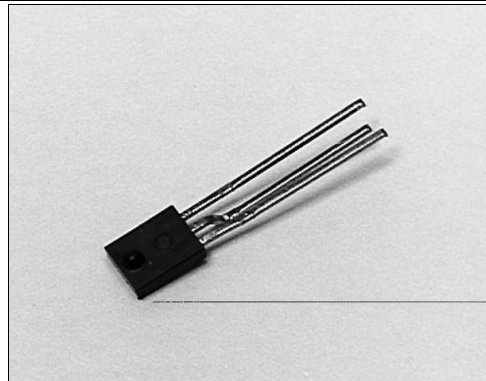


# SDP86XX

## Optoschmitt Detector

### FEATURES

- Side-looking plastic package
- 55° (nominal) acceptance angle
- Wide sensitivity ranges
- TTL/LSTTL/CMOS compatible
- Buffer (SDP8600/8601/8602) or inverting (SDP8610/8611/8612) logic available
- Three different lead spacing arrangements
- Mechanically and spectrally matched to SEP8506 and SEP8706 infrared emitting diodes



INFRA-6.TIF

### DESCRIPTION

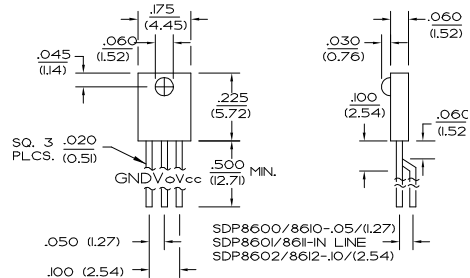
The SDP86XX series is a family of single chip Optoschmitt IC detectors molded in a side-looking black plastic package to minimize the effect of visible ambient light. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with a 10 kΩ (nominal) pull-up resistor. Output rise and fall times are independent of the rate of change of incident light. Detector sensitivity has been internally temperature compensated. Flexibility of use is enhanced by a choice of three different lead configurations; in-line (SDP8601/8611), 0.05 in. (1.27 mm) offset pin circle (SDP8600/8610) and 0.10 in. (2.54 mm) offset center lead (SDP8602/8612).

### 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)



DIM\_028.cdr

# SDP86XX

## Optoschmitt Detector

### 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	E <sub>ET(+)</sub>				mW/cm <sup>2</sup>	V <sub>CC</sub> =5 V T <sub>A</sub> =25°C (2)
SDP86XX-001			2.5			
SDP86XX-002			1.2			
SDP86XX-003			0.6			
Hysteresis (3)	HYST	5		30	%	
Supply Current	I <sub>CC</sub>			12.0 15.0	mA	E <sub>e</sub> =0 Or 3.0 mW/cm <sup>2</sup> V <sub>CC</sub> =5 V V <sub>CC</sub> =12 V
High Level Output Voltage	V <sub>OH</sub>				V	V <sub>CC</sub> =5 V, I <sub>OH</sub> =0 E <sub>e</sub> =3.0 mW/cm <sup>2</sup> E <sub>e</sub> =0
SDP8600/8601/8602		2.4				
SDP8610/8611/8612		2.4				
Low Level Output Voltage	V <sub>OL</sub>			0.4 0.4	V	V <sub>CC</sub> =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>
SDP8600/8601/8602				0.4		
SDP8610/8611/8612				0.4		
Internal Pull-Up Resistor	R <sub>INT</sub>	5.0	10.0	20.0	kΩ	
Operate Point Temperature Coefficient	OPTC		-0.76		%/°C	Emitter @ Constant Temperature
Output Rise Time	t <sub>r</sub>		60		ns	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF
Output Fall Time	t <sub>f</sub>		15		ns	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF
Propagation Delay, Low-High, High-Low	t <sub>PLH</sub> , t <sub>PHL</sub>		5.0		μs	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF
Clock Frequency				100	kHz	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF

#### Notes

1. 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.
2. The radiation source is an IRED with a peak wavelength of 935 nm.
3. Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.

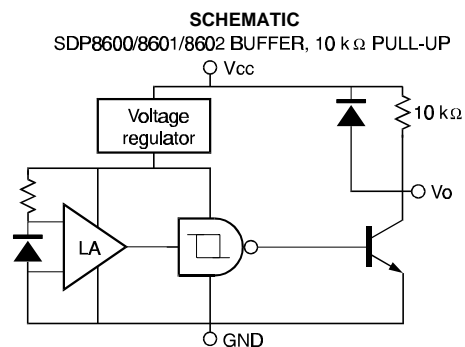
### ABSOLUTE MAXIMUM RATINGS

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

Supply Voltage	12 V (1)
Duration of Output	1.0 sec
Short to V <sub>CC</sub> or Ground	18 mA
Output Current	18 mA
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-40°C to 85°C
Soldering Temperature (5 sec)	240°C

#### Notes

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



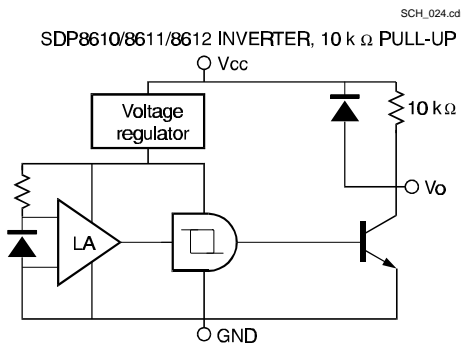
Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

