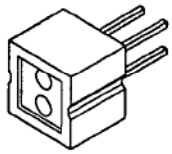
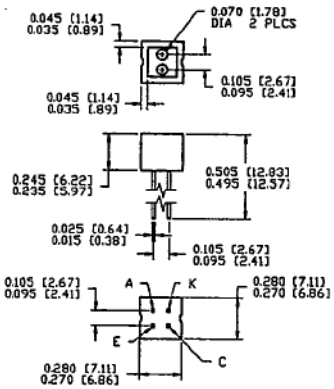
T-41-73

R-240 Series

Miniature Reflective Optical Switches





DIMENSIONS ARE IN INCHES (MILLIMETERS)

WHITE MARK ADJACENT TO COLLECTOR LEAD

Features

- small, compact construction
- pc board mount
- sensor is IR-bandpass filtered
- extremely low crosstalk
- wide field-of-view

Description

The R-240 series consists of a gallium arsenide IRED and silicon phototransistor mounted in an injection-molded plastic housing. Plano, epoxy lenses provide near-Lambertian optical characteristics and a mechanical stop eliminates light current fall-off as distance to the reflective object approaches zero. An integral optical filter reduces sensor sensitivity at wavelengths shorter than 700 nm. Device volume is 0.016 cubic inches (0.26 cm^3). For additional information, call Senisys for applications assistance.

Absolute Maximum Ratings ($T_A = 25°C$ unless otherwise stated.)

Storage and Operating Temperature ..... -40°C to +85°C
Lead Soldering Temperature[1] ..... 240°C[2]

IRED

Continuous Forward Current 50mA
Peak Forward Current (1μs pulse width, 300pps) 3A
Reverse Voltage 3V
Power Dissipation ..... 100mW[3]

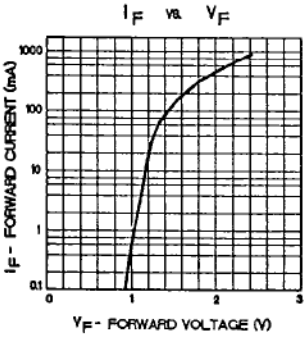
Sensor

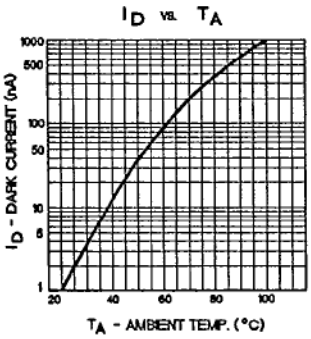
Collector-Emitter Voltage 30V
Emitter-Collector Voltage 5V
Power Dissipation ..... 100mW[3]

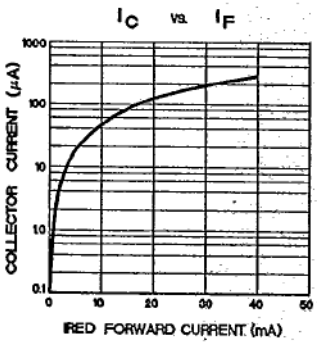
Notes:

1. 0.06" (1.5mm) from the case for 5 seconds maximum.
2. 260°C maximum when wave soldering.
3. Derate linearly from 25°C at -1.33 mW/°C.

Fundamental Characteristics







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R-240 Series

Miniature Reflective Optical Switches

Electrical Characteristics ($T_A = 25°C$ unless otherwise stated)

Symbol	Parameter		min	max	units	Test Conditions
Input Diode						
V_F	Forward Voltage		-	1.60	V	$I_F = 20mA$
I_R	Reverse Current		-	10	μA	$V_R = 3.0V$
Output Phototransistor[1]						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		30	-	V	$I_C = 1.0mA$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0	-	V	$I_E = 100\mu A$
I_D	Dark Current		-	200	nA	$V_{CE} = 20V$, $E_e = 0$
Coupled						
I_L	Light Current					
		R-240-A [2] [3]	500	-	μA	$I_F = 20mA$, $V_{CE} = 5V$, $d = 0.050"$
		R-240-B [2] [3]	350	-	μA	$I_F = 20mA$, $V_{CE} = 5V$, $d = 0.050"$
I_{CX}	Crosstalk [4]					
		R-240-A	-	200	nA	$I_F = 20mA$, $V_{CE} = 5V$, $d = \infty$
		R-240-B	-	200	nA	$I_F = 20mA$, $V_{CE} = 5V$, $d = \infty$

Notes:

1. Radiation outside the sensitivity range of the device may be present during these measurements. Sufficient protection has been provided when the parameter being measured cannot be altered by further irradiation shielding.
2. Other ranges of light current can be specified; call Senisys for applications assistance.
3. 'd' is the distance to a Kodak neutral test card (90% diffuse reflectance); for all testing, d = 0.050" (1.27mm).
4. Crosstalk is the measure of radiation transferred through the housing material. d = ∞ implies no reflective surface and the absence of spurious external radiation paths.

Typical Characteristics