

# GaAs-IR-Lumineszenzdioden

## GaAs Infrared Emitters

### SFH 415

### SFH 416



SFH 415



SFH 416

#### Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- Hohe Zuverlässigkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- SFH 415: Gehäusegleich mit SFH 300, SFH 203

#### Features

- Very highly efficient GaAs-LED
- High reliability
- Spectral match with silicon photodetectors
- SFH 415: Same package as SFH 300, SFH 203

#### Anwendungen

- IR-Fernsteuerung von Fernseh- und Rundfunkgeräten, Videorecordern, Lichtdimmern
- Gerätefernsteuerungen für Gleich- und Wechsellichtbetrieb
- Sensorik
- Diskrete Lichtschranken

#### Applications

- IR remote control of hi-fi and TV-sets, video tape recorders, dimmers
- Remote control for steady and varying intensity
- Sensor technology
- Discrete interrupters

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 415	Q62702-P296	5-mm-LED-Gehäuse (T 1 <sup>3</sup> / <sub>4</sub> ), schwarz eingefärbt, Anschluß im 2.54-mm-Raster (1 <sup>1</sup> / <sub>10</sub> " ), Kathodenkennzeichnung: kürzerer Anschluß 5 mm LED package (T 1 <sup>3</sup> / <sub>4</sub> ), black-colored epoxy resin lens, solder tabs lead spacing 2.54 mm (1 <sup>1</sup> / <sub>10</sub> " ), cathode marking: short lead
SFH 415-U	Q62702-P1137	
SFH 416-R	Q62702-P1139	

**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	$V_R$	5	V
Durchlaßstrom Forward current	$I_F$	100	mA
Stoßstrom, $t_p = 10\text{ }\mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	3	A
Verlustleistung Power dissipation	$P_{tot}$	165	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	450	K/W

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{peak}$	950	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\text{ mA}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle SFH 415 SFH 416	$\varphi$ $\varphi$	$\pm 17$ $\pm 28$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimensions of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm
Abstand Chipoberfläche bis Linsenscheitel Distance chip front to lens top SFH 415 SFH 416	$H$ $H$	$4.2 \dots 4.8$ $3.4 \dots 4.0$	mm mm

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics (cont'd)

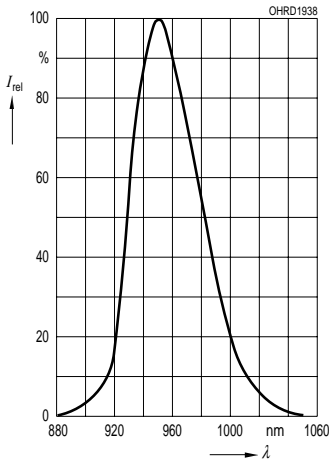
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	0.5	$\mu\text{s}$
Kapazität, Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	25	$\text{pF}$
Durchlaßspannung, Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.3 ( $\leq 1.5$ ) 2.3 ( $\leq 2.8$ )	V V
Sperrstrom, Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluß, Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	22	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.5	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 2	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

**Gruppierung der Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Grouping of Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

Bezeichnung Parameter	Symbol	Wert Value			Einheit Unit
		SFH 415	SFH 415-U	SFH 416-R	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	$\geq 25$ –	$> 40$ –	$> 10$ –	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	–	600	150	mW/sr

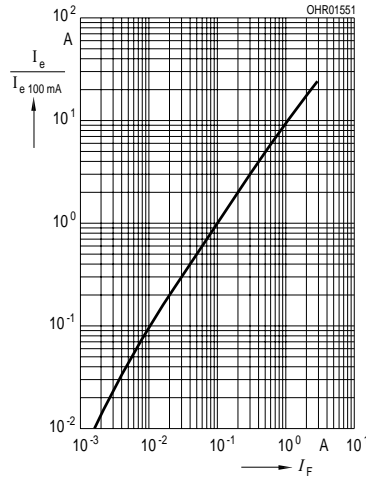
**Relative Spectral Emission**

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



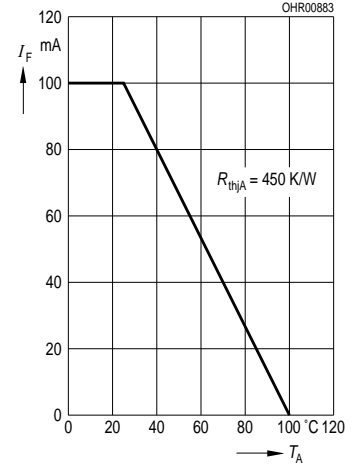
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 20 \mu\text{s}$



