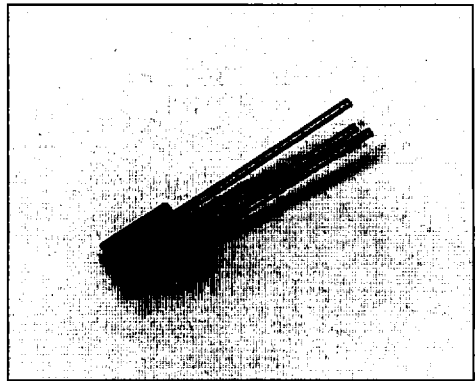


# SDP86XX

## 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 SEP8506/8526 and SEP8706 infrared emitting diodes



INFRA-6 TIF

### DESCRIPTION

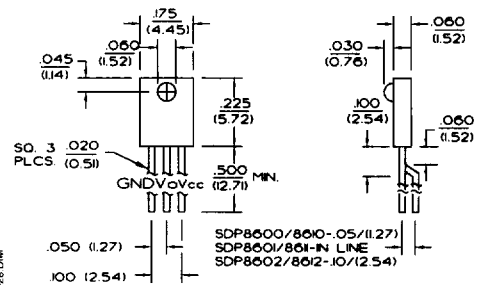
The SDP86XX series is a family of single chip Optoschmitt IC detectors molded in a side-looking black plastic package to minimize the effect of ambient light. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with a 10 kΩ (nominal) 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 LO when input excitation is zero.
- Inverter - Output is HI when input excitation is zero.

### OUTLINE DIMENSIONS in inches (mm)

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



INFRA-28 DIM



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# 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>σT(+)</sub>				mW/cm <sup>2</sup>	V <sub>CC</sub> =5 V T <sub>A</sub> =25°C
SDP86XX-001			2.5			(1)
SDP86XX-002			1.2			
SDP86XX-003			0.6			
Hysteresis <sup>(2)</sup>	HYST	5		30	%	
Supply Current	I <sub>CC</sub>				mA	E <sub>σ</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>			12.0 15.0	V	V <sub>CC</sub> =5 V, I <sub>OH</sub> =0 E <sub>σ</sub> =3.0 mW/cm <sup>2</sup>
SDP8600/8601/8602		2.4				E <sub>σ</sub> =0
SDP8610/8611/8612		2.4				
Low Level Output Voltage	V <sub>OL</sub>				V	V <sub>CC</sub> =5 V, I <sub>OL</sub> =12.8 mA E <sub>σ</sub> =0
SDP8600/8601/8602			0.4			E <sub>σ</sub> =3.0 mW/cm <sup>2</sup>
SDP8610/8611/8612			0.4			
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	t <sub>r</sub>		75		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

- 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.
- 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.

### ABSOLUTE MAXIMUM RATINGS

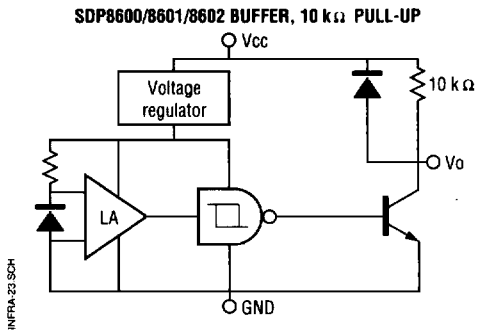
(25°C Free-Air Temperature unless otherwise noted)

Supply Voltage	12 V <sup>(1)</sup>
Duration of Output Short to V <sub>CC</sub> or Ground	1.0 sec.
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

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

### SCHEMATIC



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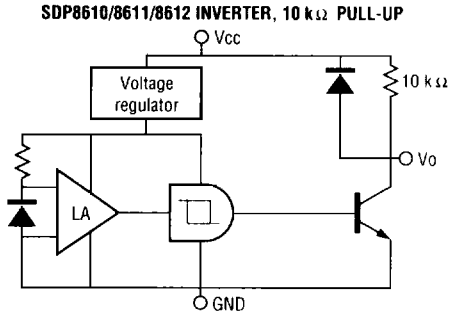
# Honeywell



