Optoelectronic Devices

Order code	Manufacturer code	Description
58-0470	Q62702-P955	SFH203 T1 3/4 PHOTODIODE (UNFILTERED) RC

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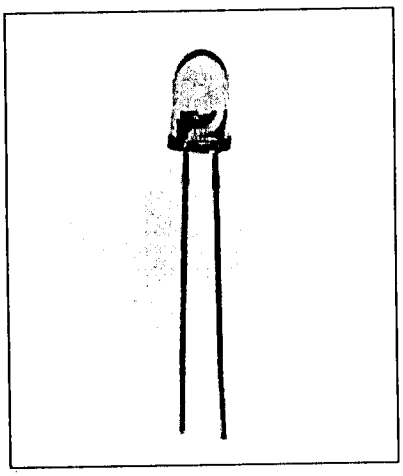
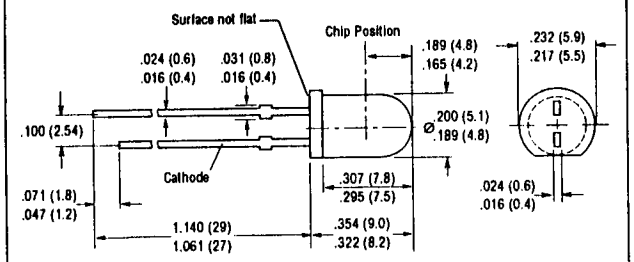


Package Dimensions in Inches (mm)



FEATURES

- **High Reliability**
- **Low Noise**
- **High Open Circuit Voltage as Photovoltaic Cells**
- **Short Switching Time**
- **High Spectral Sensitivity**
- **Wide Temperature Range**
- **Low Capacitance**
- **Usage: Visible and Near IR Ranges**
- **Clear Plastic Lens (SFH 2030)**
- **Daylight Filter Option (SFH 2030F)**

DESCRIPTION

SFH 2030 and SFH 2030F are silicon planar PIN photodiodes in T1$^3/_4$ packages. They can be used as photodiodes with reverse voltage, or as photovoltaic cells. The terminals are solder tabs with 0.1" (2.54 mm) lead spacing.

Applications include industrial electronics, light-activated switches, fiber optic transmission systems, and measurement and control.

Maximum Ratings

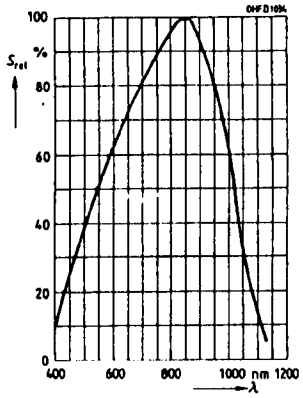
Operating and Storage Temperature Range (T_{OP}, T_{STG}) ..... –55° to +100°C
Soldering Temperature (2 mm from case bottom) (T_s) t≤3 s .... 300°C
Reverse Voltage (V_R) ..... 50 V
Power Dissipation (P_{TOT}) T_A=25°C ..... 100 mW

Characteristics (T_A=25°C)