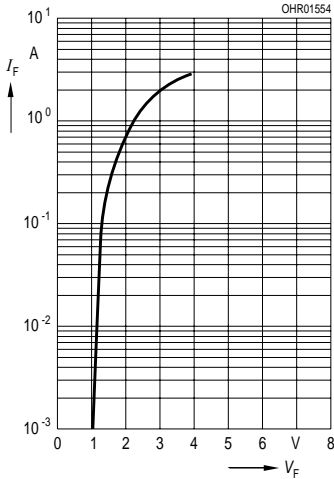
**Max. Permissible Forward Current**

$I_F = f(T_A)$



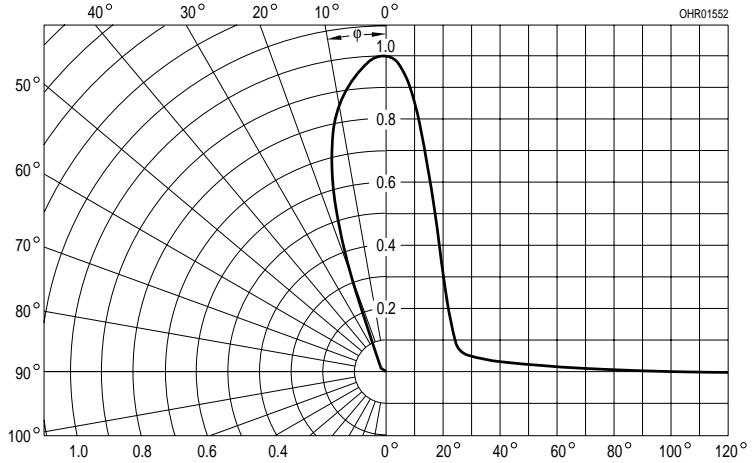
**Forward Current**

$I_F = f(V_F)$ , single pulse,  $t_p = 20 \mu\text{s}$



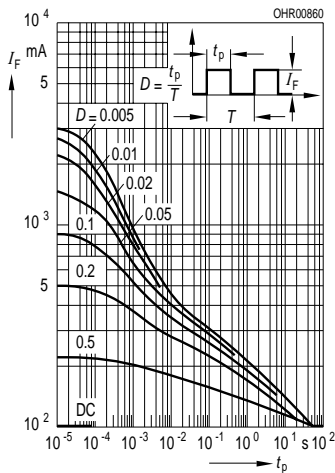
**Radiation Characteristics, SFH 415**

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



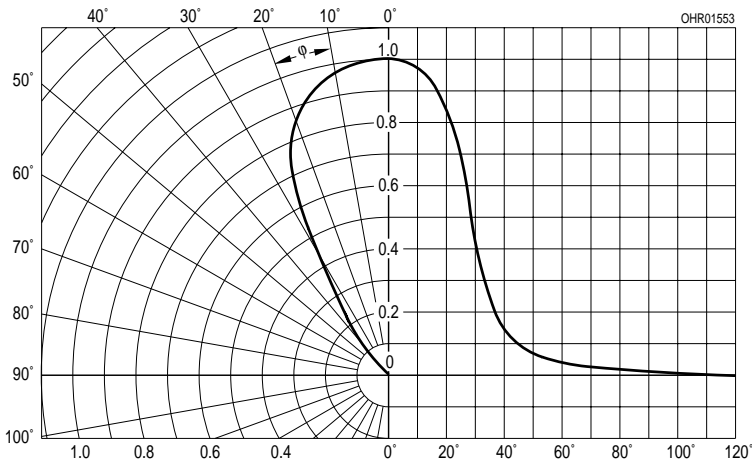
**Permissible Pulse Handling Capability**

