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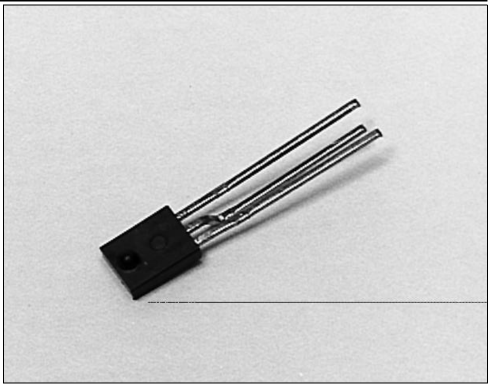
SDP86XX

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



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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).

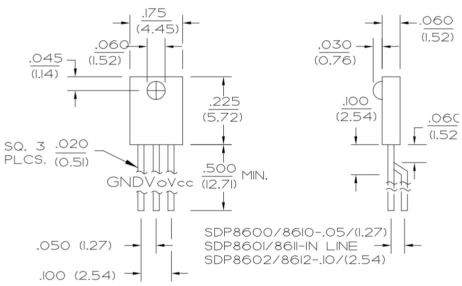
Device Polarity:

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)



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Honeywell

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_{CC}	4.5		12.0	V	T_A=25°C
Turn-on Threshold Irradiance	$E_{eT(+)}$				mW/cm²	V_{CC}=5 V
SDP86XX-001				2.5		T_A=25°C
SDP86XX-002				1.2		(2)
SDP86XX-003				0.6		
Hysteresis (3)	HYST	5		30	%	
Supply Current	I_{CC}				mA	E_e=0 Or 3.0 mW/cm²
				12.0		V_{CC}=5 V
				15.0		V_{CC}=12 V
High Level Output Voltage	V_{OH}				V	V_{CC}=5 V, I_{OH}=0
SDP8600/8601/8602		2.4				E_e=3.0 mW/cm²
SDP8610/8611/8612		2.4				E_e=0
Low Level Output Voltage	V_{OL}				V	V_{CC}=5 V, I_{OL}=12.8 mA
SDP8600/8601/8602				0.4		E_e=0
SDP8610/8611/8612				0.4		E_e=3.0 mW/cm²
Internal Pull-Up Resistor	R_{INT}	5.0	10.0	20.0	kΩ	
Operate Point Temperature Coefficient	O_{PTC}		-0.76		%/°C	Emitter @ Constant Temperature
Output Rise Time	t_r		60		ns	R_L=390 Ω, C_L=50 pF
Output Fall Time	t_f		15		ns	R_L=390 Ω, C_L=50 pF
Propagation Delay, Low-High, High-Low	t_{PLH}, t_{PHL}		5.0		µs	R_L=390 Ω, C_L=50 pF
Clock Frequency				100	kHz	R_L=390 Ω, C_L=50 pF

Notes
1. It is recommended that a bypass capacitor, 0.1 µF typical, be added between V_{CC} 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

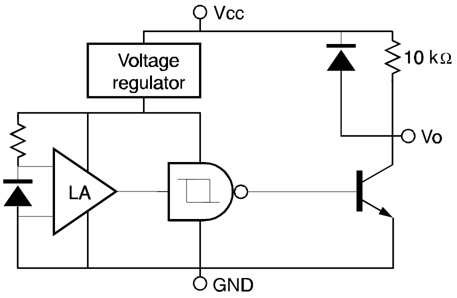
(25°C Free-Air Temperature unless otherwise noted)

Supply Voltage	12 V (1)
Duration of Output	
Short to V_{CC} 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
1. Derate linearly from 25°C to 5.5 V at 85°C.

SCHEMATIC

SDP8600/8601/8602 BUFFER, 10 kΩ PULL-UP



SDP86XX

Optoschmitt Detector

SCHEMATIC

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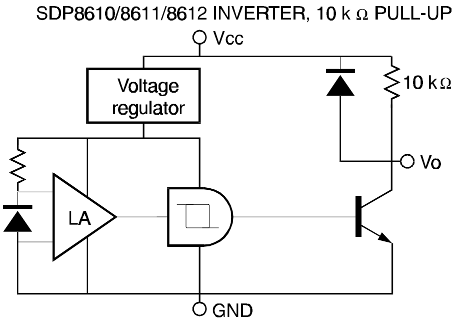
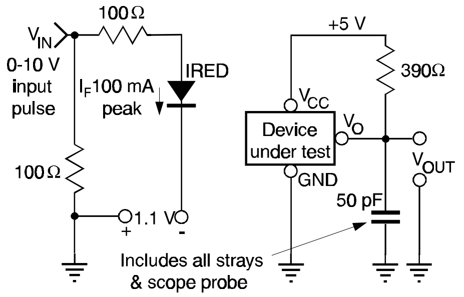