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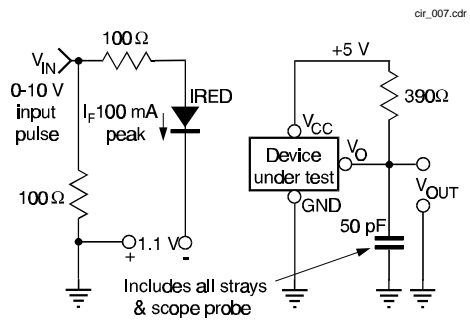
# SDP86XX

## Optoschmitt Detector

### SCHEMATIC



### SWITCHING TIME TEST CIRCUIT



### SWITCHING WAVEFORM FOR BUFFERS

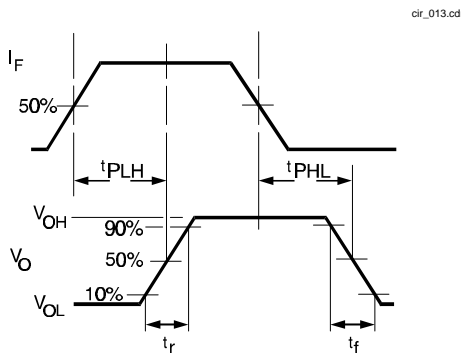
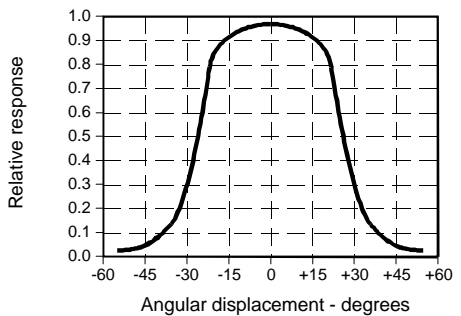


Fig. 1 Responsivity vs Angular Displacement



### SWITCHING WAVEFORM FOR INVERTERS

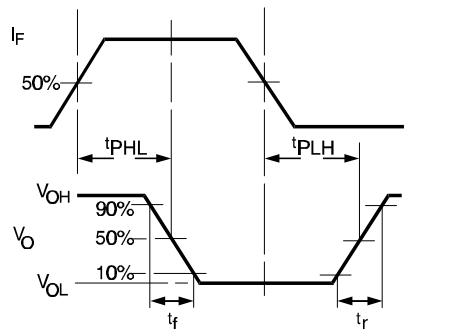
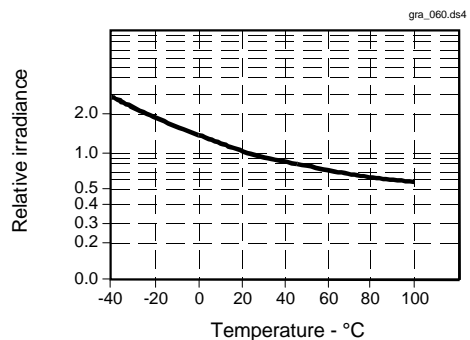


Fig. 2 Threshold Irradiance vs Temperature



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## Optoschmitt Detector

Fig. 3 Output Rise Time ( $t_r$ ) and Output Fall Time ( $t_f$ ) vs Temperature gra\_061.ds4

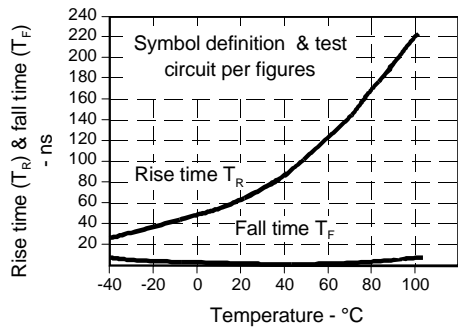


Fig. 4 Delay Time vs Temperature gra\_062.ds4

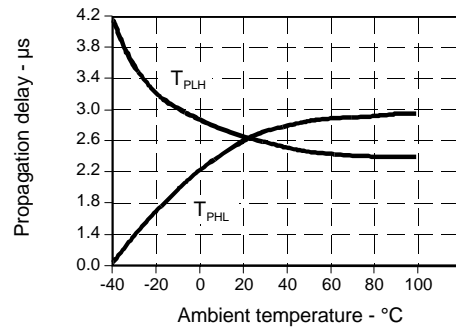
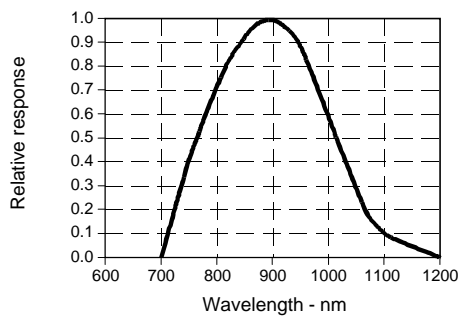


Fig. 5 Spectral Responsivity gra\_050.ds4



All Performance Curves Show Typical Values

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