



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 |

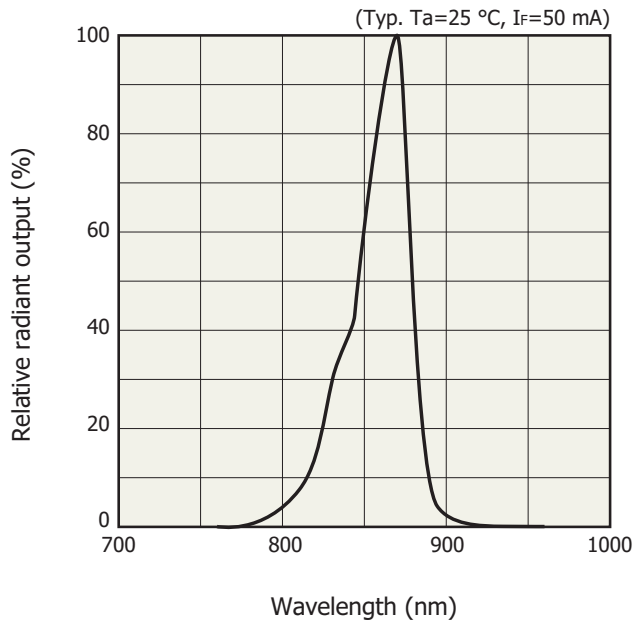
*1: The L10596-03 is guaranteed to resist temperature cycle test of up to 5 cycles.

Electrical and optical characteristics (Ta=25 °C)

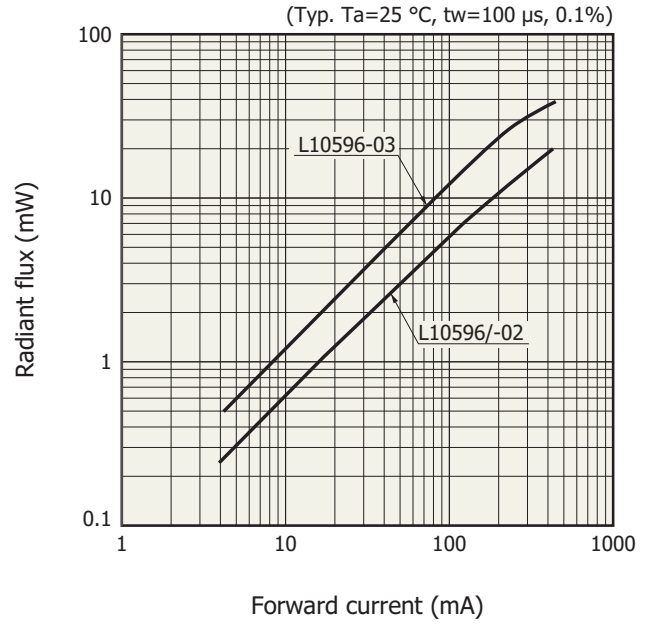
| Parameter | Symbol | Condition | L10596 | | | L10596-02 | | | L10596-03 | | | Unit |
|--------------------------|-----------------|-------------------------|--------|------|------|-----------|------|------|-----------|------|------|---------------|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | 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

