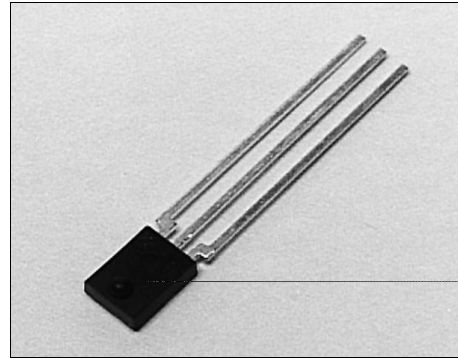


# SDP8604/8614

## Optoschmitt Detector 10 k Ohm Pull-Up Output

### FEATURES

- Side-looking plastic package
- 55° (nominal) acceptance angle
- TTL/LSTTL/CMOS compatible
- 10Ω pull-up output
- Buffer or inverting logic available
- High noise immunity output
- Mechanically and spectrally matched to SEP8506 and SEP8706 infrared emitting diodes



INFRA-8.TIF

### DESCRIPTION

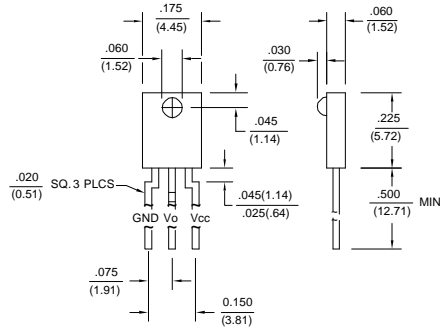
The SDP8604/8614 series consists of a high speed IC molded in a side-looking black plastic package to minimize the effect of visible ambient light. The detector incorporates a Schmitt trigger which provides pulse shaping and hysteresis for noise immunity. Detector output is an NPN silicon transistor with a 10 kΩ (nominal) pull-up resistor. This option eliminates the need for an external load resistor to generate an output signal voltage. Output rise and fall times are independent of rate of change of incident light. Detector sensitivity has been internally temperature compensated. For additional output configuration options refer to SDP8004/8014 and SDP8304/8314.

### Device Polarity:

- Buffer - Output is HI when incident light intensity is above the turn-on threshold level.
- Inverter - Output is LO when incident light intensity is above the turn-on threshold level.

### OUTLINE DIMENSIONS in inches (mm)

Tolerance	3 plc decimals	±0.005(0.12)
	2 plc decimals	±0.020(0.51)



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# SDP8604/8614

Optoschmitt Detector  
10 k Ohm Pull-Up Output

## ELECTRICAL CHARACTERISTICS (-40°C to +85°C unless otherwise noted)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Operating Supply Voltage	V <sub>CC</sub>	4.5		12.0	V	T <sub>A</sub> =25°C
Turn-on Threshold Irradiance <sup>(2)</sup> SDP8604-301, SDP8614-301	E <sub>ET(+)</sub>	0.06		0.37	mW/cm <sup>2</sup>	V <sub>CC</sub> =5 V T <sub>A</sub> =25°C
Hysteresis <sup>(3)</sup>	HYST	33		67	%	
Supply Current	I <sub>CC</sub>			15.0	mA	V <sub>CC</sub> =12 V E <sub>e</sub> =0 Or 3.0 mW/cm <sup>2</sup>
High Level Output Voltage SDP8604 SDP8614	V <sub>OH</sub>	2.4 2.4			V	V <sub>CC</sub> =4.5 V, I <sub>OH</sub> =0 E <sub>e</sub> =3.0 mW/cm <sup>2</sup> E <sub>e</sub> =0
Low Level Output Voltage SDP8604 SDP8614	V <sub>OL</sub>			0.4 0.4	V	V <sub>CC</sub> =4.5 V, I <sub>OL</sub> =12.8 mA E <sub>e</sub> =0 E <sub>e</sub> =3.0 mW/cm <sup>2</sup>
Internal Pull-Up Resistor	R <sub>INT</sub>	5.0	10.0	20.0	kΩ	
Operate Point Temperature Coefficient			-0.76		%/°C	Emitter @ Constant Temperature
Output Rise Time, Output Fall Time	t <sub>r</sub> , t <sub>f</sub>		70		ns	V <sub>CC</sub> =5 V, T <sub>A</sub> =25°C E <sub>e</sub> =0 or 3.0 mW/cm <sup>2</sup> f=10.0 kHz, D.C.=50% R <sub>L</sub> =390 Ω
Propagation Delay, Low-High, High-Low	t <sub>PLH</sub> , t <sub>PHL</sub>		2.5	5.0	μs	V <sub>CC</sub> =5 V, T <sub>A</sub> =25°C E <sub>e</sub> =0 or 3.0 mW/cm <sup>2</sup> f=10.0 kHz, D.C.=50% R <sub>L</sub> =390 Ω
Clock Frequency				100	kHz	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF

### Notes

- It is recommended that a bypass capacitor, 0.1 μF typical, be added between V<sub>CC</sub> and GND near the device in order to stabilize power supply line.
- The radiation source is an IRED with a peak wavelength of 935 nm.
- Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.

## ABSOLUTE MAXIMUM RATINGS

(25°C Free-Air Temperature unless otherwise noted)

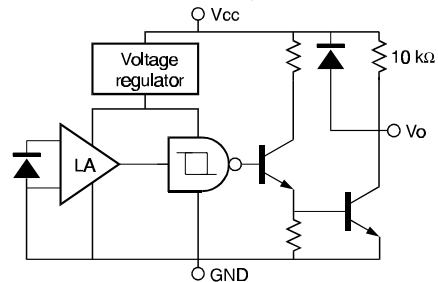
Supply Voltage	12 V <sup>(1)</sup>
Duration of Output Short to V <sub>CC</sub> or Ground	1.0 sec
Low Level Output Current	16.0 mA
Irradiance	25 mW/cm <sup>2</sup>
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-40°C to 85°C
Soldering Temperature (5 sec)	240°C

### Notes

- Derate linearly from 25°C to 5.5 V at 85°C.

