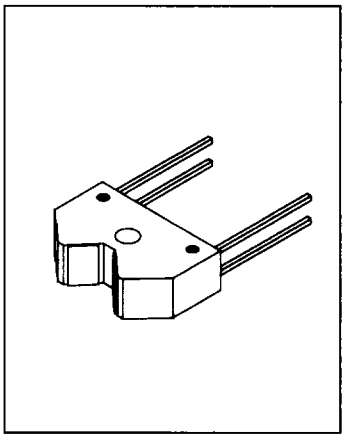
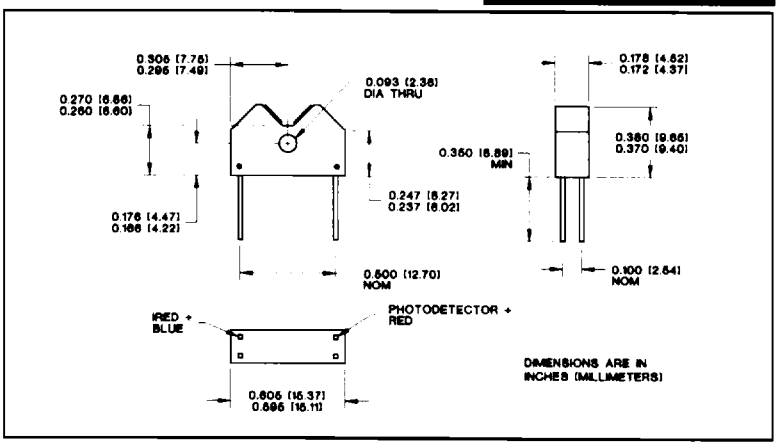
R-310 Series

Wafer Skanner® Reflective Optical Switch

CLAROSTAT
SENSORS AND CONTROLS GROUP





Features

- detects semiconductor wafers
- operating distance 0.050" (1.27mm)
- small physical size
- three body styles
- wavelength-filtered sensor

Description

The R-310 series consists of a gallium arsenide IRED and a silicon photosensor mounted in an injection-molded housing.The R-310, 312, and 314 feature phototransistors; the R-311, 313, and 315 have photodarlingtons. The unit directs energy from the IRED to the target; reflected energy is transmitted through an ambient light filter to the photosensor. Peak response is at 910 nm but is filtered -26 dB at 750 nm and -60 dB at 700 nm and below. See the part number guide on next page for ordering information.

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

Storage and Operating Temperature	-40°C to +50°C
Lead Soldering Temperature[1]	240°C[2]

IRED

Continuous Forward Current	40mA
Peak Forward Current (1µs pulse width, 300pps)	2A
Reverse Voltage	3V
Power Dissipation	70mW[3]

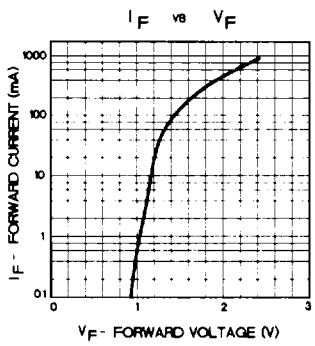
Sensor

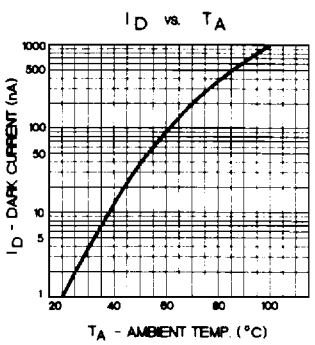
Collector-Emitter Voltage	30V
Emitter-Collector Voltage	5V
Power Dissipation	70mW[3]

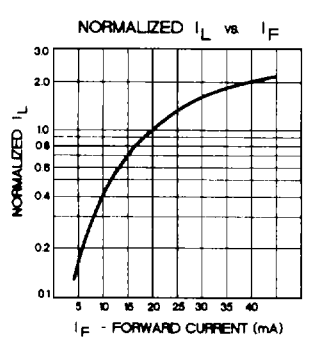
Notes:

1. 0.06" (1.5mm) from the case for 5 seconds maximum. (device leads)
2. 260°C maximum when wave soldering. (device leads)
3. Derate linearly from 25°C to T_A = 50°C at -1.70 mW/°C.

Fundamental Characteristics







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CLAROSTAT Sensors and Controls

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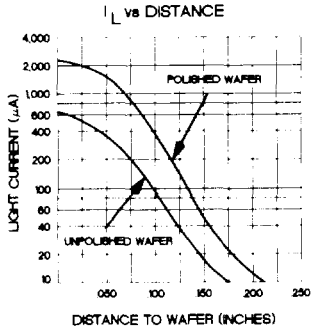
Electrical Characteristics (T_A = 25°C unless otherwise stated)

Symbol	Parameter	min	max	units	Test Conditions
Input Diode					
V_F	Forward Voltage	1.10	1.70	V	I_F = 60mA
I_R	Reverse Current	-	100	µA	V_R = 2.0V
Output Phototransistor(1)					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	V	I_C = 1mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0	-	V	I_E = 100µA
I_D	Dark Current	-	100	nA	V_{CE} = 10V, E_e = 0
Coupled					
I_L	Light Current (2) (3)				
	R-310, 312, and 314	0.25	-	mA	I_F = 40mA, V_{CE} = 5V, d = 0.050"
	R-311, 313, and 315	2.0	-	mA	I_F = 40mA, V_{CE} = 5V, d = 0.050"

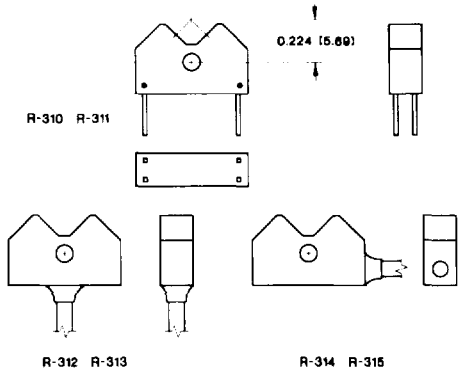
Notes:

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 Clarostat for applications assistance.
3. 'd' is the distance from the most forward point of the skanner to a Kodak 90% diffuse reflectance neutral test card; for all testing, d = 0.050" (1.27mm).

Typical Characteristics



Part Number Guide



R-310 R-311	FOUR TINNED LEADS FOR CIRCUIT BOARD MOUNTING
R-312 R-313 R-314 R-315	4 COND. 26 GA. TEFLON COVERED CABLE, WITH SHIELDED PHOTODETECTOR LEADS AND OVERALL SHIELD, 2 FT. LONG, TYPE J (SHIELDED QUAD)