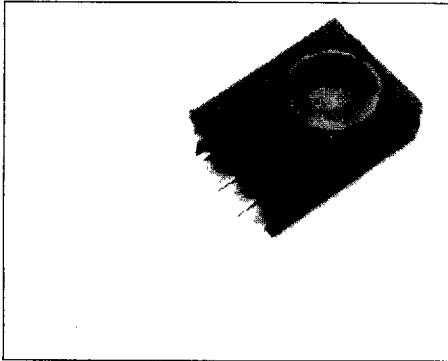


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SFH505A
 IR Receiver/Demodulator Device

T-4(-90



FEATURES

- Photodiode with Hybrid Integrated Circuit
- 30 kHz Carrier Frequency
- Black Epoxy Package with Daylight Filter Optimized for 950 nm
- High Immunity Against Ambient Light
- Low Power Consumption
- 5 V Supply Voltage
- High Sensitivity
- Internal EMI/RFI Shield

DESCRIPTION

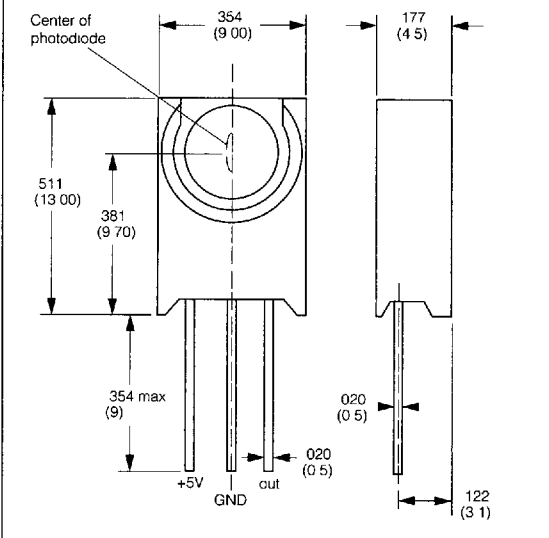
The SFH505A incorporates a silicon PIN photodiode, IR detector IC, and demodulator in a lensed and filtered plastic housing. The device is compact, rugged and has a high immunity to ambient light and RFI/EMI interference because of its internal shielding.

Applications include remote control with televisions, video games, garage door openers, electronic toys, and automobiles.

Maximum Ratings

Operating/Storage	
Temperature (T_{OP} , T_{STG})	... -25° to +85°C
Soldering Temperature	
(≥2 mm from case) (T_S) t≤3 s	... 260°C
Supply Voltage (V_{CC})	... -0.3 to +7.0V
Output Voltage (V_O)	... -0.3 to +7.0V
Output Current (I_O)	... 3 mA

Package Dimensions in Inches (mm)



Characteristics ($T_A=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Operating Voltage Range	V_{CC}	4.5 to 5.5	V
Operating Temperature Range	T_A	0 to 70°	°C
Switching Threshold			
(950 nm, $f=30$ kHz)	$E_{ES}^{(1)}$	40	nW/cm ²
Wavelength, Maximum Sensitivity	λ_{Smax}	950	nm
Spectral Sensitivity Range	$\Delta\lambda$	±160	nm
($S=10\%$ of S_{MAX})			
Half Angle	ϕ	±50	Deg
Current Consumption	I_{CC}	0.65	mA
Output Voltage ($I_O=100$ μ A)	V_{Olow}	<0.4	V
Output (output high, $V_O=5$ V)	I_O	<10	μ A
Turn-on Time ⁽²⁾			
($E_E=250$ nW/cm, $f=30$ kHz)	t_{ON}	100	μ s
Turn-off Time ⁽²⁾			
($E_E=250$ nW/cm, $f=30$ kHz)	t_{OFF}	200	μ s
Conducting Time			
($E_E=200$ μ W/cm, $f=30$ kHz)	t_{LOW}	700	μ s
($E_E=250$ μ W/cm, $f=30$ kHz)	t_{LOW}	500	μ s

Notes 1. A 30 m transmission distance is possible when used with IR emitter SFH415 at $I_F=1$ A ($I_E=400$ mW/sr)
 2. See Figure 2