## SCHEMATIC

SDP8604 BUFFER, 10 k Ω PULL-UP



Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

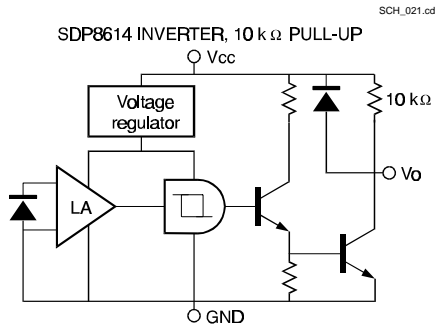
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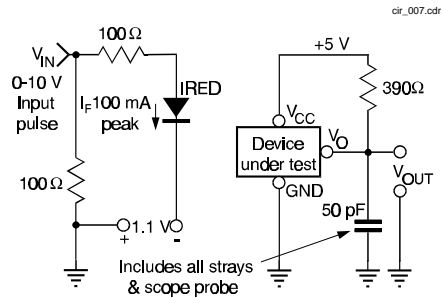
# SDP8604/8614

Optoschmitt Detector  
10 k Ohm Pull-Up Output

## SCHEMATIC



## SWITCHING TIME TEST CIRCUIT



## SWITCHING WAVEFORM FOR BUFFERS

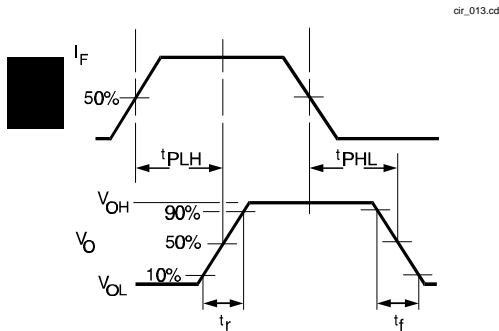
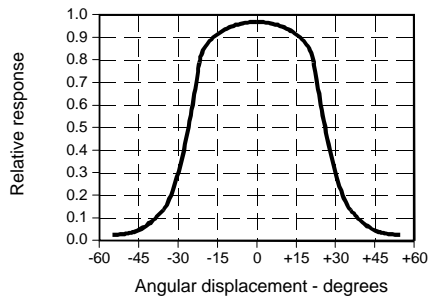


Fig. 1 Responsivity vs Angular Displacement



## SWITCHING WAVEFORM FOR INVERTERS

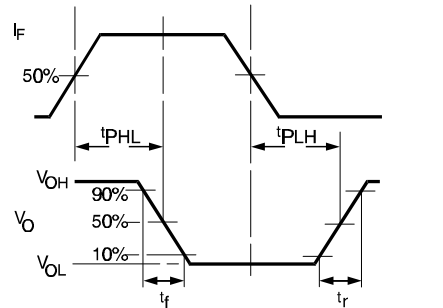
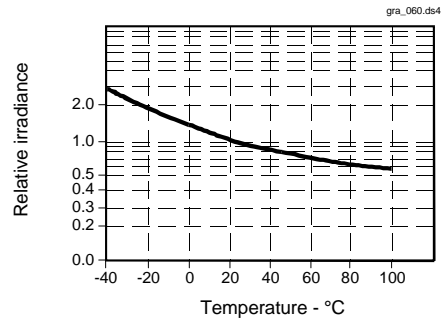


Fig. 2 Threshold Irradiance vs Temperature



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Optoschmitt Detector  
10 k Ohm Pull-Up Output

Fig. 3 Output Rise Time ( $t_r$ ) and Output Fall Time ( $t_f$ ) vs Temperature

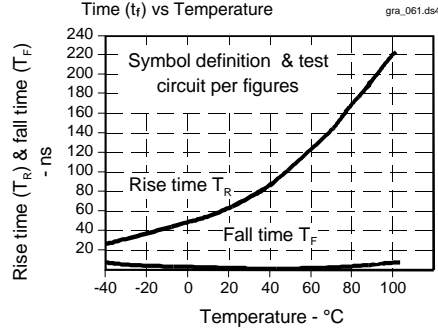


Fig. 4 Delay Time vs Temperature

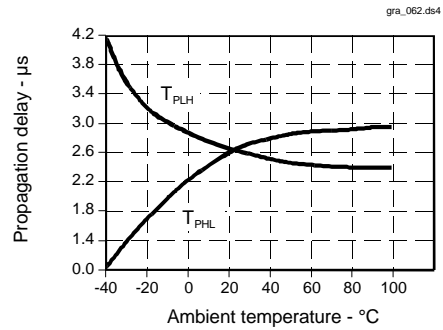
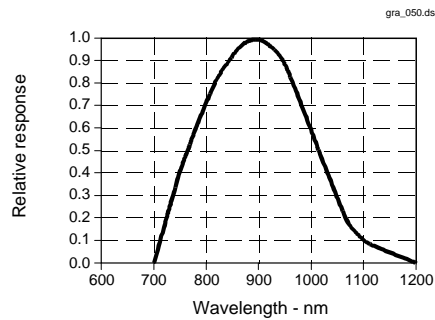


Fig. 5 Spectral Responsivity



All Performance Curves Show Typical Values

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