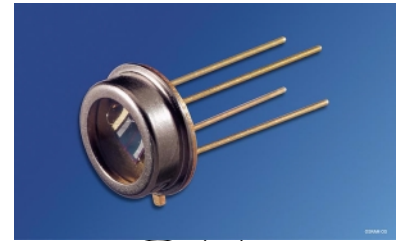


Silizium-Differential-Fotodiode Silicon Differential Photodiode

SFH 221



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm
- Hohe Fotoempfindlichkeit
- Hermetisch dichte Metallbauform (ähnlich TO-5), geeignet bis 125 °C
- Doppeldiode von extrem hoher Gleichmäßigkeit

Anwendungen

- Nachlaufsteuerungen
- Kantenführung
- Industrieelektronik
- „Messen/Steuern/Regeln“

Features

- Especially suitable for applications from 400 nm to 1100 nm
- High photosensitivity
- Hermetically sealed metal package (similar to TO-5), suitable up to 125 °C
- Double diode with extremely high homogeneity

Applications

- Follow-up controls
- Edge drives
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 221	Q62702-P270	Lötspieße im 5.08-mm-Raster (² / ₁₀ "") solder tabs 5.08 mm (² / ₁₀ "") lead spacing

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 125	°C
Löttemperatur (Lötstelle 2 mm vom Gehäuse entfernt bei Lötzeit $t \leq 3$ s) Soldering temperature in 2 mm distance from case bottom ($t \leq 3$ s)	T_S	230	°C
Sperrspannung Reverse voltage	V_R	10	V
Isolationsspannung gegen Gehäuse Insulation voltage vs. package	V_{IS}	100	V
Verlustleistung, $T_A = 25$ °C Total power dissipation	P_{tot}	50	mW

Kennwerte ($T_A = 25$ °C, Normlicht A, $T = 2856$ K) für jede Einzeldiode

Characteristics ($T_A = 25$ °C, standard light A, $T = 2856$ K) per single diode

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Fotoempfindlichkeit, $V_R = 5$ V Spectral sensitivity	S	24 (≥ 15)	nA/lx
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S \max}$	900	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{\max} Spectral range of sensitivity $S = 10\%$ of S_{\max}	λ	400 ... 1100	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	1.54	mm ²
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	0.7×2.2	mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	H	1.1 ... 1.6	mm
Halbwinkel Half angle	φ	± 55	Grad deg.

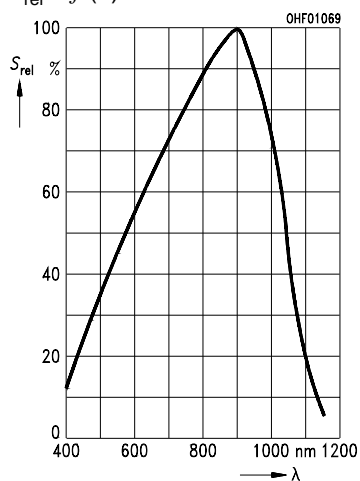
Kennwerte ($T_A = 25\text{ °C}$, Normlicht A, $T = 2856\text{ K}$) für jede Einzeldiode

Characteristics ($T_A = 25\text{ °C}$, standard light A, $T = 2856\text{ K}$) per single diode (cont'd)

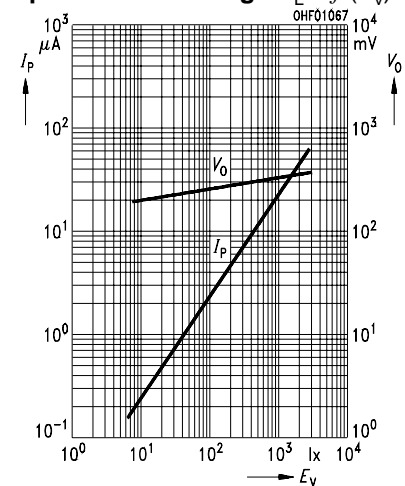
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Dunkelstrom, $V_R = 10\text{ V}$ Dark current	I_R	10 (≤ 100)	nA
Spektrale Fotoempfindlichkeit, $\lambda = 850\text{ nm}$ Spectral sensitivity	S_λ	0.55	A/W
Maximale Abweichung der Fotoempfindlichkeit vom Mittelwert Max. deviation of the system spectral sensitivity from the average	ΔS	± 5	%
Quantenausbeute, $\lambda = 850\text{ nm}$ Quantum yield	η	0.80	<u>Electrons</u> Photon
Leerlaufspannung, $E_v = 1000\text{ lx}$ Open-circuit voltage	V_L	330 (≥ 280)	mV
Kurzschlußstrom, $E_v = 1000\text{ lx}$ Short-circuit current	I_k	24	μA
Isolationsstrom, $V_{IS} = 100\text{ V}$ Insulation current	I_{IS}	0.1 (≤ 1)	nA
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 1\text{ k}\Omega$; $V_R = 5\text{ V}$; $\lambda = 850\text{ nm}$; $I_p = 25\text{ }\mu\text{A}$	t_r, t_f	500	ns
Durchlaßspannung, $I_F = 40\text{ mA}$, $E = 0$ Forward voltage	V_F	1.0	V
Kapazität, $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_0	25	pF
Temperaturkoeffizient für V_L Temperature coefficient of V_L	TC_V	-2.6	mV/K
Temperaturkoeffizient für I_k Temperature coefficient of I_k	TC_I	0.18	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 10\text{ V}$, $\lambda = 850\text{ nm}$	NEP	1.0×10^{-13}	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 10\text{ V}$, $\lambda = 850\text{ nm}$ Detection limit	D^*	1.2×10^{12}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

