



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 (IF=50 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 (Ta=25 °C)

Parameter	Symbol	Condition	Value	Unit
Forward current	IF		80	mA
Reverse voltage	VR		3	V
Pulse forward current	IFP	Pulse width=10 μs Duty ratio=1%	0.45	A
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg	*1	-40 to +100	°C

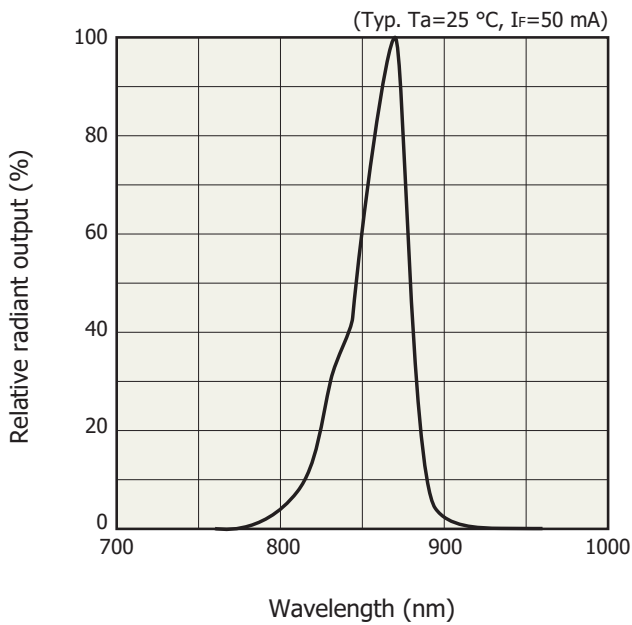
*1: The L10596-03 is guaranteed to resist temperature cycle test of up to 5 cycles.

Electrical and optical characteristics (Ta=25 °C)

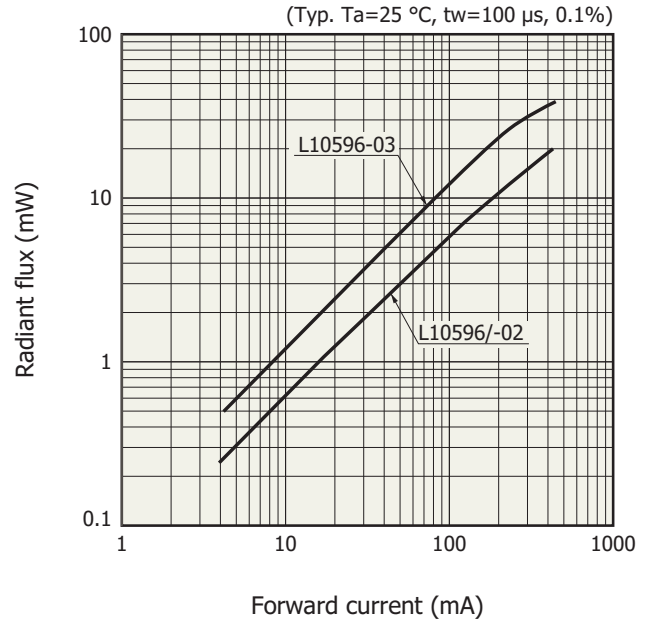
Parameter	Symbol	Condition	L10596			L10596-02			L10596-03			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Peak emission wavelength	λ_p	IF=50 mA	850	870	890	850	870	890	850	870	890	nm
Spectral half width	$\Delta\lambda$	IF=50 mA	-	35	50	-	35	50	-	35	50	nm
Forward voltage	VF	IF=50 mA	-	1.6	1.8	-	1.6	1.8	-	1.6	1.8	V
Pulse forward voltage	VFP	IF=0.45 A	-	3.3	4.1	-	3.3	4.1	-	3.3	4.1	V
Reverse current	IR	VR=3 V	-	-	10	-	-	10	-	-	10	μA
Radiant flux	ϕ_e	IF=50 mA	2.1	3.0	-	2.1	3.0	-	5.0	6.5	-	mW
Cut-off frequency*2	fc	IF=50 mA \pm 10 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