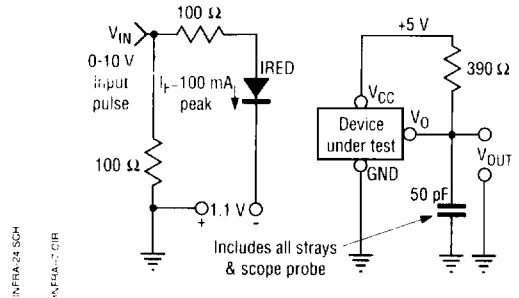
# SDP86XX

## Optoschmitt Detector

### SCHEMATIC



### SWITCHING TIME TEST CIRCUIT



### SWITCHING WAVEFORM FOR BUFFERS

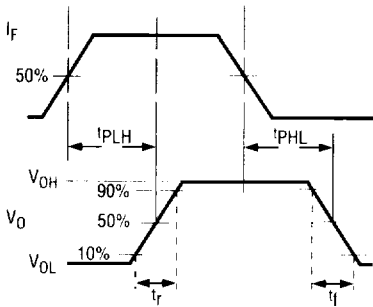
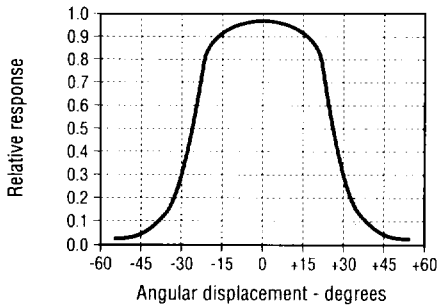


Fig. 1 Responsivity vs Angular Displacement



All Performance Curves Show Typical Values



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### SWITCHING WAVEFORM FOR INVERTERS

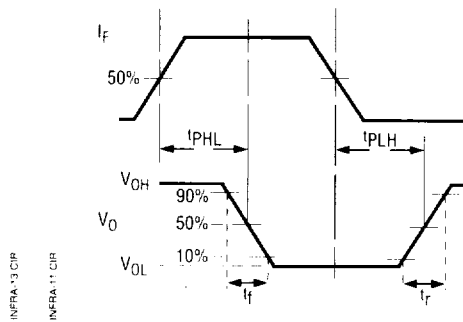
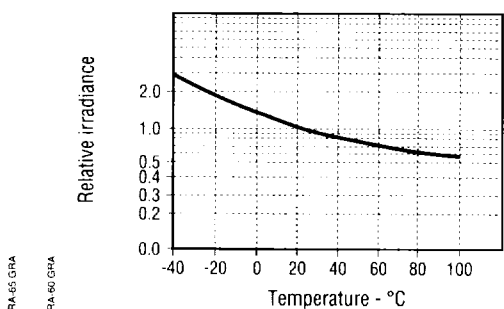


Fig. 2 Threshold Irradiance vs Temperature



# SDP86XX

## Optosmitt Detector

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

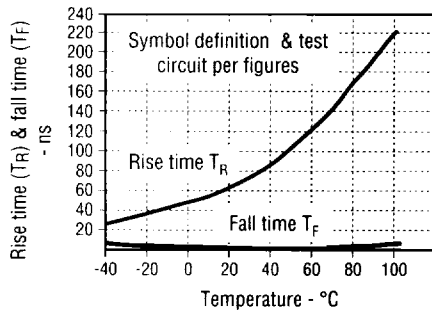


Fig. 4 Delay Time vs Temperature

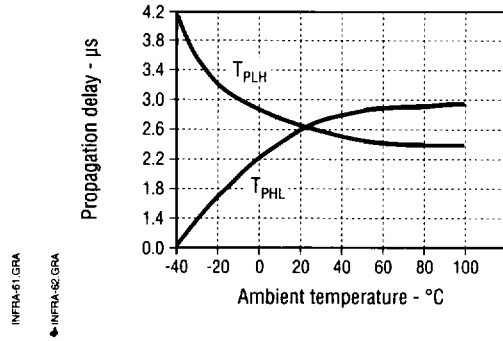
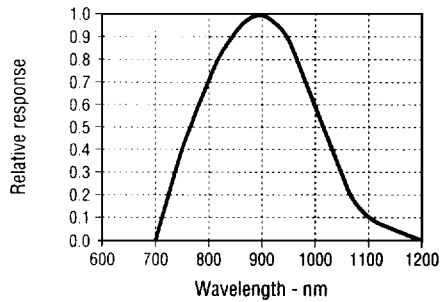


Fig. 5 Spectral Responsivity



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