

# GaAlAs-Lumineszenzdiode

## GaAlAs Infrared Emitter

### SFH 460



#### Wesentliche Merkmale

- Hergestellt im Schmelzepitaxieverfahren
- Kathode galvanisch mit dem Gehäuseboden verbunden
- Hohe Zuverlässigkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- Hermetisch dichtes Metallgehäuse
- Gehäusegleich mit SFH 216, SFH 400 und SFH 480

#### Anwendungen

- Lichtschranken für Gleich- und Wechsellichtbetrieb
- IR-Gerätefernsteuerungen
- Sensorik
- Lichtgitter

#### Features

- Fabricated in a liquid phase epitaxy process
- Cathode is electrically connected to the case
- High reliability
- Matches all Si-Photodetectors
- Hermetically sealed package
- Same package as SFH 216, SFH 400 and SFH 480

#### Applications

- Photointerrupters
- IR remote control of various equipment
- Sensor technology
- Light-grille barrier

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 460	Q62702-P478	18 A3 DIN 41876 (TO-18), Bodenplatte, Glaslinse, hermetisch dichtes Gehäuse, Anschlüsse im 2.54-mm-Raster ( $1/10''$ ) 18 A3 DIN 41876 (TO -18), glass lens, hermetically sealed package, lead spacing 2.54 mm ( $1/10''$ )

**Grenzwerte** ( $T_A = 25\text{ °C}$ )**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 100	°C
Sperrspannung Reverse voltage	$V_R$	3	V
Durchlaßstrom Forward current	$I_F$	50	mA
Stoßstrom, $\tau = 10\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	1	A
Verlustleistung Power dissipation	$P_{tot}$	120	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$ $R_{thJC}$	450 160	K/W K/W

**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

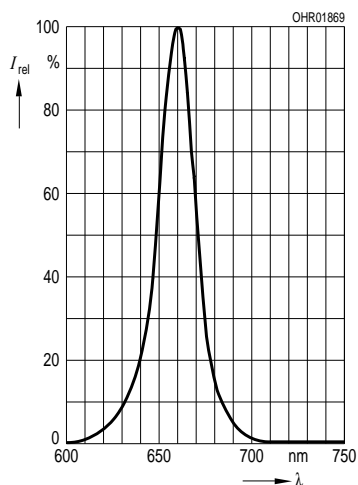
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 50\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{peak}$	660	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 50\text{ mA}$	$\Delta\lambda$	25	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 6$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.106	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.325 \times 0.325$	mm
Abstand Chipoberfläche bis Linsenscheitel Distance chip front to lens top	$H$	4.0 ... 4.8	mm
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 50\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 50\text{ mA}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	100	ns

**Kennwerte** ( $T_A = 25\text{ °C}$ )  
**Characteristics** (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Kapazität, Capacitance $V_R = 0\text{ V}, f = 1\text{ MHz}$	$C_o$	30	pF
Durchlaßspannung, Forward voltage $I_F = 50\text{ mA}, t_p = 20\text{ ms}$	$V_F$	2.1 ( $\leq 2.8$ )	V
Sperrstrom, Reverse current $V_R = 3\text{ V}$	$I_R$	0.01 ( $\leq 10$ )	$\mu\text{A}$
Gesamtstrahlungsfluß, Total radiant flux $I_F = 50\text{ mA}, t_p = 20\text{ ms}$	$\Phi_e$	4	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 50\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 50\text{ mA}$	$TC_I$	- 0.4	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 50\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 50\text{ mA}$	$TC_V$	- 3	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 50\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 50\text{ mA}$	$TC_\lambda$	+ 0.16	nm/K
Strahlstärke Radiant intensity $I_F = 50\text{ mA}, t_p = 20\text{ ms}$	$I_{e\text{ min}}$	16	mW/sr

