

**GaAs-IR-Lumineszenzdioden**  
**GaAs Infrared Emitters**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 415**



**Wesentliche Merkmale**

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

**Features**

- Very highly efficient GaAs-LED
- High reliability
- UL version available
- 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
- Rauchmelder
- Sensorik
- Diskrete Lichtschranken

**Applications**

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

<b>Type</b> <b>Type</b>	<b>Bestellnummer</b> <b>Ordering Code</b>	<b>Strahlstärkegruppierung<sup>1)</sup></b> ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ ) <b>Radiant Intensity Grouping<sup>1)</sup></b> $I_e \text{ (mW/sr)}$
SFH 415	Q62702-P0296	> 25
SFH 415-U	Q62702-P1137	> 40

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.01 \text{ sr}$  / measured at a solid angle of  $\Omega = 0.01 \text{ sr}$

**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, $t_p = 10\ \mu\text{s}$ , $D = 0$ 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	$\varphi$	$\pm 17$	Grad
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 <sup>2</sup>
Abstand Chipoberfläche bis Linsenscheitel Distance chip front to lens top	$H$	4.2 ... 4.8	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 ( $\leq 2.8$ )	$\text{V}$ $\text{V}$
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	$\text{mW}$
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	$\text{mV/K}$
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	$\text{nm/K}$

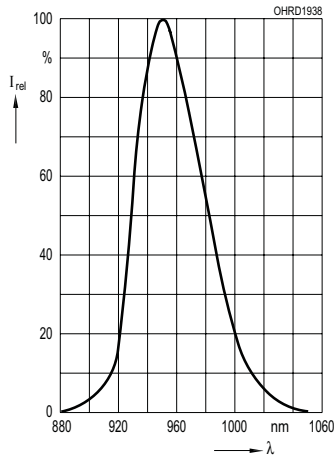
**Gruppierung der Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Grouping of Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

Bezeichnung Parameter	Symbol	Wert Value			Einheit Unit
		SFH 415	SFH 415-T <sup>1)</sup>	SFH 415-U	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	25 –	25 50	40 –	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	–	350	450	mW/sr

<sup>1)</sup> SFH 415-T kann nicht einzeln bestellt werden. / SFH 415-T can not be ordered separately.

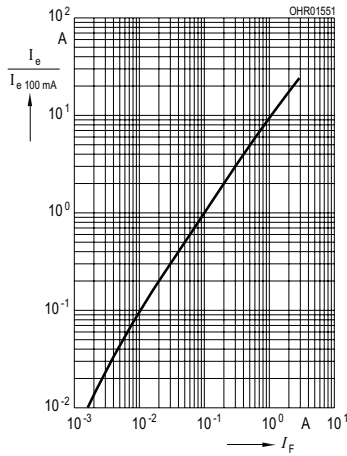
**Relative Spectral Emission**

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



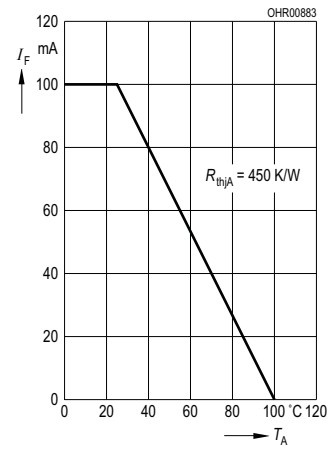
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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



