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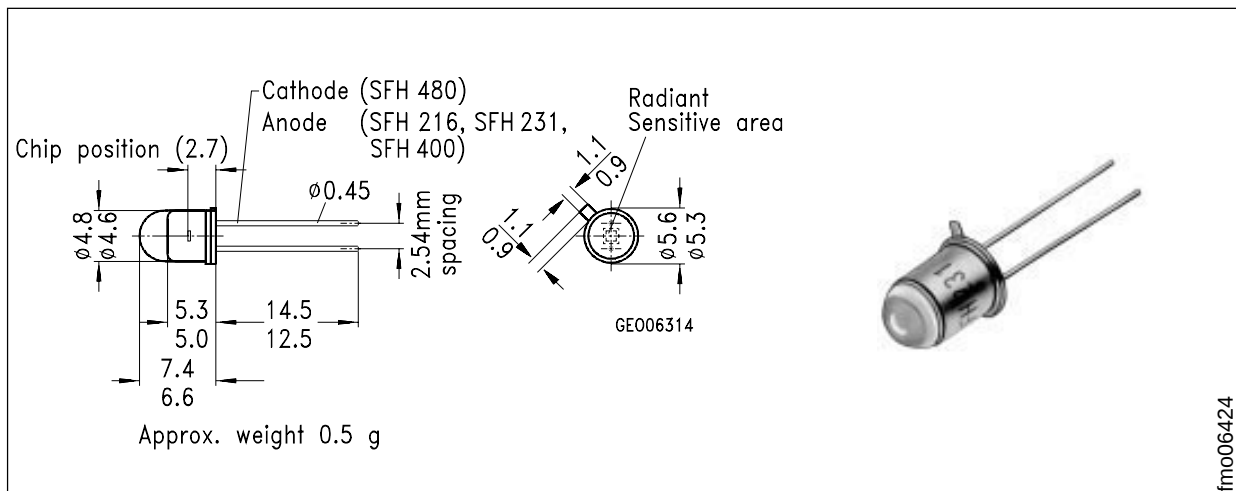
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Germanium-PIN-Fotodiode Germanium PIN Photodiode

SFH 231



Maße in mm, wenn nicht anders angegeben/Dimensions in mm, unless otherwise specified.

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 600 nm bis 1800 nm
- Kurze Schaltzeit (typ. 9 ns)
- Hermetisch dichte Metallbauform (ähnlich TO-18)

Anwendungen

- Meß-, Steuer- und Regelzwecke
- Spektralphotometer
- IR-Laserdetektorsysteme
- IR-Entfernungsmeßeinrichtungen
- Optische Nachrichtenübertragung und Meßgeräte

Features

- Especially suitable for applications from 600 nm to 1800 nm
- Short switching time (typ. 9 ns)
- Hermetically sealed metal package (similar to TO-18)

Applications

- For control and drive circuits
- Spectrophotometers
- IR laser detector systems
- IR distance measuring equipment
- Optical information transmission and measuring instruments

Typ Type	Bestellnummer Ordering Code
SFH 231	Q62702-P1052

Grenzwerte Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 80	°C
Sperrspannung Reverse voltage	V_R	15	V
Verlustleistung, $T_A = 25\text{ °C}$ Total power dissipation	P_{tot}	150	mW
Wärmewiderstand Thermal resistance	R_{thJA}	450	K/W

Kennwerte ($T_A = 25\text{ °C}$, $\lambda = 1300\text{ nm}$) Characteristics

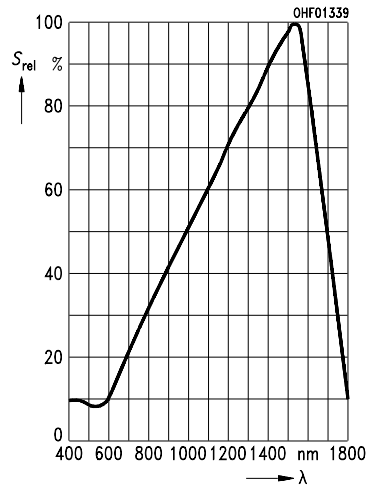
Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Fotoempfindlichkeit Spectral sensitivity Normlicht/standard light A, $T = 2856\text{ K}$ $V_R = 0\text{ V}$	S_v	130	nA/lx
Fotoempfindlichkeit Spectral sensitivity $V_R = 0\text{ V}$, $E_e = 0.25\text{ mW/cm}^2$	S_e	13 (≥ 8)	μA
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	1550	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\text{ \%}$ von S_{max} Spectral range of sensitivity $S = 10\text{ \%}$ of S_{max}	λ	600 ... 1800	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	1	mm^2
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	1×1	mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	H	4.2 ... 5	mm