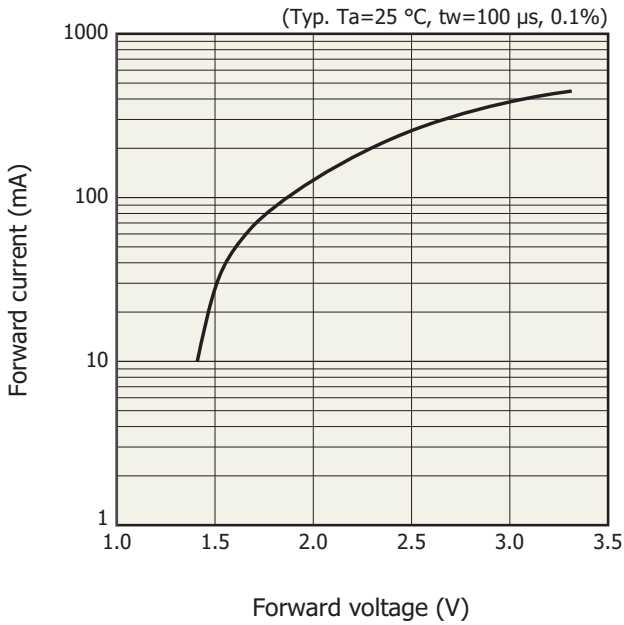
Emission spectrum



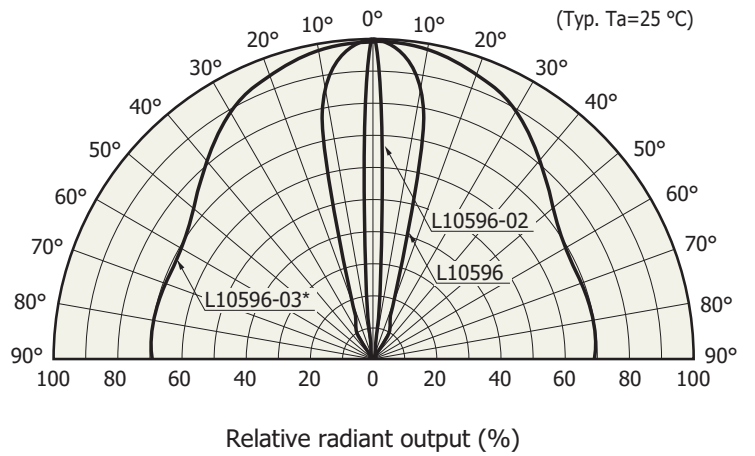
Radiant flux vs. forward current



Forward current vs. forward voltage

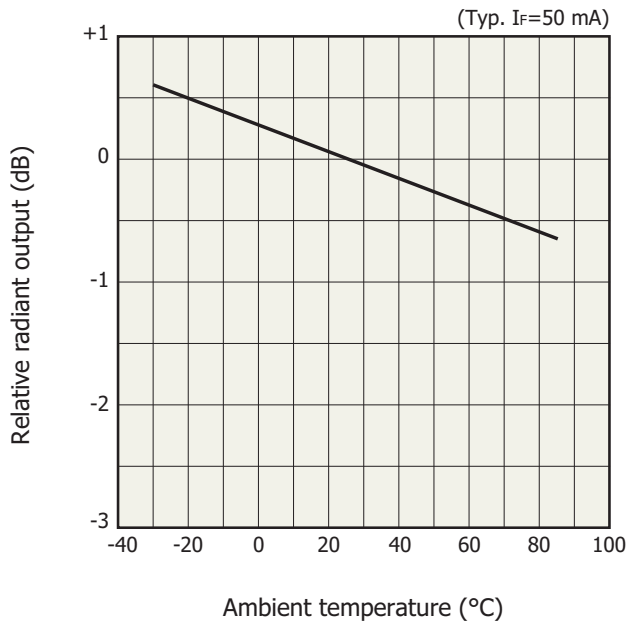


Directivity

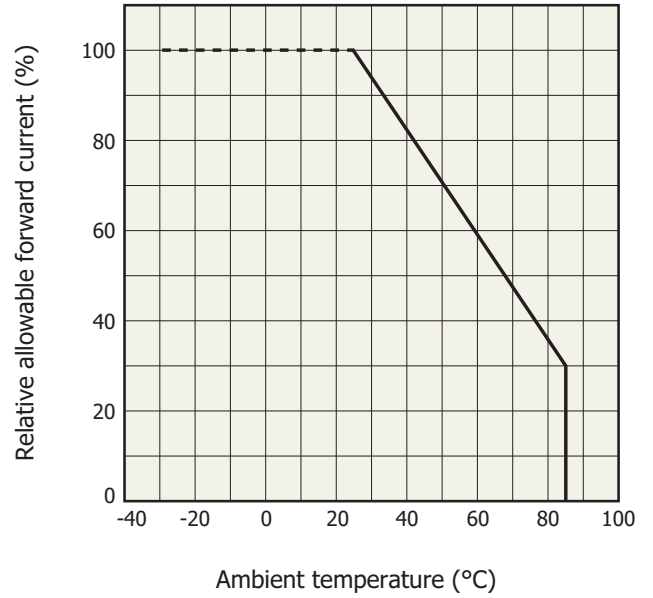


* L10596-03: Except for reflection ingredient of the base