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

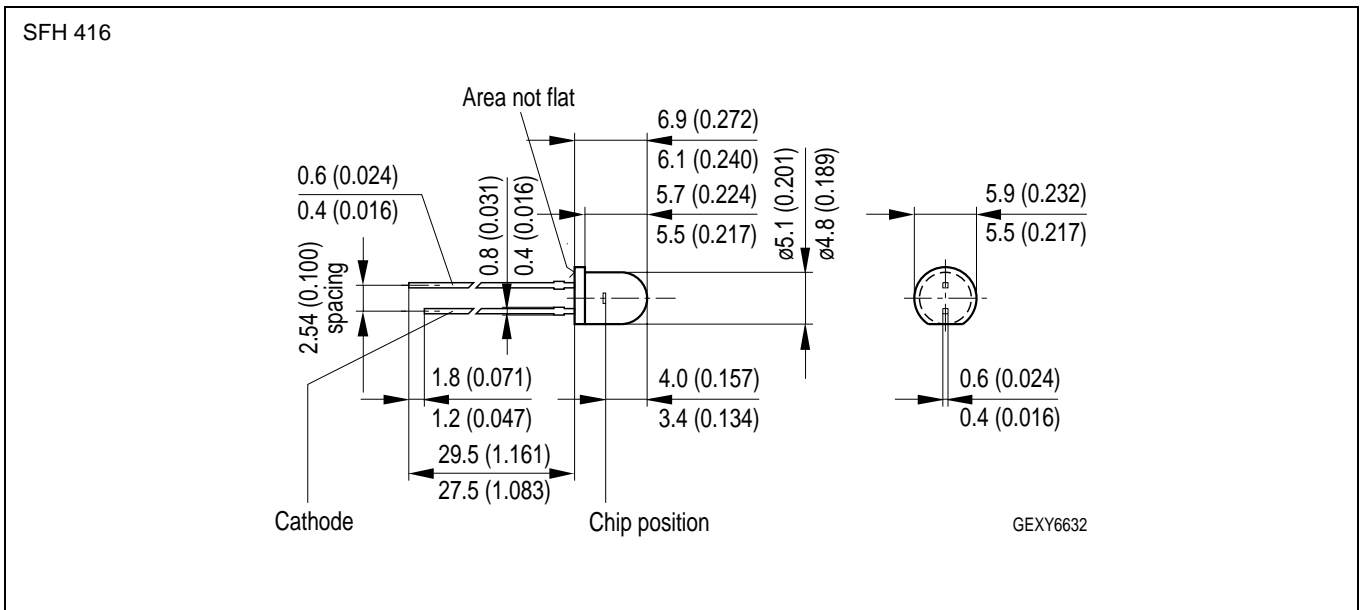
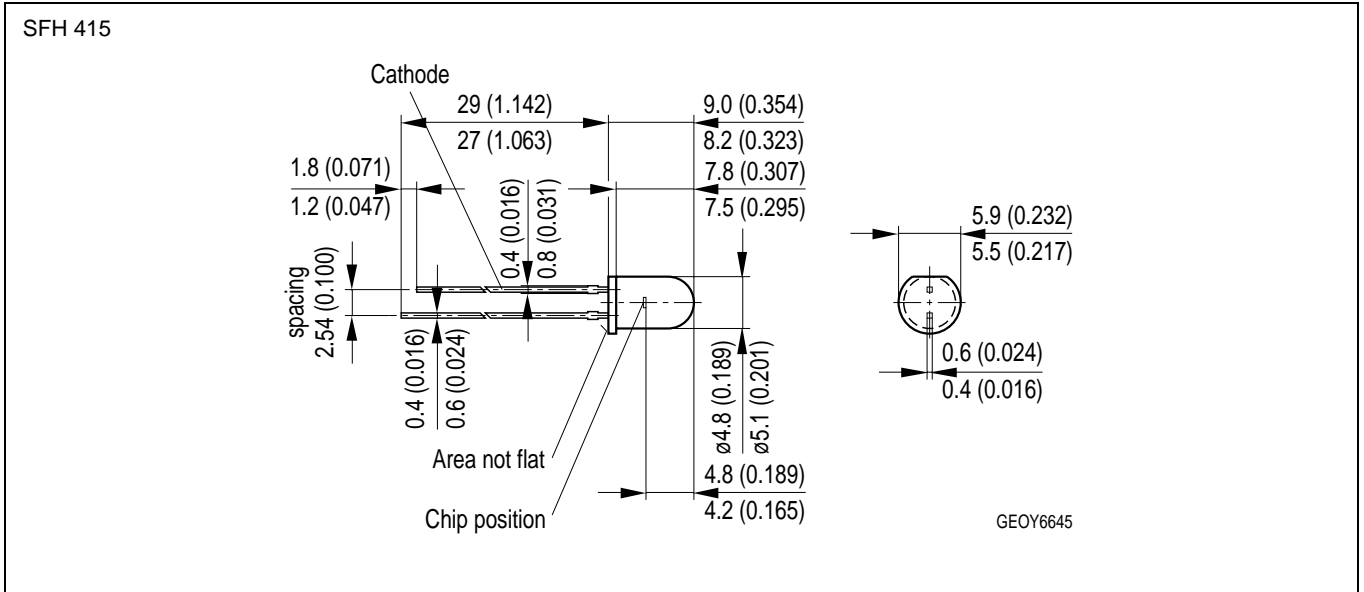


**Radiation Characteristics, SFH 416**

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



Maßzeichnung  
Package Outlines



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

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