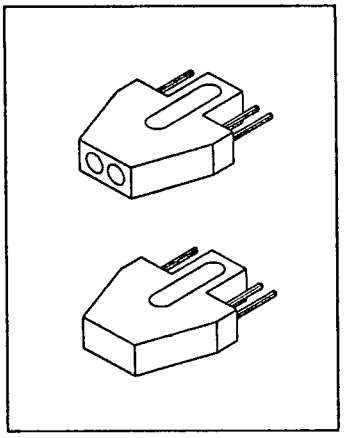
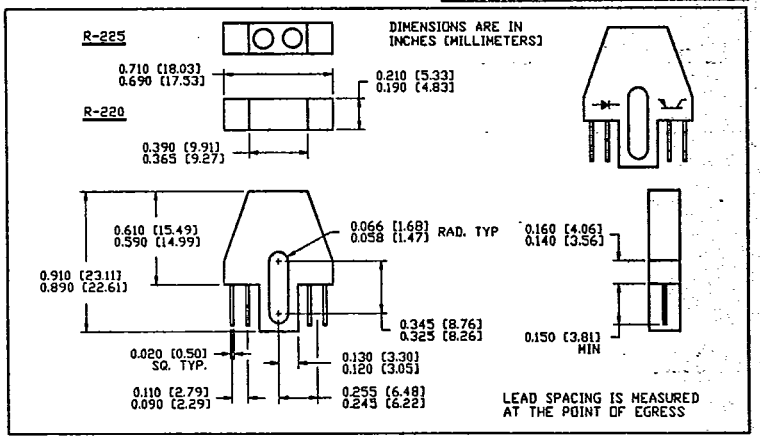
R-220/225 Series

Reflective Optical Switches

HAWKER SIDDELEY SENISYS SENSOR INTEGRATED SYSTEMS





Features

- pc board mount or wire leads[1]
- IR-transmissive housing[2] (R-220)
- IR-opaque housing[2] (R-225)
- two sensitivity ranges

Description

The R-220 and R-225 series consists of a gallium arsenide IRED and silicon phototransistor mounted in an injection-molded plastic housing. The mechanical axes of the sensor and IRED coincide 0.200" (5.1mm) in front of the device; peak current-transfer-ratio occurs at approximately 0.175" (4.4mm). The device is designed to provide usable photocurrents only when a reflective object is within the field of view. 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[3] ..... 240°C[4]

IRED

Continuous Forward Current 50mA
Peak Forward Current (1μs pulse width, 300pps) 3A
Reverse Voltage 3V
Power Dissipation ..... 100mW[5]

Sensor

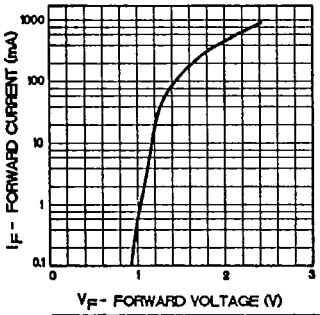
Collector-Emitter Voltage 30V
Emitter-Collector Voltage 5V
Power Dissipation ..... 100mW[5]

Notes:

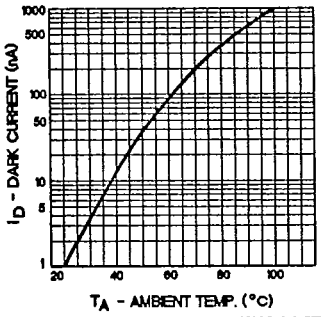
1. Add a -W suffix to order with 12" (305mm) minimum, 26 AWG, UL 1429 wire.
2. Housing is soluble in some common industrial solvents; recommended cleaning agents are isopropanol or methanol.
3. 0.06" (1.5mm) from the case for 5 seconds maximum. (pc board mount configuration)
4. 260°C maximum when wave soldering. (pc board mount configuration)
5. Derate linearly from 25°C at -1.33 mW/°C.

Fundamental Characteristics

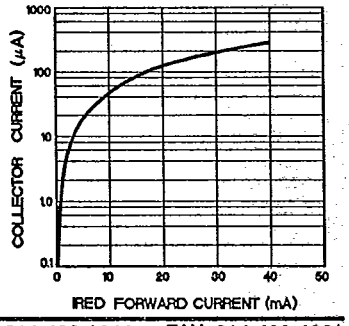
I_F vs. V_F



I_D vs. T_A



I_C vs. I_F



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T-41-73

R-220/225 Series

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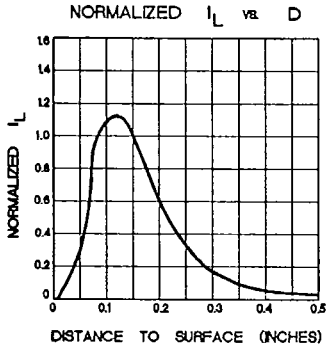
Electrical Characteristics ($T_A = 25°C$ unless otherwise stated)

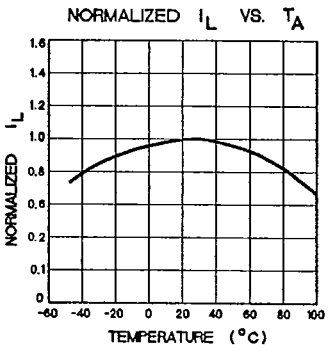
Symbol	Parameter		min	max	units	Test Conditions
Input Diode						
V_F	Forward Voltage		-	1.60	V	$I_F = 40mA$
I_R	Reverse Current		-	10	μA	$V_R = 3.0V$
Output Phototransistor[1]						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		30	-	V	$I_C = 1.0mA$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0	-	V	$I_E = 100\mu A$
I_D	Dark Current		-	100	nA	$V_{CE} = 10V$, $E_e = 0$
Coupled						
I_L	Light Current					
		R-22X-A [2] [3]	200	-	μA	$I_F = 40mA$, $V_{CE} = 5V$, d = 0.150"
		R-22X-B [2] [3]	50	-	μA	$I_F = 40mA$, $V_{CE} = 5V$, d = 0.150"
I_{CX}	Crosstalk [4]					
		R-22X-A	-	20	μA	$I_F = 40mA$, $V_{CE} = 5V$, $d = \infty$
		R-22X-B	-	10	μA	$I_F = 40mA$, $V_{CE} = 5V$, $d = \infty$

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. Either R-220 or R-225; both devices are available in each sensitivity range. 'd' is the distance to a Kodak neutral test card (90% diffuse reflectance); for all testing, d = 0.150" (3.8mm).
4. Crosstalk is the measure of radiation transferred through the housing material. $d = \infty$ implies no reflective surface and the absence of spurious external radiation paths.

Typical Characteristics





Wire Color Code:

Collector .....White
Emitter .....Blue
Anode.....Orange
Cathode.....Green