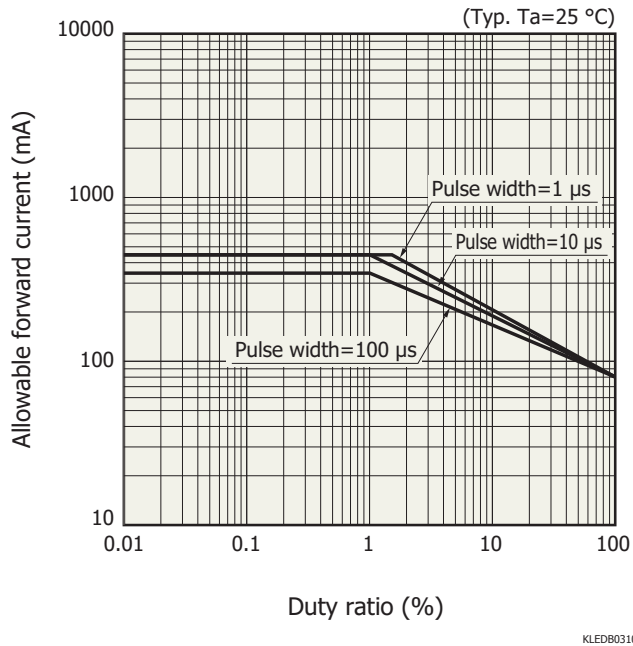
Radiant output vs. ambient temperature



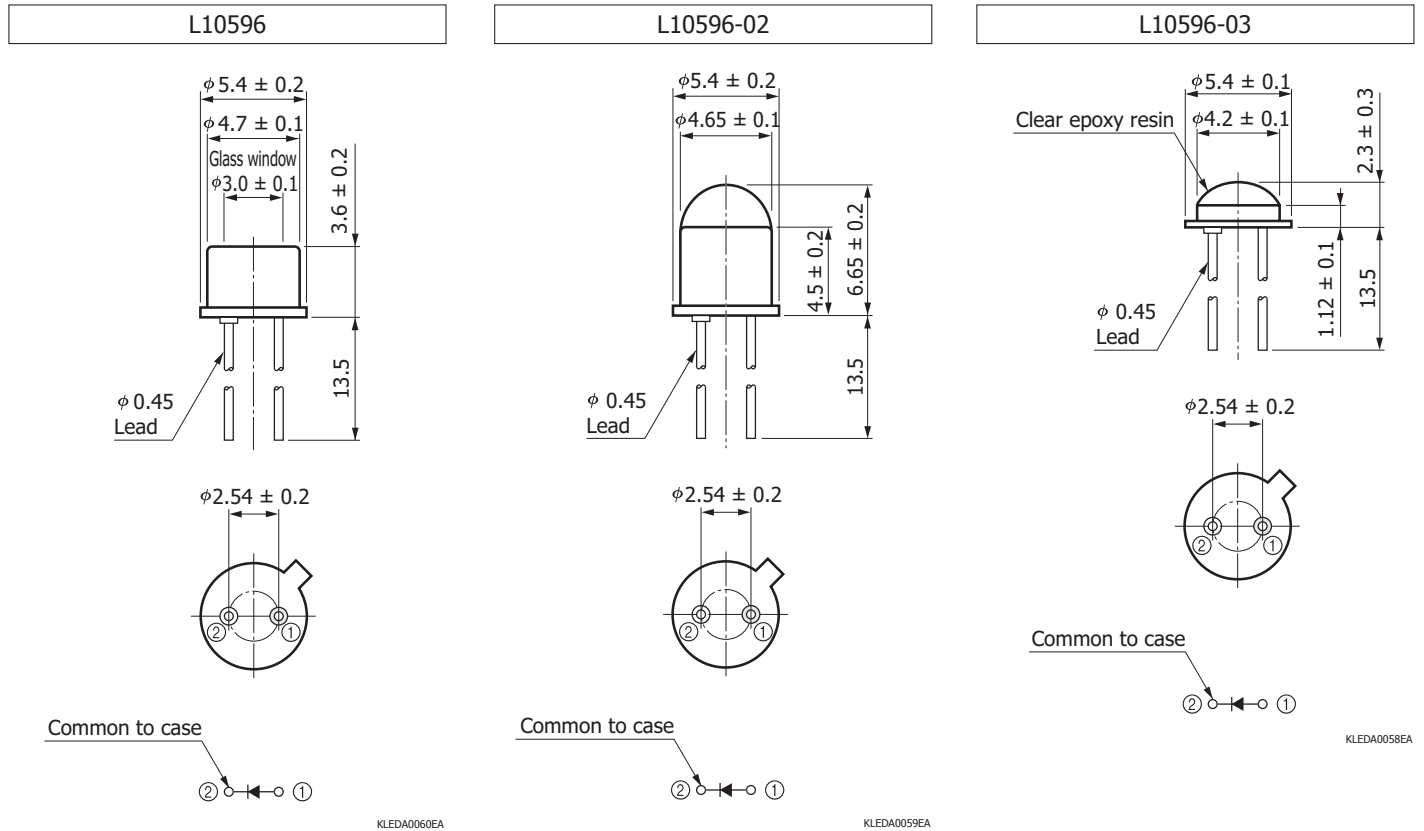
Allowable forward current vs. ambient temperature



Allowable forward current vs. duty ratio



Dimensional outlines (unit: mm)



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