Relative Spectral Sensitivity

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

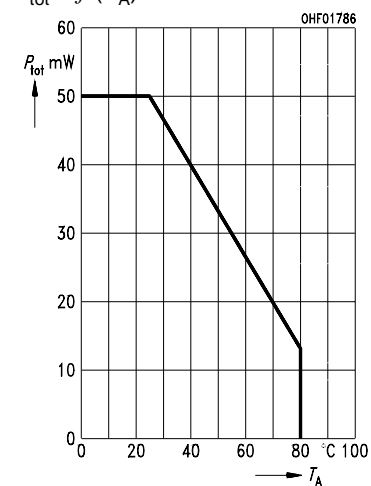


**Photocurrent $I_P = f(E_v)$, $V_R = 5\text{ V}$
Open-Circuit-Voltage $V_o = f(E_v)$**



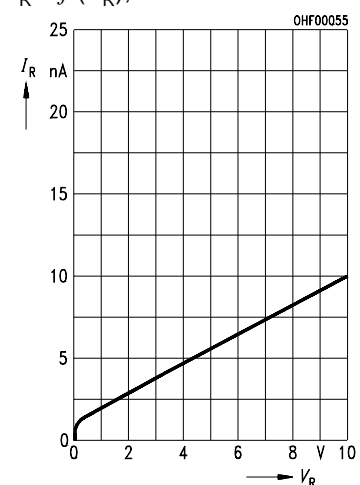
Total Power Dissipation

$P_{tot} = f(T_A)$



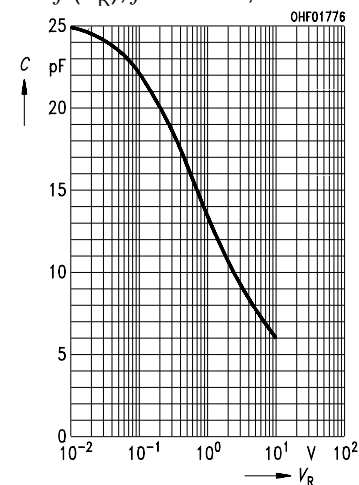
Dark Current

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



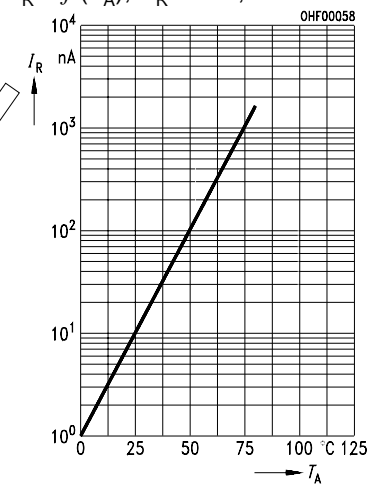