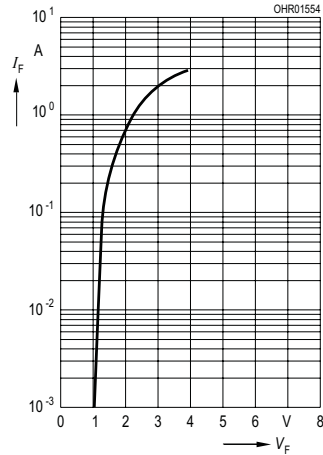
**Max. Permissible Forward Current**

$I_F = f(T_A)$



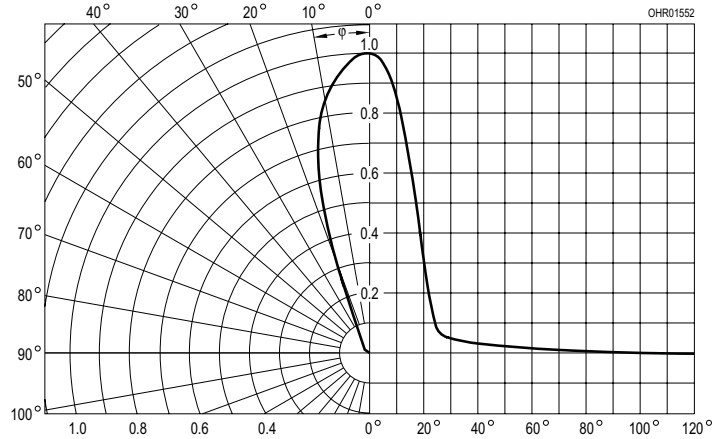
**Forward Current**

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



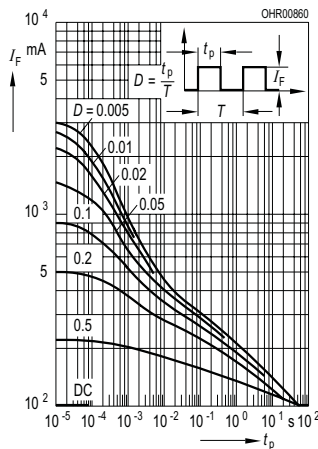
**Radiation Characteristics,**

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

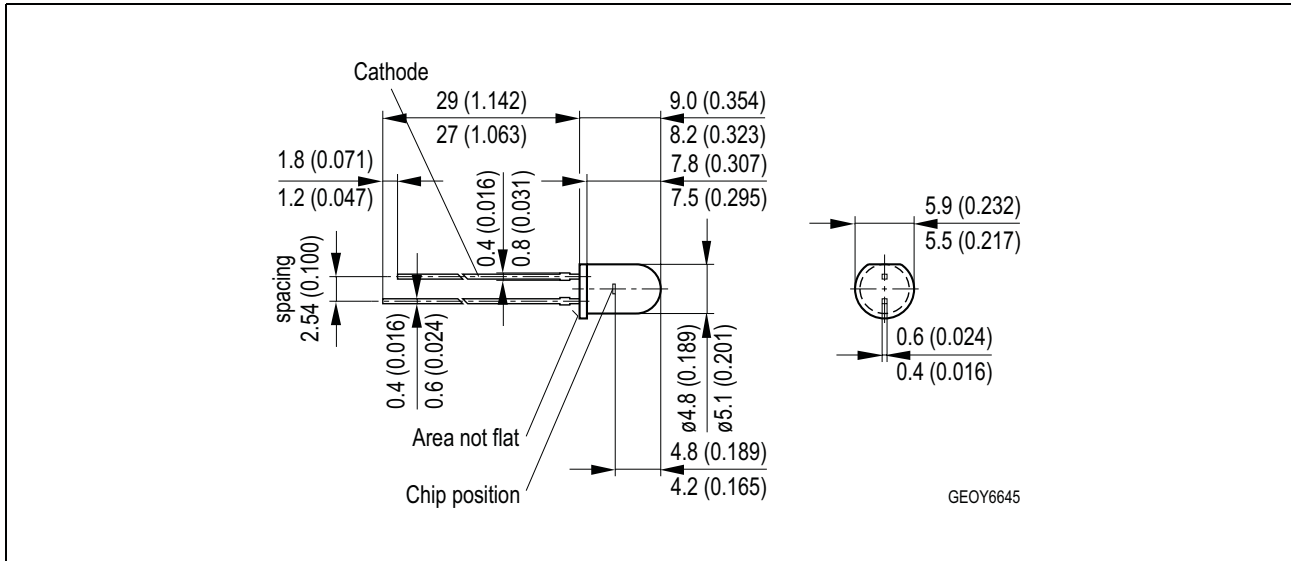


**Permissible Pulse Handling Capability**

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