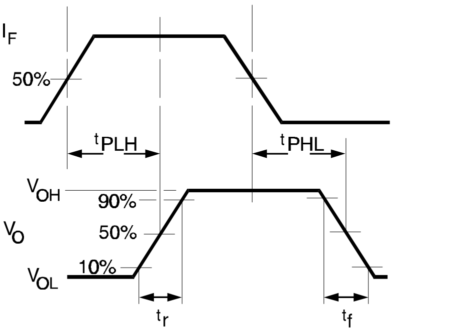
SWITCHING TIME TEST CIRCUIT

cir_007.cdr



SWITCHING WAVEFORM FOR BUFFERS

cir_013.cdr



SWITCHING WAVEFORM FOR INVERTERS

cir_011.cdr

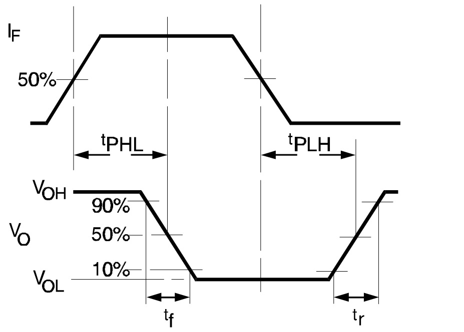


Fig. 1 Responsivity vs Angular Displacement

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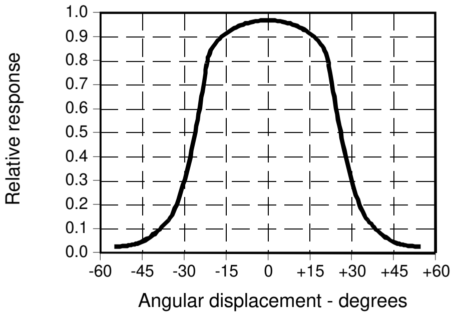
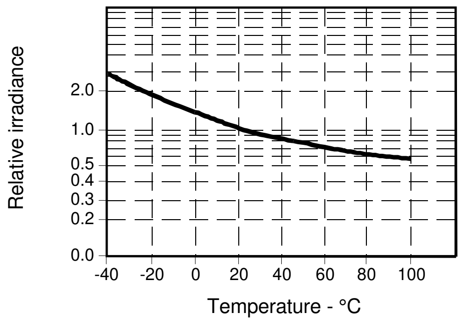


Fig. 2 Threshold Irradiance vs Temperature

gra_060.ds4



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SDP86XX

Optoschmitt Detector

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

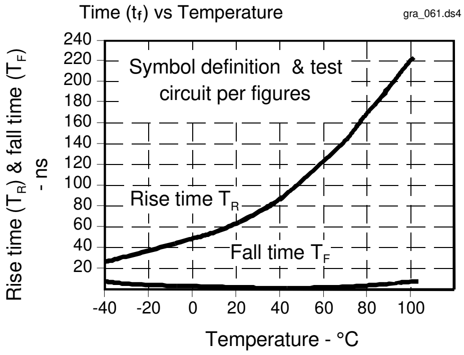


Fig. 4 Delay Time vs Temperature

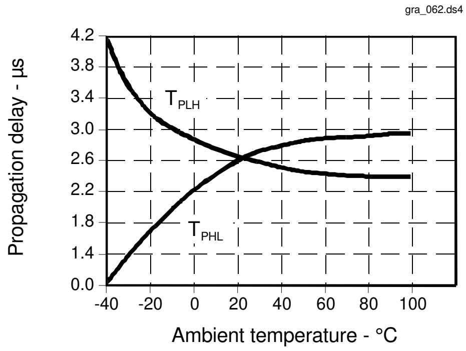
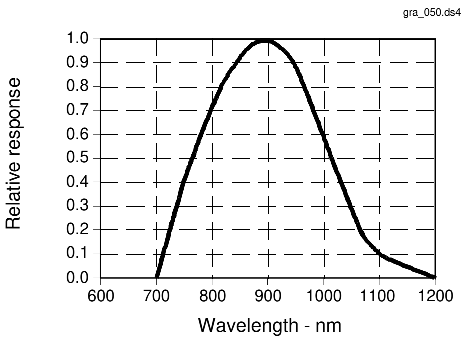


Fig. 5 Spectral Responsivity



All Performance Curves Show Typical Values