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Figure 1. External Circuit

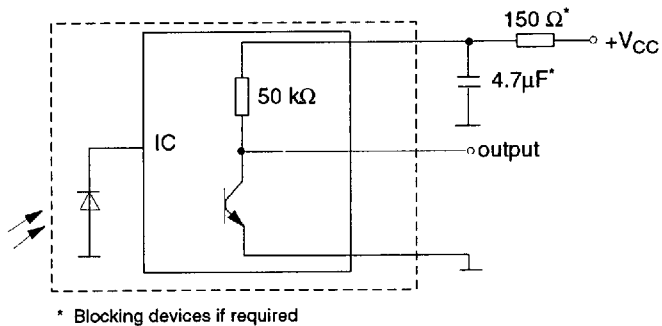
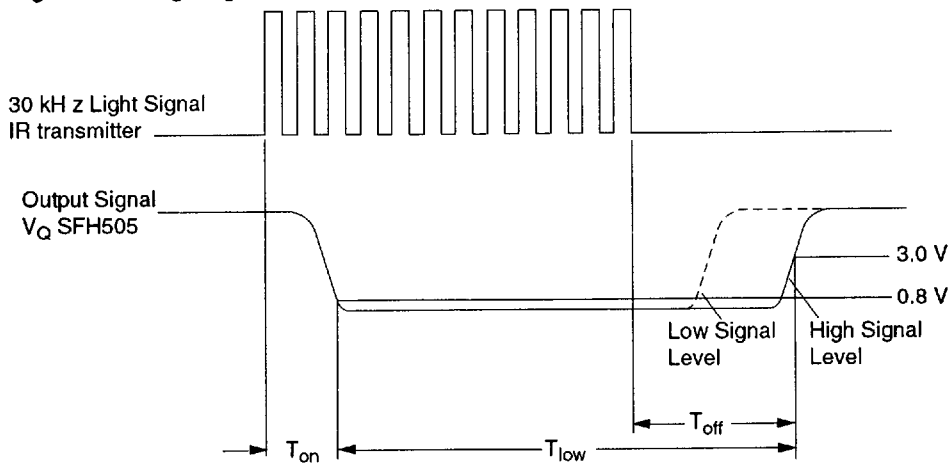


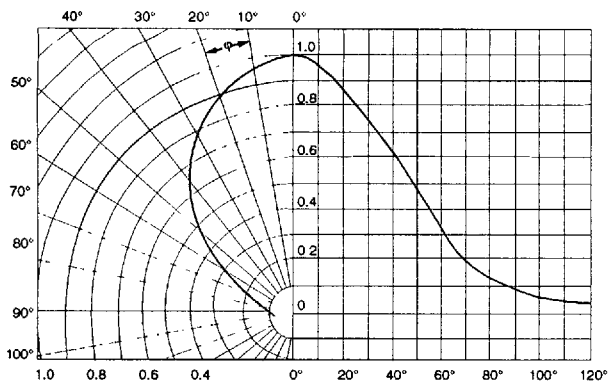
Figure 2. Timing Diagram



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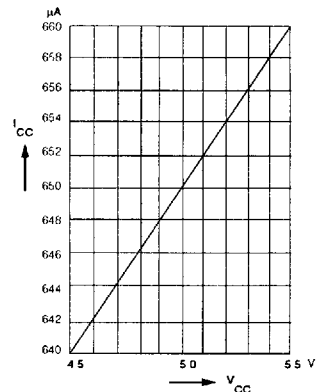
Directional characteristics

$$S_{REL} = f(\rho)$$



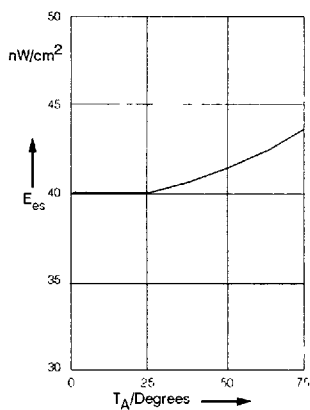
Current consumption

$$I_{CC1} = f(V_{CC})$$

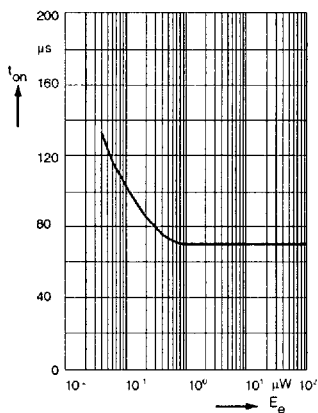


Switching threshold

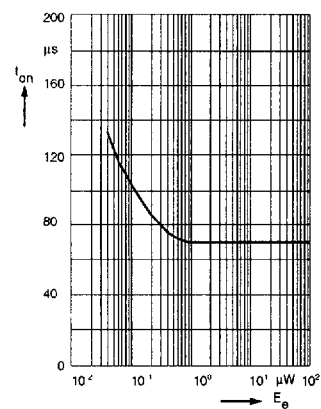
$$E_{ES} = f(T_A)$$


Turn-on time $t_{ON} = f(E_e)$

$$f = 30 \text{ kHz, 12 pulses}$$

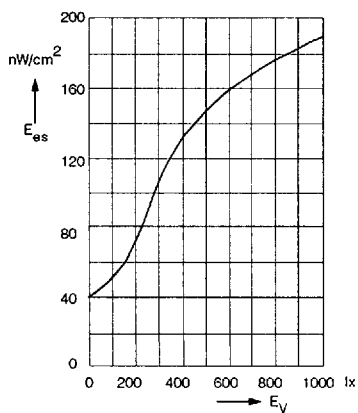

Turn-off time $t_{OFF} = f(E_e)$

$$f = 30 \text{ kHz, 12 pulses}$$



Extraneous light effect to switching threshold

$$E_{ES} = f(E_v)$$



Relative spectral sensitivity

$$i = f(\lambda)$$

