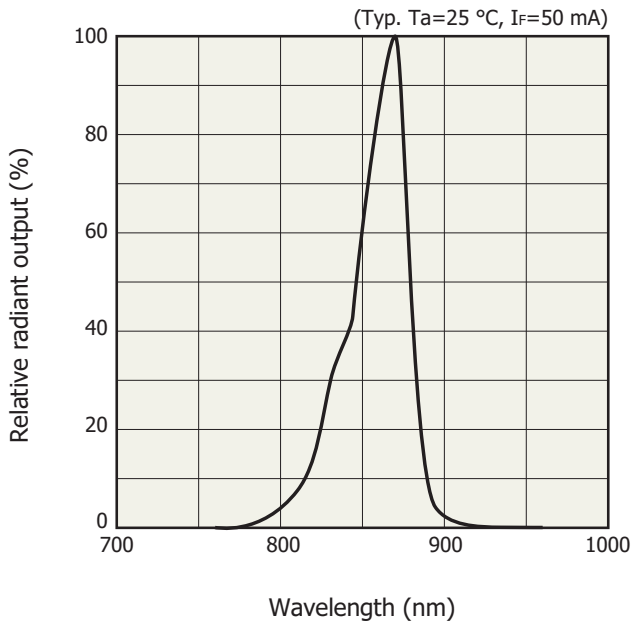
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics ($T_a=25 \text{ }^\circ\text{C}$)

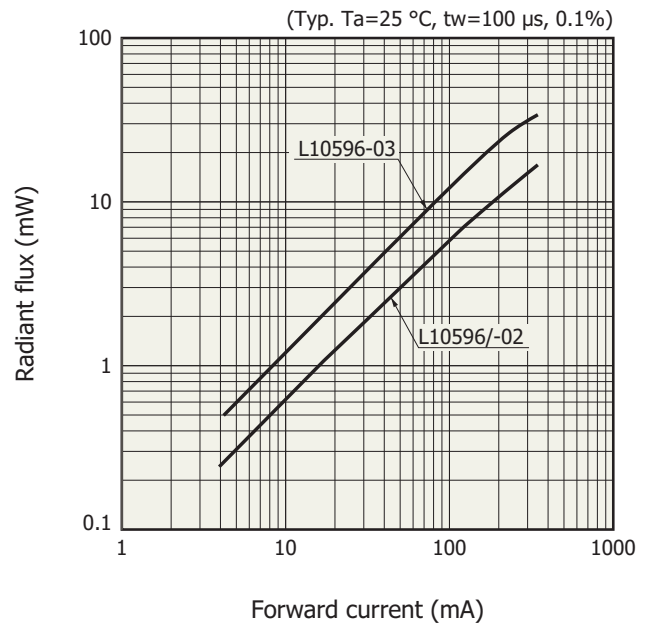
Parameter	Symbol	Condition	L10596			L10596-02			L10596-03			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Peak emission wavelength	λ_p	$I_F=50 \text{ mA}$	850	870	890	850	870	890	850	870	890	nm
Spectral half width	$\Delta\lambda$	$I_F=50 \text{ mA}$	-	35	50	-	35	50	-	35	50	nm
Forward voltage	V_F	$I_F=50 \text{ mA}$	-	1.6	1.8	-	1.6	1.8	-	1.6	1.8	V
Pulse forward voltage	V_{FP}	$I_F=0.45 \text{ A}$	-	3.3	4.1	-	3.3	4.1	-	3.3	4.1	V
Reverse current	I_R	$V_R=3 \text{ V}$	-	-	10	-	-	10	-	-	10	μA
Radiant flux	ϕ_e	$I_F=50 \text{ mA}$	2.1	3.0	-	2.1	3.0	-	5.0	6.5	-	mW
Cut-off frequency*2	f_c	$I_F=50 \text{ mA} \pm 10 \text{ mAp-p}$	10	15	-	10	15	-	10	15	-	MHz

*2: Frequency at which the radiant output drops by 3 dB relative to the output at 100 kHz