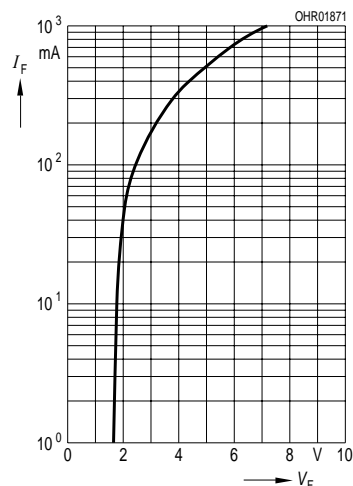
**Relative Spectral Emission**

$I_{rel} = f(\lambda)$



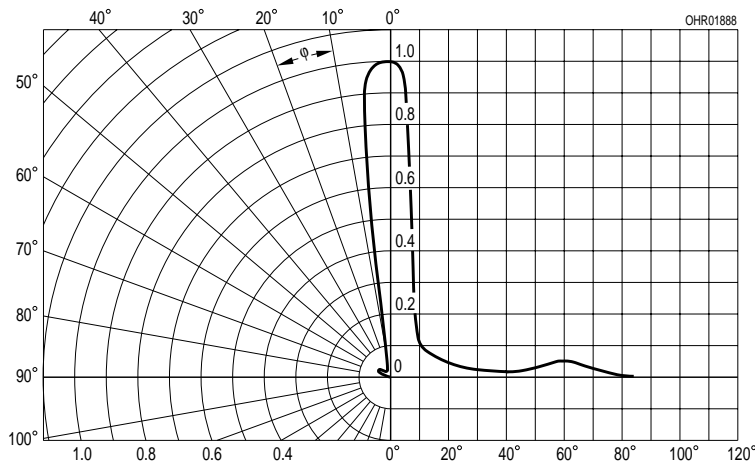
**Forward Current**

$I_F = f(V_F)$ , single pulse,  $\tau = 20 \mu s$



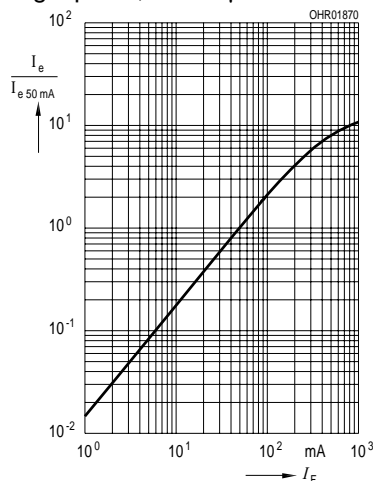
**Directional Characteristics**

$S_{rel} = f(\varphi)$



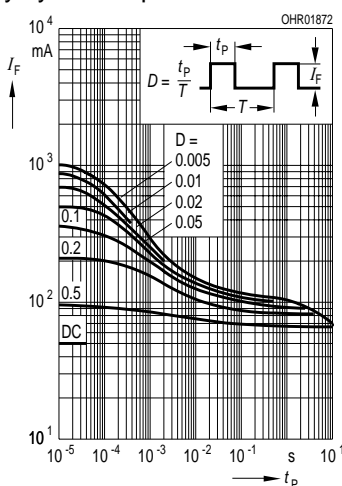
**Radiant Intensity**  $\frac{I_e}{I_{e 50 mA}} = f(I_F)$

Single pulse,  $\tau = 20 \mu s$



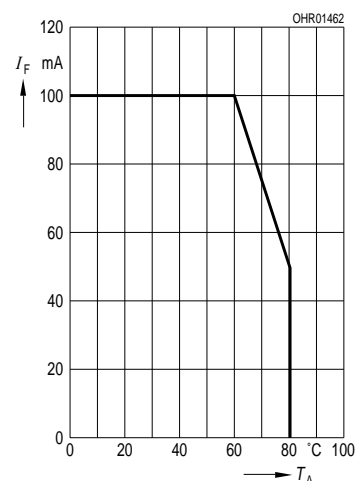
**Permissible Pulse Handling Capability**

$I_F = f(\tau)$ ,  $T_C = 25 \text{ }^\circ\text{C}$ , duty cycle  $D = \text{parameter}$



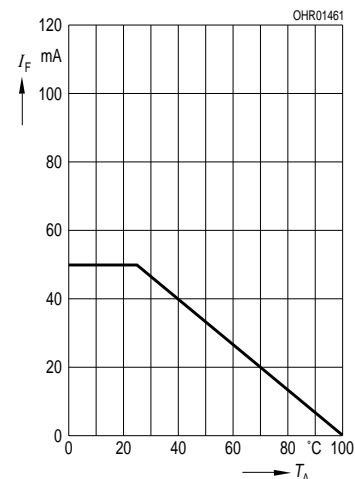
**Max. Permissible Forward Current**

$I_F = f(T_C)$ ,  $R_{thJC} = 160 \text{ k/W}$  mounted on a heat sink

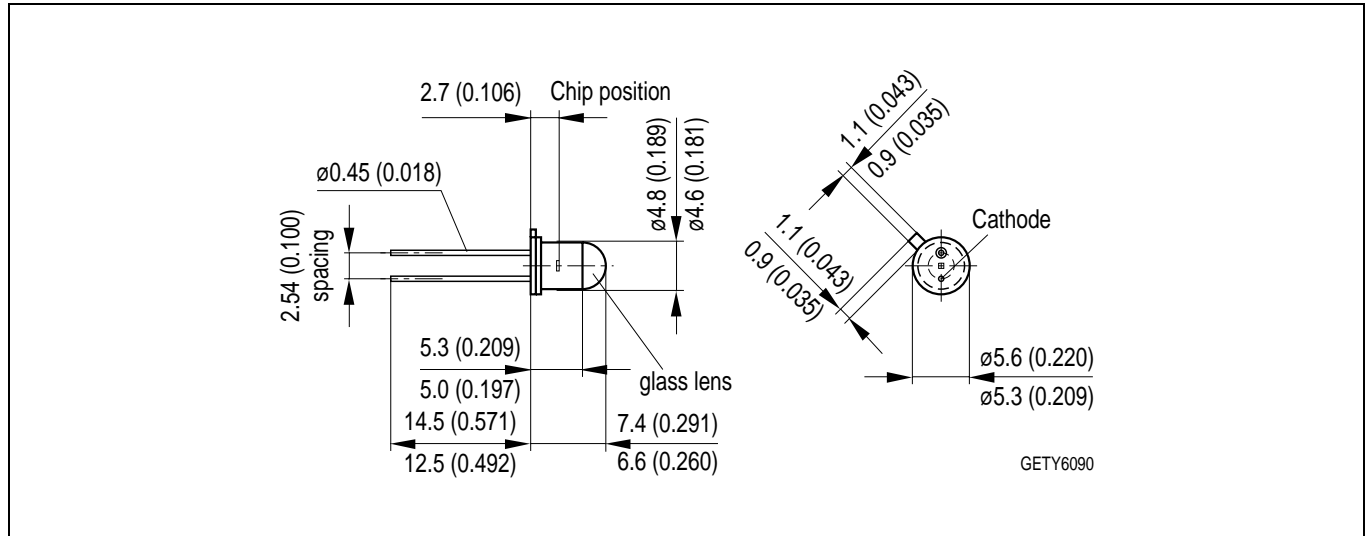


**Max. Permissible Forward Current**

$I_F = f(T_C)$ ,  $R_{thJC} = 450 \text{ k/W}$



## Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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