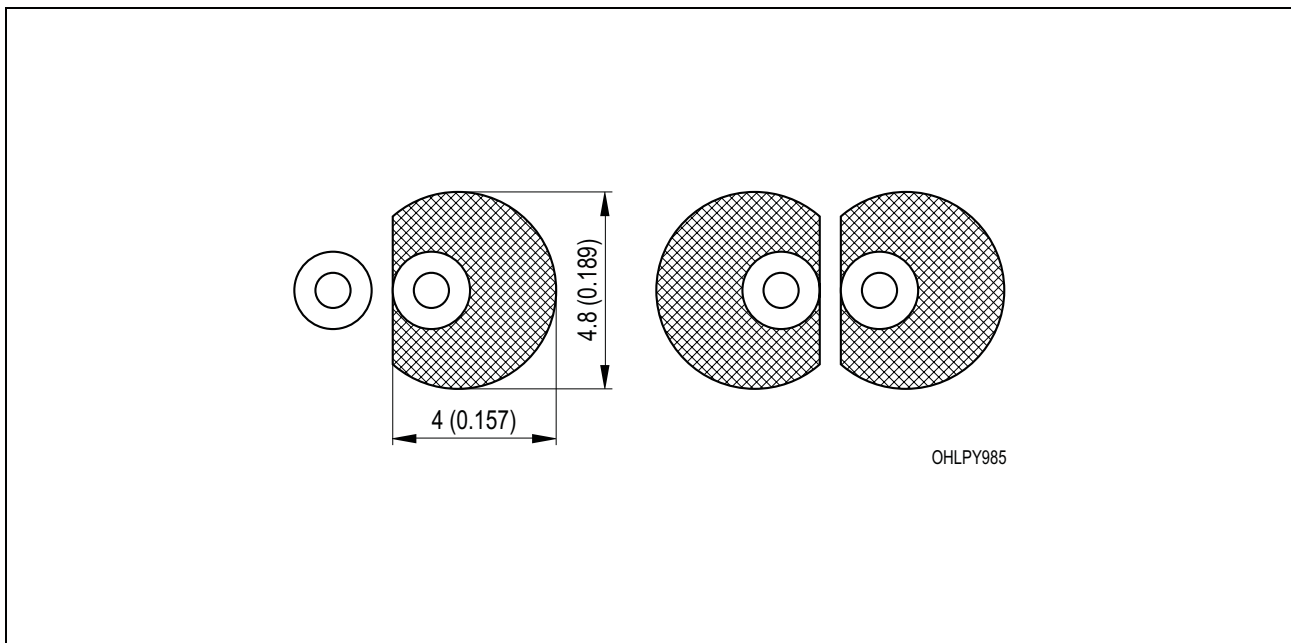
**Maßzeichnung  
Package Outlines**



Maße in mm (inch) / Dimensions in mm (inch).

**Empfohlenes Lötpaddesign  
Recommended Solder Pad**

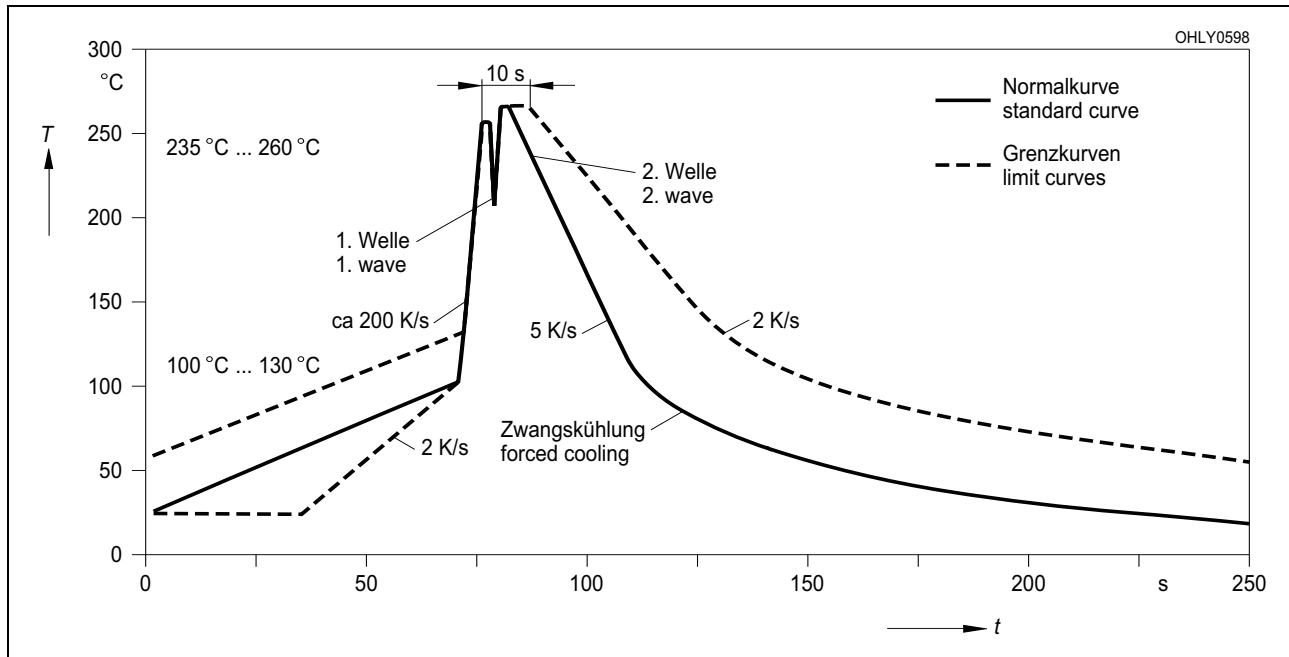
**Wellenlöten (TTW)  
TTW Soldering**



Maße in mm (inch) / Dimensions in mm (inch).

**Lötbedingungen**  
**Soldering Conditions**  
**Wellenlöten (TTW)**  
**TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



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