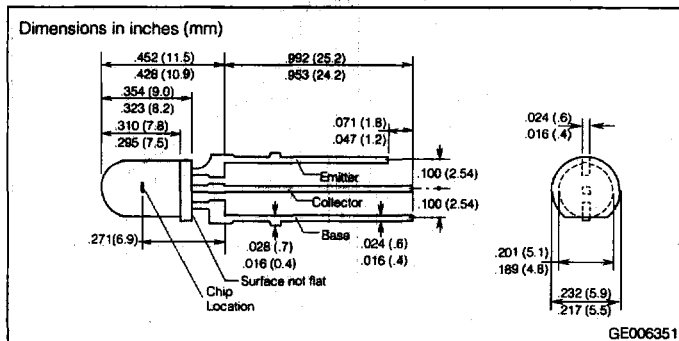
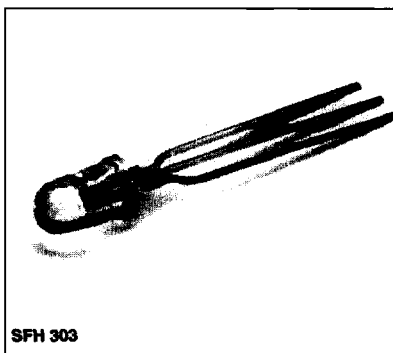


SIEMENS

SFH303 DAYLIGHT FILTER SFH303FA Silicon NPN Phototransistor



FEATURES

- **Especially suitable for applications**
 - SFH 303: 450 nm to 1100 nm
 - SFH 303 FA: 880 nm
- **High linearity**
- **T¹/₄ (5 mm) LED plastic package**
- **Also available on tape**
- **Spectral sensitivity selections**

APPLICATIONS

- **Photointerrupters**
- **Industrial electronics**
- **For control and drive circuits**

DESCRIPTION

The SFH303/303FA are silicon phototransistors with external base connections. The SFH303 comes in a standard T¹/₄ (5 mm) water-clear plastic package. The SFH303FA has a black daylight filter.

The emitter lead is the short lead; the collector lead is the middle lead.

Maximum Ratings

Operating/Storage Temperature Range
 (T_{OP}, T_{STG}) -55° to +100°C

Soldering Temperature
 (≥2 mm from case bottom)
 Dip Soldering (T_S) t_S ≤ 5 s 260°C

Iron Soldering (T_S) t_S ≤ 3 s 300°C

Collector Emitter Voltage (V_{CE}) 50 V

Emitter Base Voltage (V_{EB}) 7 V

Collector Current (I_C) 50 mA

Collector Surge Current (I_{CS}) τ < 10 μs .. 100 mA

Total Power Dissipation
 (P_{TOT}) T_A = 25°C 200 mW

Thermal Resistance (R_{THJA}) 375 K/W

Characteristics T_A = 25°C, λ = 950 nm

Parameter		Sym.	Value	Unit	Condition	
Wavelength, Max. Sensitivity	SFH303	λ_{Smax}	850	nm	S=10% of S_{max}	
	SFH303FA		870			
Spectral Sensitivity Range	SFH303	λ	450 to 1000			
	SFH303FA		720 to 1100			
Radiant Sensitive Area		A	0.20	mm ²		
Radiant Sensitive Area Dimensions		L x W	0.65 x 0.65	mm		
Distance Chip Surface to Case Surface		H	4.0 to 4.6			
Half Angle		ϕ	±20	Deg.		
Photocurrent, Collector Base Photodiode	SFH303	I_{PCB}	15.8	μA	$E_V=1000\text{ lx}$, Std. Light A, $V_{CB}=5\text{ V}$	
	SFH303FA		4.5		$E_e=0.5\text{ mW/cm}^2$, $V_{CB}=5\text{ V}$	
Capacitance, f=1 MHz, E=0		C_{CE}	10	pF	$V_{CE}=0\text{ V}$	
		C_{CB}	15		$V_{CB}=0\text{ V}$	
		C_{EB}	21		$V_{EB}=0\text{ V}$	
Saturation Voltage ⁽¹⁾ , Collector Emitter		V_{CEsat}	150	mV	$I_C=I_{PCBmin} \times 0.3$, $E_e=0.5\text{ mW/cm}^2$	
Parameter	Sym.	-2	-3	-4	Unit	Condition
Photocurrent, $\lambda=950\text{ nm}$	I_{PCE}	1.0 to 2.0	1.6 to 3.2	≥2.5	mA	$E_e=0.5\text{ mW/cm}^2$, $V_{CE}=5\text{ V}$
Photocurrent, $\lambda=950\text{ nm}$, SFH303		5:2	8.4	13.1		$E_V=1000\text{ lx}$, Std. Light A, $V_{CE}=5\text{ V}$
Rise/Fall Time	t_R, t_F	11	13	15	μs	$I_C=1\text{ mA}$, $V_{CC}=5\text{ V}$, $R_L=1\text{ k}\Omega$
Current Gain	I_{PCE}/I_{PCB}	330	530	830		$E_e=0.5\text{ mW/cm}^2$, $V_{CE}=5\text{ V}$

Notes: 1. I_{PCB} E_{min} is the minimum photocurrent of the specified dash number.