Kennwerte ($T_A = 25\text{ °C}$, $\lambda = 1300\text{ nm}$)
Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Halbwinkel Half angle	φ	± 10	Grad deg.
Dunkelstrom, $V_R = 1\text{ V}$, $E = 0$ Dark current	I_R	$10 (\leq 50)$	μA
Spektrale Fotoempfindlichkeit, Spectral sensitivity	S_λ	0.68	A/W
Quantenausbeute Quantum yield	η	0.65	<u>Electrons</u> Photon
Kurzschlußstrom, $E_e = 0.25\text{ mW/cm}^2$ Short-circuit current	I_{SC}	$13 (\geq 8)$	μA
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 50\text{ }\Omega$; $V_R = 1\text{ V}$; $I_p = 100\text{ }\mu\text{A}$	t_r, t_f	9	ns
Durchlaßspannung, $I_F = 100\text{ mA}$, $E = 0$ Forward voltage	V_F	1	V
Kapazität, $V_R = 1\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_1	62	pF
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 1\text{ V}$	NEP	2.6×10^{-12}	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 1\text{ V}$ Detection limit	D^*	3.8×10^{10}	$\frac{\text{cm} \cdot \sqrt{\text{Hz}}}{\text{W}}$

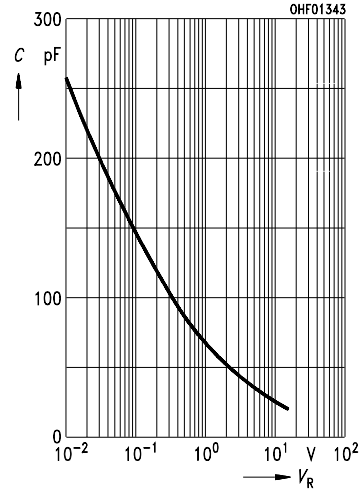
Relative spectral sensitivity

$$S_{\text{rel}} = f(\lambda)$$



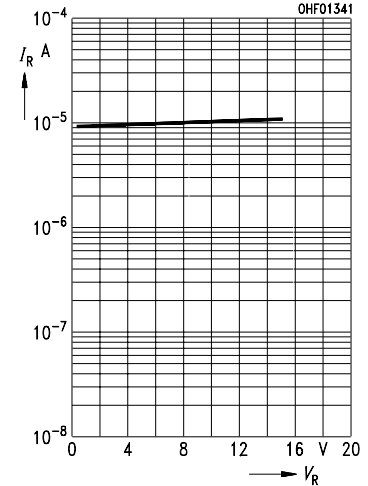
Capacitance

$$C = f(V_R), f = 1 \text{ MHz}, E = 0$$



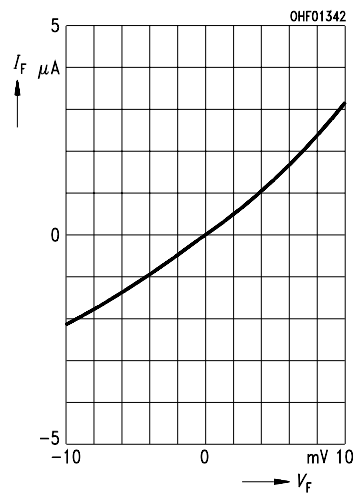
Dark current

$$I_R = f(V_R), E = 0$$



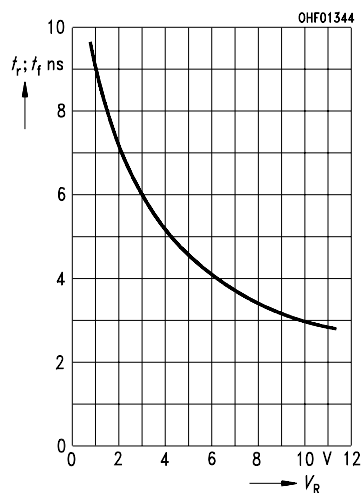
Zero crossover

$$I_F = f(V_F), E = 0$$



Switching times

$$t_r/t_f = f(V_R), R_L = 50 \Omega$$



Directional characteristics $S_{\text{rel}} = f(\varphi)$