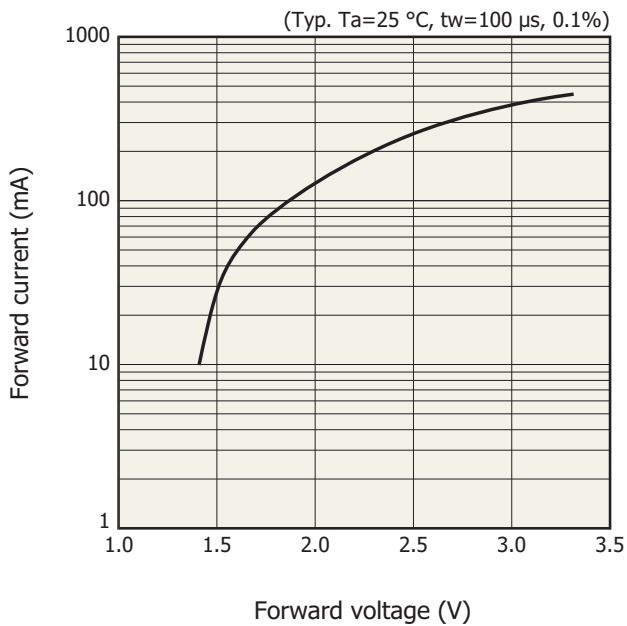
Emission spectrum



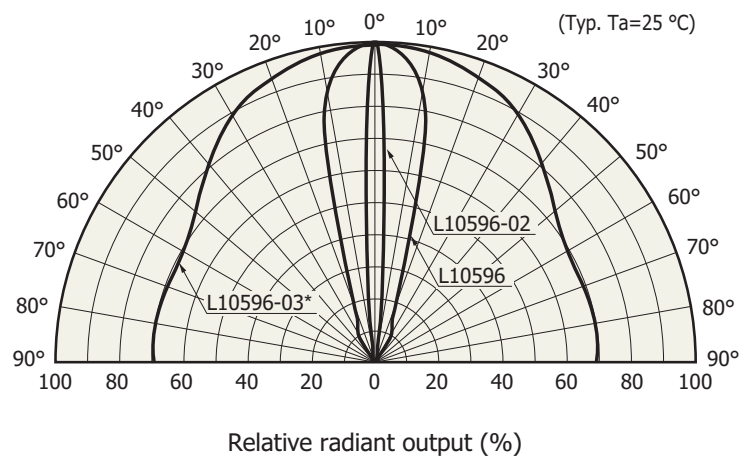
Radiant flux vs. forward current



Forward current vs. forward voltage

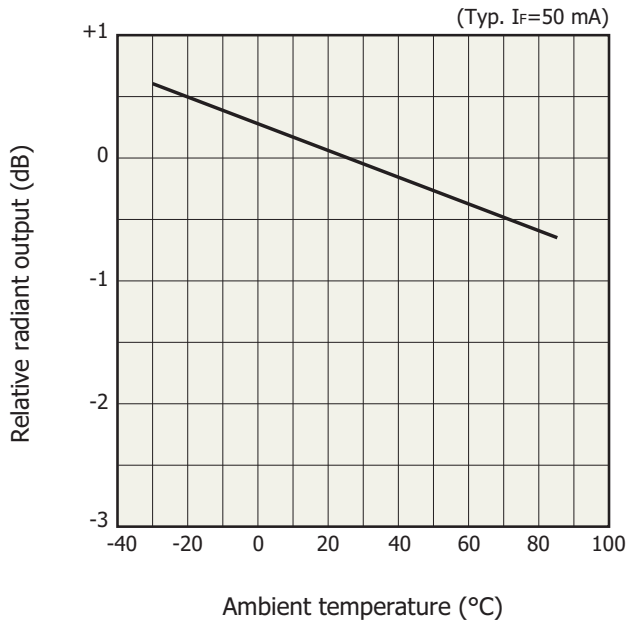


Directivity

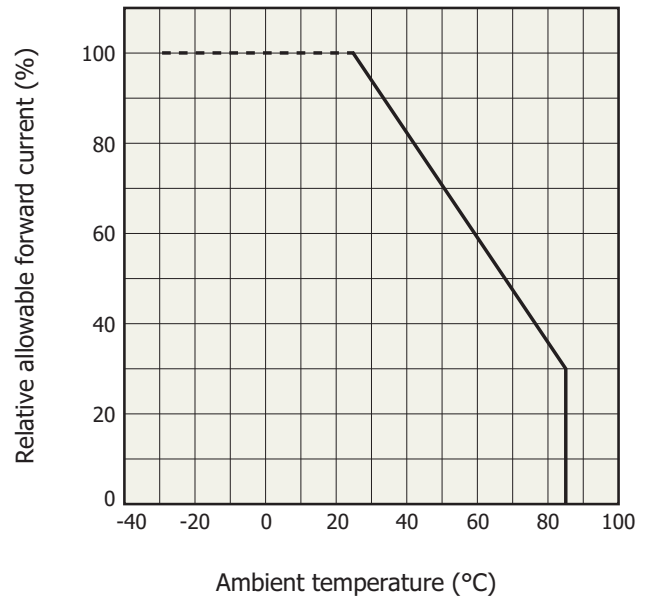


* L10596-03: Except for reflection ingredient of the base

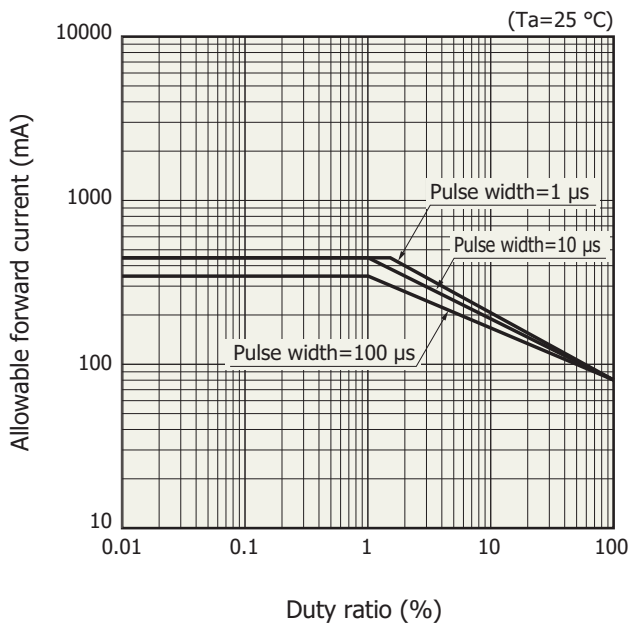
❑ Radiant output vs. ambient temperature



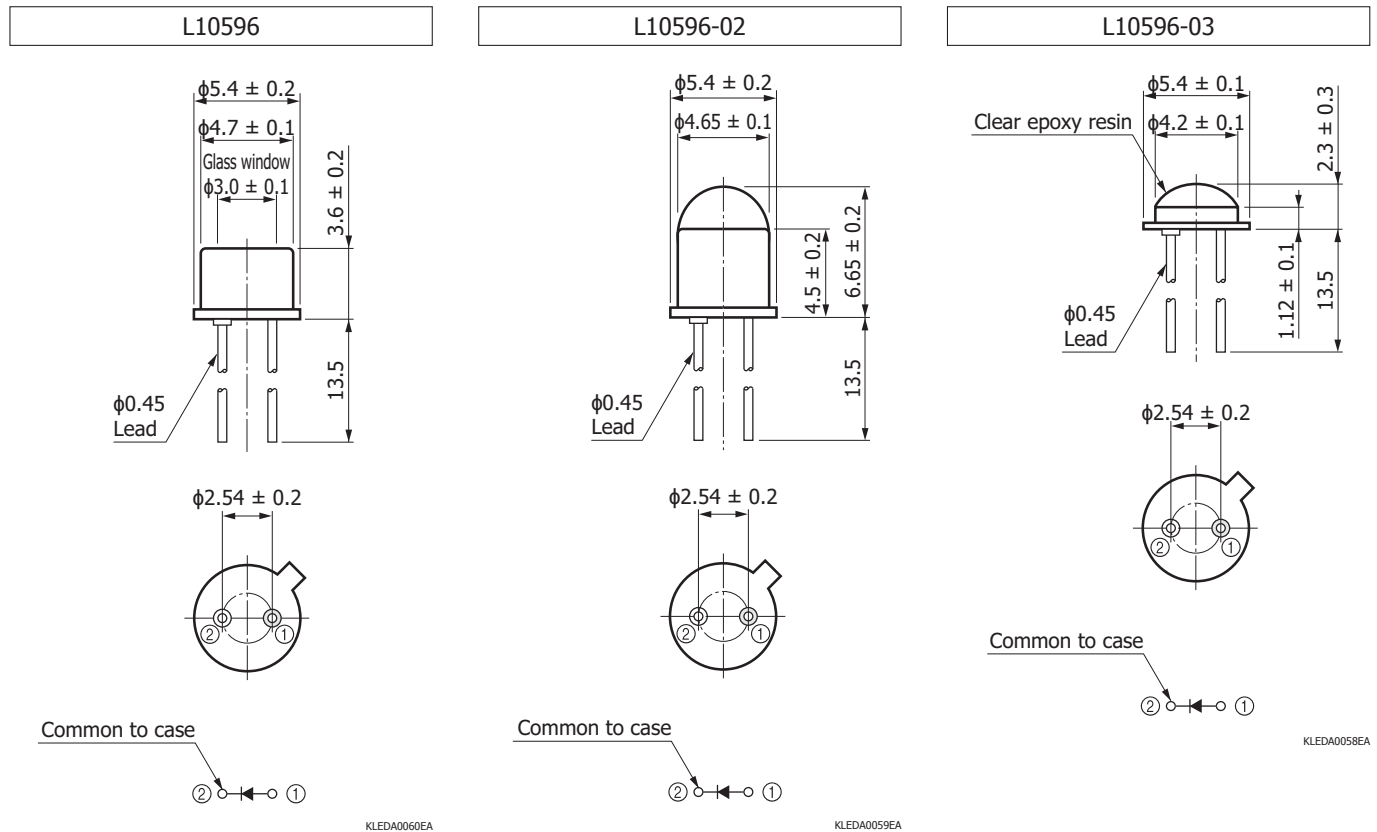
❑ Allowable forward current vs. ambient temperature



❑ Allowable forward current vs. duty ratio



Dimensional outlines (unit: mm)



Related information

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

Precautions

- Disclaimer
- Metal, ceramic, plastic products

Information described in this material is current as of November, 2015.

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.

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