Figure 1. Directional characteristic $S_{REL}=f(\varphi)$

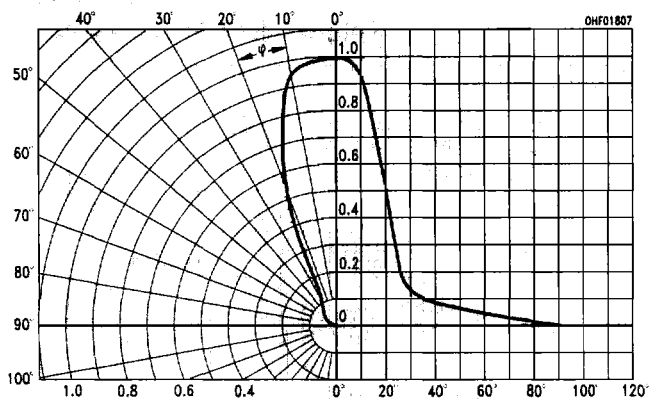


Figure 2. Relative spectral sensitivity —SFH303 $S_{REL}=f(\lambda)$

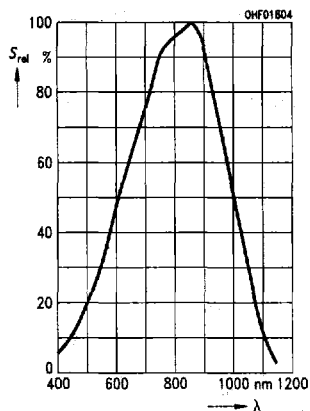


Figure 3. Relative spectral sensitivity —SFH303FA $S_{REL}=f(\lambda)$

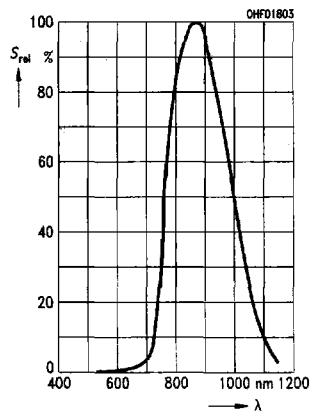


Figure 4. Photocurrent $I_{PCE}=f(E_a), V_{CE}=5V$

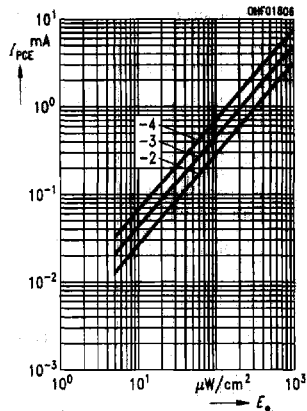


Figure 5. Output characteristics $I_C=f(V_{CE}), I_B=\text{Parameter}$

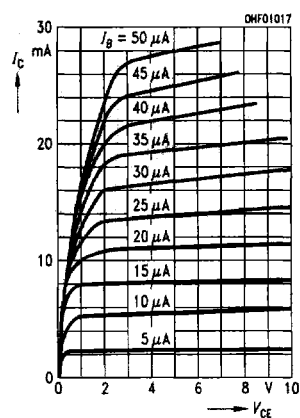


Figure 6. Dark Current $I_{CEO}=f(V_{CE}), E=0$

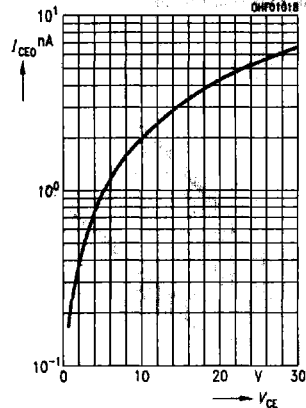
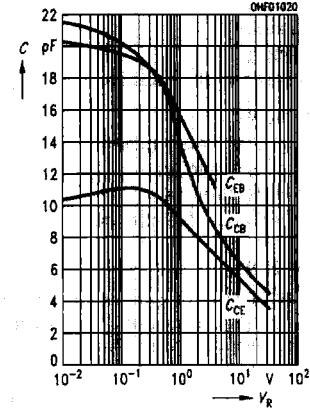


Figure 7. Capacitance $C=f(V), f=1\text{ MHz}, E=0$



Phototransistors