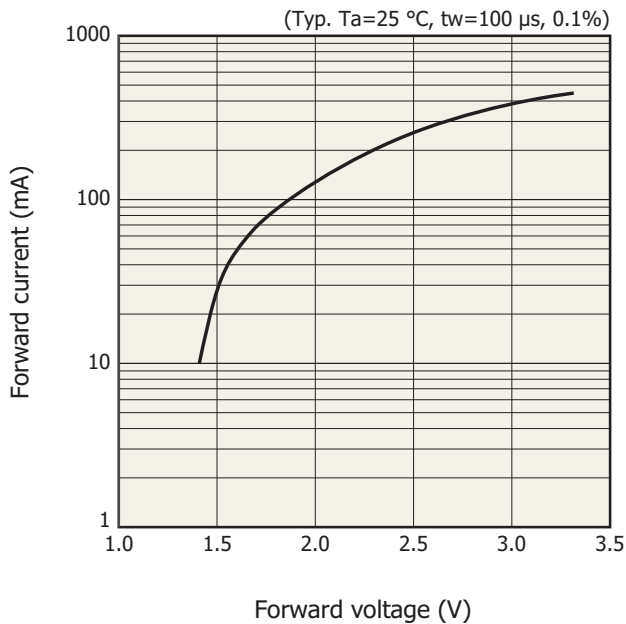
Emission spectrum



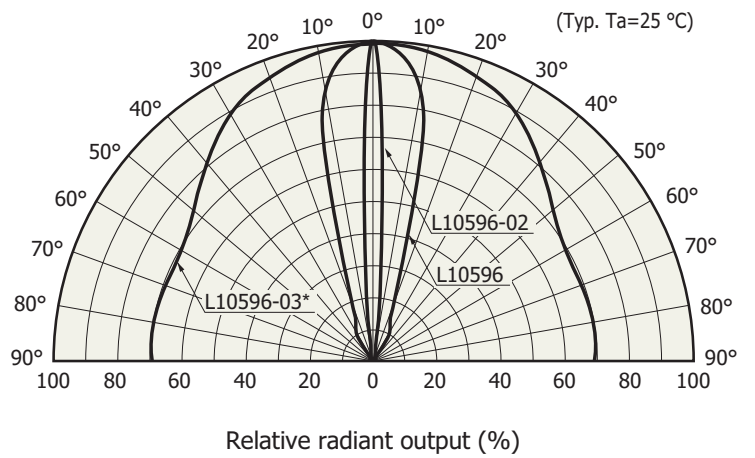
Radiant flux vs. forward current



Forward current vs. forward voltage

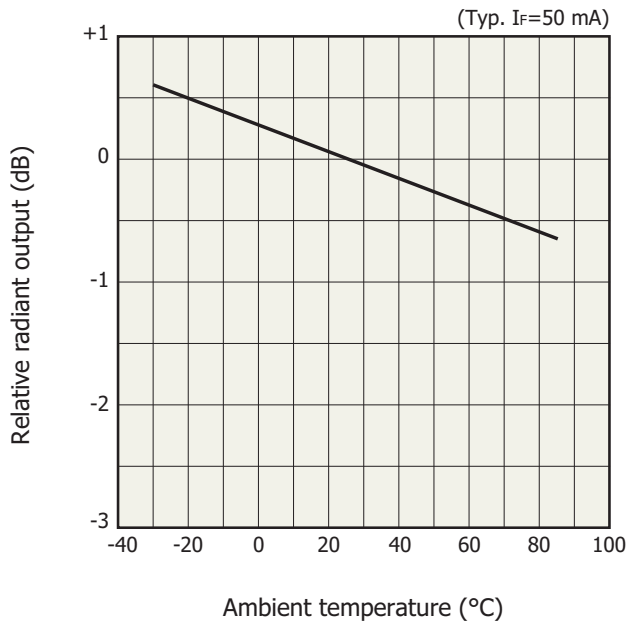


Directivity

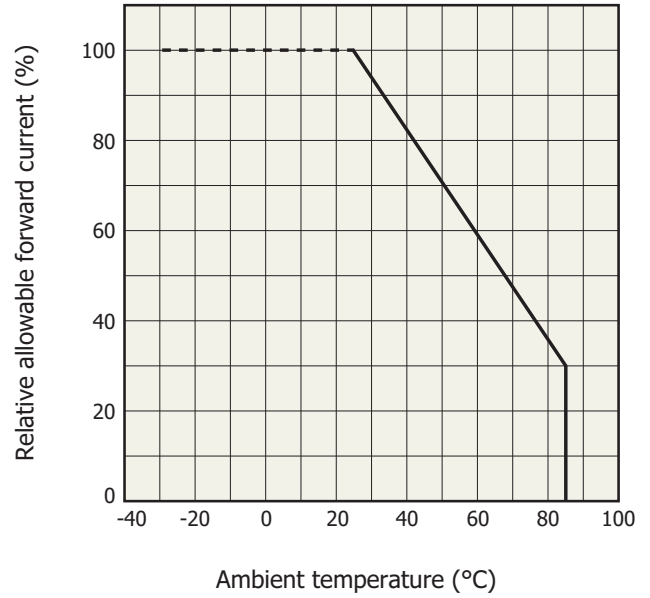


* L10596-03: Except for reflection ingredient of the base