Capacitance

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



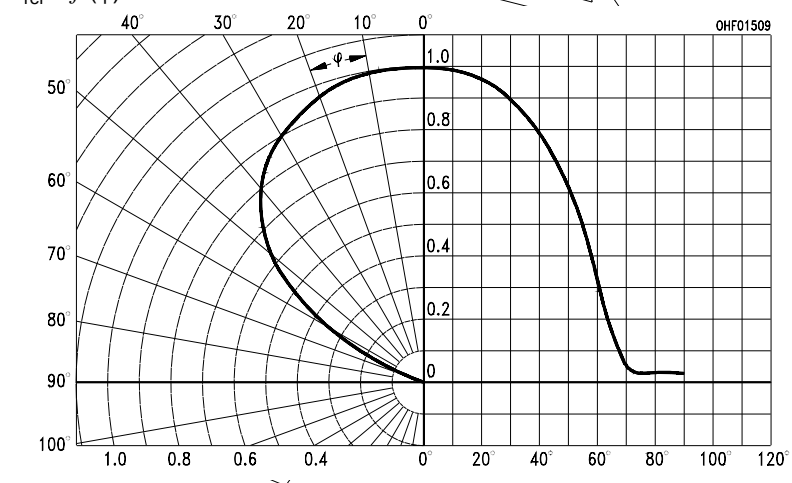
Dark Current

$I_R = f(T_A), V_R = 1\text{ V}, E = 0$

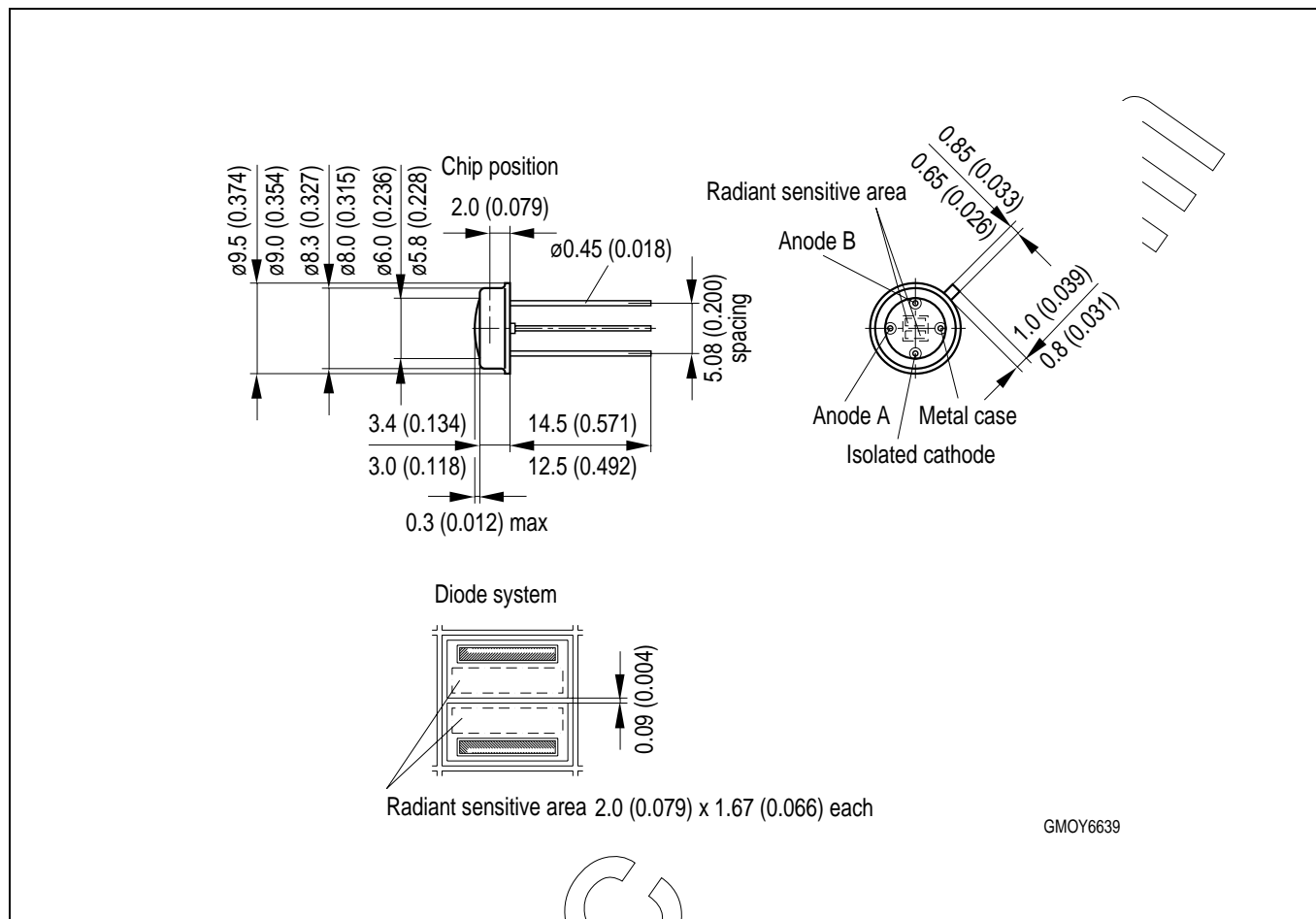


Directional Characteristics

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



Maßzeichnung Package Outlines



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

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