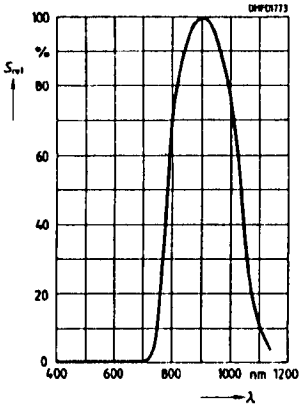
Parameter	Symbol	Value SFH 2030	Value SFH 2030F	Unit
Photosensitivity (V_R=5 V, Standard Light A, T=2856 K)	S	80(≥50)		nA/lx
(V_R=5 V, λ=950 nm, E_e=0.5 mW/cm²)	S		25(≥15)	µA
Maximum Photosensitivity Wavelength	λ_{Smax}	850	900	nm
Photosensitivity Spectral Range (S=10% of S_{MAX})	λ	400 to 1100	800 to 1100	nm
Radiant Sensitive Area	A	1	1	mm²
Radiant Sensitive Area Dimensions	L x W	1 x 1	1 x 1	mm
Distance, Chip Surface to Case Surface	H	4.0 to 4.6	4.0 to 4.6	mm
Half Angle	φ	±20	±20	Deg.
Dark Current (V_R=20 V)	I_R	1(≤5)	1(≤5)	nA
Spectral Sensitivity (λ=850 nm)	S_λ	0.62	0.59	A/W
Quantum Yield (λ=850 nm)	η	0.89	0.86	electrons/photon
Open Circuit Voltage (E_V=1000 lx)(1)	V_0	420(≥350)		mV
(E_e=0.5 mW/cm², λ=950 nm)	V_0		370(≥300)	mV
Short Circuit Current (E_V=1000 lx)(1)	I_{SC}	80		µA
(E_e=0.5 mW/cm², λ=950 nm)	I_{SC}		25	µA
Rise and Fall Time of Photocurrent (R_L=50 Ω, V_R=20 V, λ=850 nm, I_P=800 µA)	t_R, t_F	5	5	ns
Forward Voltage (I_F=80 mA, E=0)	V_F	1.3	1.3	V
Capacitance (V_R=0 V, f=1 MHz, E=0)	C_0	11	11	pF
Temperature Coefficient V_0	TC_V	–2.6	–2.6	mV/K
Temperature Coefficient I_{SC} (Standard Light A)	TC_I	0.18		%/K
Temperature Coefficient I_{SC} (λ=950 nm)	TC_I		0.2	%/K
Noise Equivalent Power (V_R=20 V, λ=850 nm)	NEP	2.9×10^{-14}	2.9×10^{-14}	W/√Hz
Detection Limit (V_R=20 V, λ=850 nm)	D*	3.5×10^{12}	3.5×10^{12}	cm·√Hz/W

Note
1. Illuminance shown refers to unfiltered radiation of tungsten filament lamp at color temperature of 2856 K (standard light A per DIN 5033 and IEC publication 306-1).

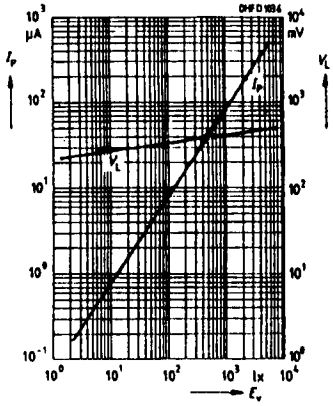
SFH 2030
Relative spectral sensitivity
$S_{REL}=f(\lambda)$



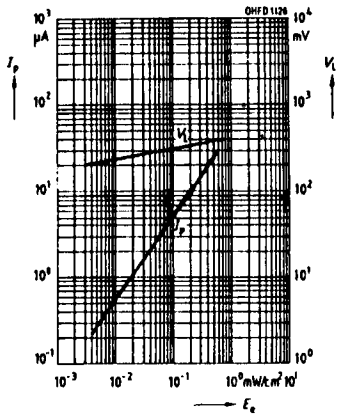
SFH 2030F
Relative spectral sensitivity
$S_{REL}=f(\lambda)$



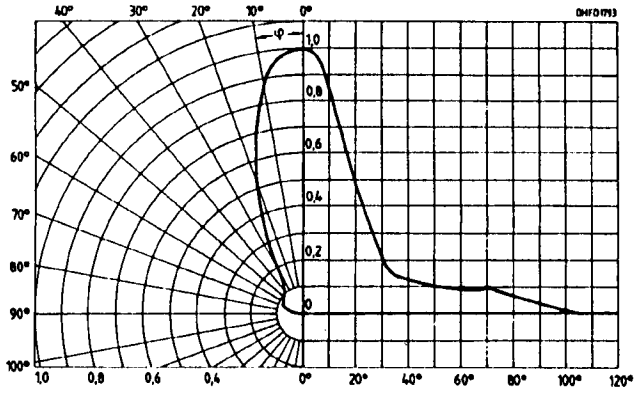
SFH 2030
Photocurrent $I_P=f(E_V)$ $V_R=5$ V
Open circuit voltage $V_O=f(E_V)$



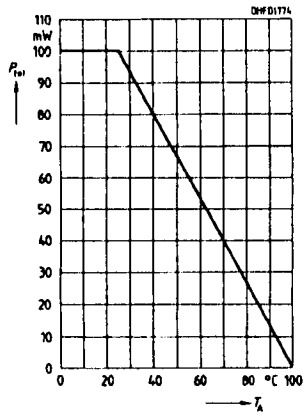
SFH 2030F
Photocurrent $I_P=f(E_e)$ $V_R=5$ V
Open circuit voltage $V_O=f(E_e)$



Directional characteristic $S_{REL}=f(\varphi)$



Power dissipation $P_{TOT}=f(T_A)$



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