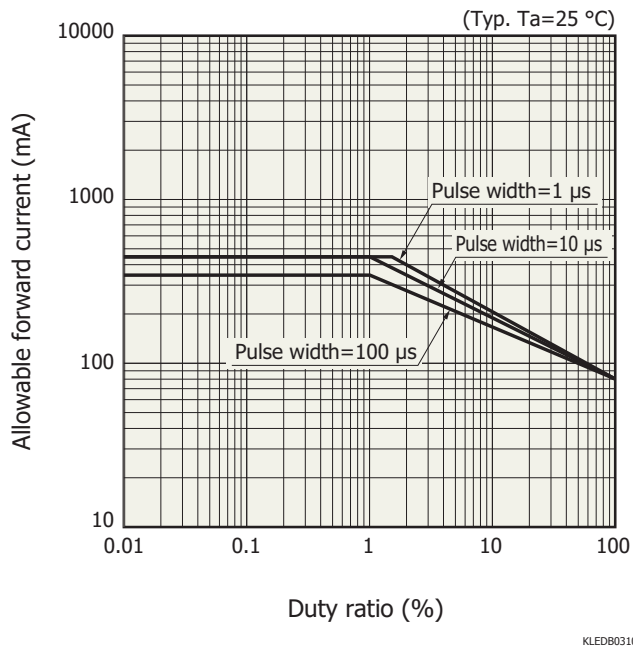
Radiant output vs. ambient temperature



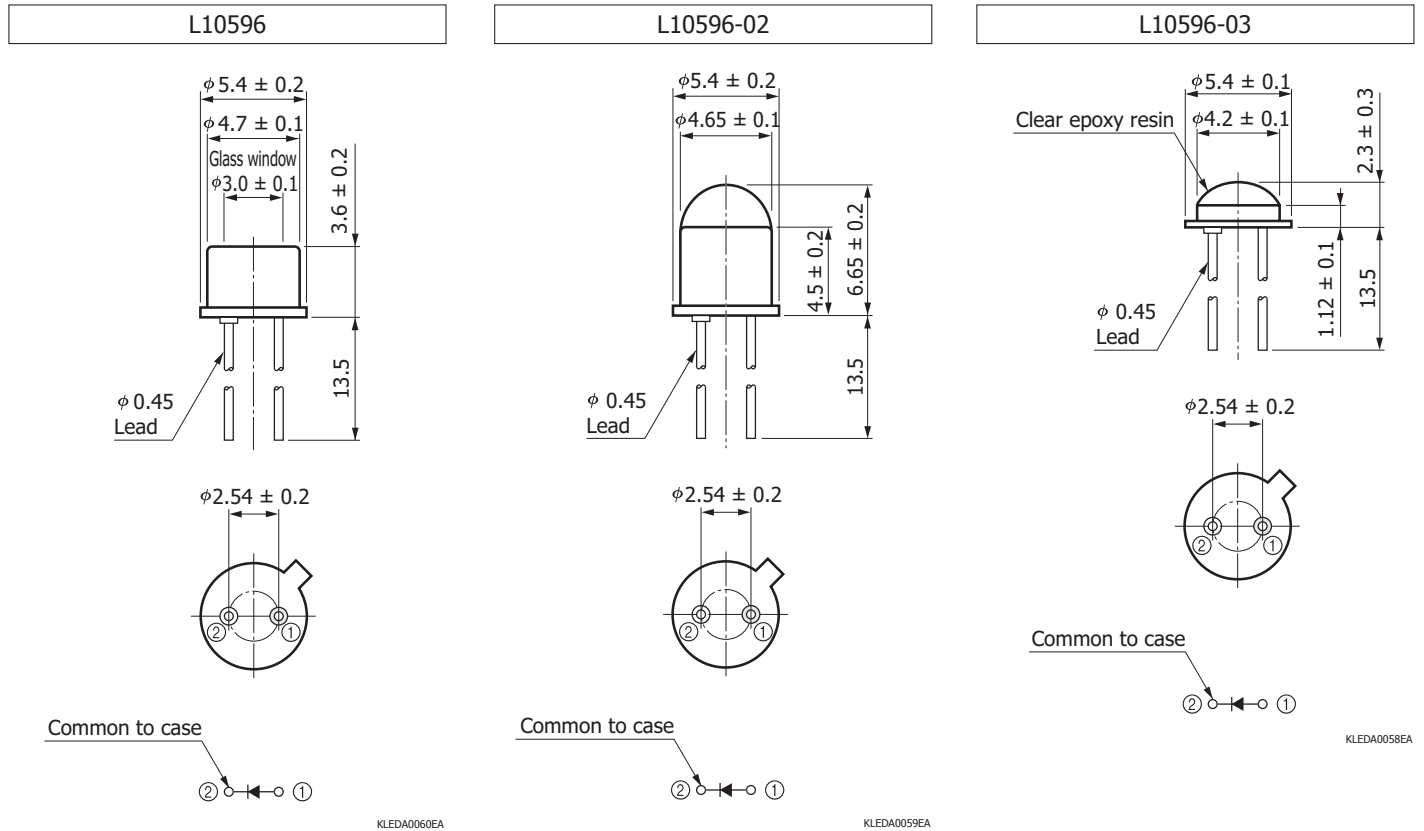
Allowable forward current vs. ambient temperature



Allowable forward current vs. duty ratio



Dimensional outlines (unit: mm)



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