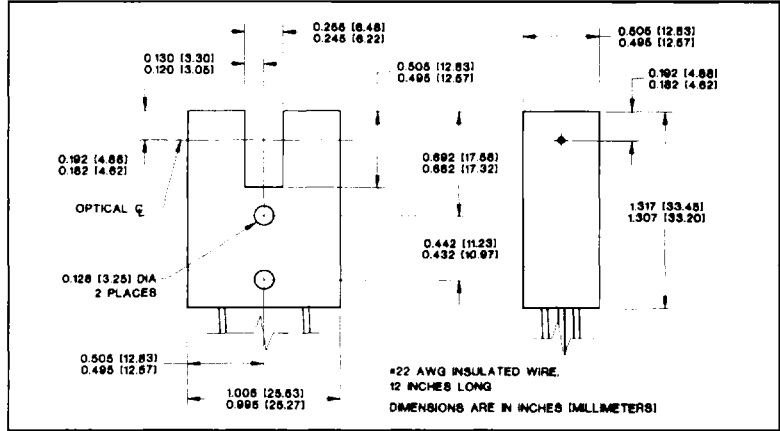
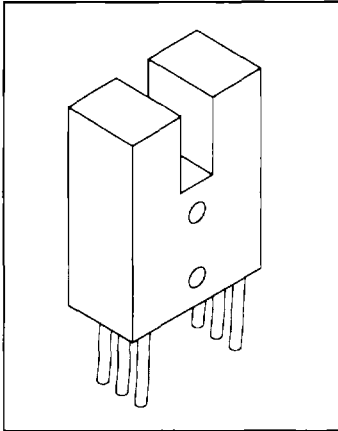


S-305, 325, 355, and 375

Slotted Optical Switches



Features

- hermetically sealed components
- wide sensing gap
- versatile mounting
- high resolution (S-305)
- 12" (305mm) wire leads

Description

The S-305-375 series are extremely rugged optical switches featuring hermetically sealed optoelectronic discretes in an injection-molded plastic⁽¹⁾ housing. The S-305 features a 0.005" (0.13mm) sensor aperture and an independent npn output transistor for high-gain and fast response. The S-325 and 355 have photodarlington outputs and the S-375 has a phototransistor output. These devices withstand a wide range of chemical and thermal environments.

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

Storage Temperature	-55°C to +150°C
Operating Temperature	-55°C to +125°C
Lead Soldering Temperature	260°C ⁽²⁾

IRED

Continuous Forward Current	100mA
Peak Forward Current (1µs pulse width, 300pps)	3A
Reverse Voltage	3V
Power Dissipation	200mW ⁽³⁾

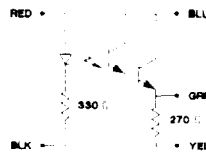
Sensor

Collector-Emitter Voltage	30V
Emitter-Collector Voltage	5V
Power Dissipation	200mW ⁽³⁾

Notes:

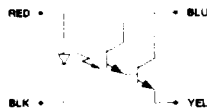
1. Molded from black polycarbonate.
2. Temperature-regulated soldering iron recommended.
3. Derate linearly from 25°C at -1.50 mW/°C.

The S-305 is the high-resolution member of this series, featuring a 0.005" (0.13mm) line aperture over the sensor. The independent darlington amplifier provides TTL-compatible currents while maintaining phototransistor switching speeds.



The S-355 is a complete, voltage-driven optical switch, featuring a 330 ohm internal series limiting resistor in the IRED circuit and a 270 ohm emitter load on the sensor side. Output currents are compatible with all TTL requirements.

The S-325 provides a monolithic photodarlington sensor for high current-transfer-ratio. No internal resistors are included in this unit to allow the designer complete flexibility in the use of this high-output optical switch.



The S-375 has a phototransistor output featuring nominal output currents along with typical phototransistor switching characteristics. The absence of internal resistors in this unit allows the designer the same flexibility found in the S-325.

S-305, 325, 355, and 375

Slotted Optical Switches



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

Symbol	Parameter	min	max	units	Test Conditions
Input Diode (all devices)					
V _F	Forward Voltage	-	1.60	V	I _F = 20mA
I _R	Reverse Current	-	10	μA	V _R = 3.0V
Output Sensor⁽¹⁾(all devices except as noted)					
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 = 100μA
I _D	Dark Current				
	S-305, 325, and 355	-	100	nA	V _{CE} = 10V
	S-375	-	50	nA	V _{CE} = 10V
Coupled					
I _L	Light Current ⁽²⁾				
	S-305	2.0	-	mA	I _F = 20mA, V _{CE} = 0.5V, V _{CC} = 5V
	S-325	3.0	-	mA	I _F = 10mA, V _{CE} = 5V
	S-375	1.0	-	mA	I _F = 20mA, V _{CE} = 5V
V _O ⁽³⁾	On-state Output Voltage - S-355	3.2	-	V	I _F = 10mA, V _{CC} = 5V
	Off-state Output Voltage - S-355	-	0.4	V	I _F = 0mA, V _{CC} = 5V
V _{CE(sat)}	Collector-Emitter Saturation Voltage				
	S-325, S-355 ⁽⁴⁾	-	1.0	V	I _F = 10mA, I _C = 4.0mA
	S-375	-	0.5	V	I _F = 20mA, I _C = 1.0mA

Typical Characteristics

Design Characteristics at T_A = 25°C (not guaranteed by test)

Symbol	Parameter	value	units	Conditions
t _r , t _f	Risetime, Falltime			
	S-325	50	μs	I _C = 2mA, V _{CC} = 10V, R _L = 100Ω
	S-355 ⁽⁵⁾	300	μs	I _C = 2mA, V _{CC} = 10V, R _L = 100Ω
	S-375	5	μs	I _C = 2mA, V _{CC} = 10V, R _L = 100Ω
t _r	Risetime - S-305	5	μs	I _C = 2mA, V _{CC} = 10V, R _L = 2.2K
t _f	Falltime - S-305	50	μs	I _C = 2mA, V _{CC} = 10V, R _L = 2.2K

Notes:

- 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.
- Other ranges of light current can be specified; call OptoSwitch for applications assistance.
- V_O measured between green and yellow leads.
- V_{CE(sat)} is measured between the blue and green leads; yellow is open or shorted to green.
- Dynamic response is measured between blue and green leads; yellow is open or shorted to green.