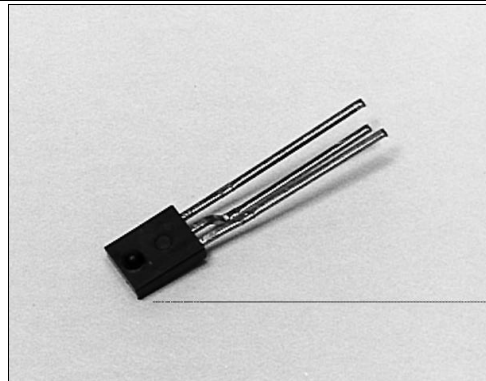


SDP86XX

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

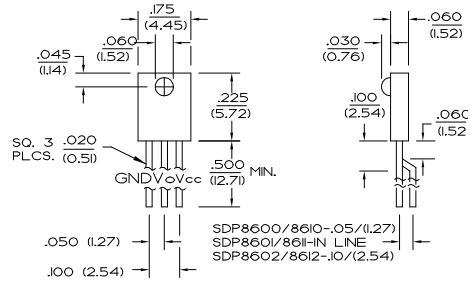
The SDP86XX series is a family of single chip Optoschmitt IC detectors molded in a side-looking black plastic package to minimize the effect of visible ambient light. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with a 10 kΩ (nominal) 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_{CC}	4.5	12.0		V	$T_A=25^\circ\text{C}$
Turn-on Threshold Irradiance	$E_{ET(+)}$				mW/cm^2	$V_{CC}=5\text{ V}$ $T_A=25^\circ\text{C}$ (2)
SDP86XX-001			2.5			
SDP86XX-002			1.2			
SDP86XX-003			0.6			
Hysteresis (3)	HYST	5		30	%	
Supply Current	I_{CC}			12.0 15.0	mA	$E_e=0$ Or $3.0\text{ mW}/\text{cm}^2$ $V_{CC}=5\text{ V}$ $V_{CC}=12\text{ V}$
High Level Output Voltage	V_{OH}				V	$V_{CC}=5\text{ V}$, $I_{OH}=0$ $E_e=3.0\text{ mW}/\text{cm}^2$ $E_e=0$
SDP8600/8601/8602		2.4				
SDP8610/8611/8612		2.4				
Low Level Output Voltage	V_{OL}			0.4 0.4	V	$V_{CC}=5\text{ V}$, $I_{OL}=12.8\text{ mA}$ $E_e=0$ $E_e=3.0\text{ mW}/\text{cm}^2$
SDP8600/8601/8602				0.4		
SDP8610/8611/8612				0.4		
Internal Pull-Up Resistor	R_{INT}	5.0	10.0	20.0	$\text{k}\Omega$	
Operate Point Temperature Coefficient	$OPTC$		-0.76		$\%/^\circ\text{C}$	Emitter @ Constant Temperature
Output Rise Time	t_r		60		ns	$R_L=390\ \Omega$, $C_L=50\ \text{pF}$
Output Fall Time	t_f		15		ns	$R_L=390\ \Omega$, $C_L=50\ \text{pF}$
Propagation Delay, Low-High, High-Low	t_{PLH} , t_{PHL}		5.0		μs	$R_L=390\ \Omega$, $C_L=50\ \text{pF}$
Clock Frequency				100	kHz	$R_L=390\ \Omega$, $C_L=50\ \text{pF}$

Notes

- 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.
- 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.

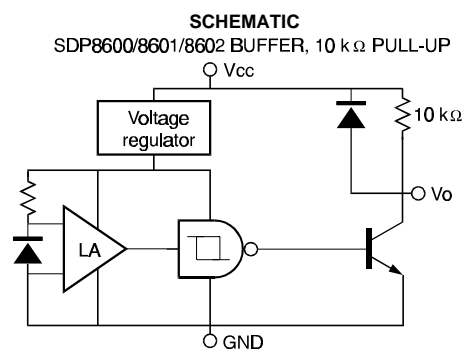
ABSOLUTE MAXIMUM RATINGS

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

Supply Voltage	12 V (1)
Duration of Output	1.0 sec
Short to V_{CC} 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

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



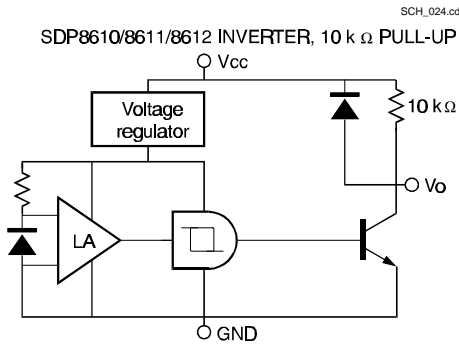
Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

Honeywell

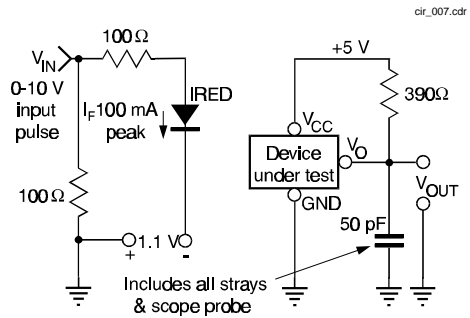
SDP86XX

Optoschmitt Detector

SCHEMATIC



SWITCHING TIME TEST CIRCUIT



SWITCHING WAVEFORM FOR BUFFERS

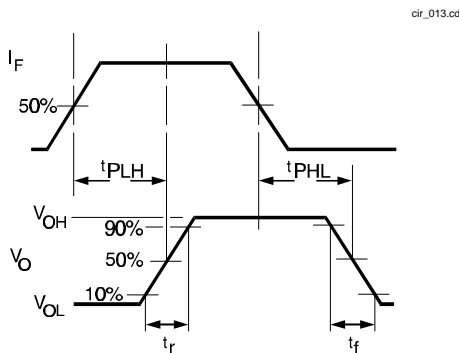
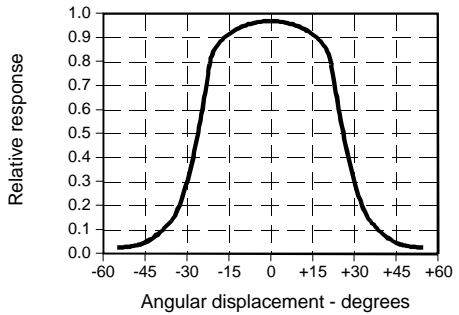


Fig. 1 Responsivity vs Angular Displacement



SWITCHING WAVEFORM FOR INVERTERS

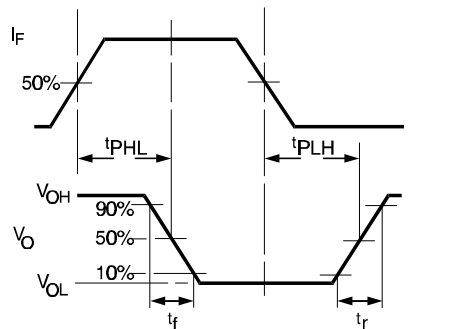
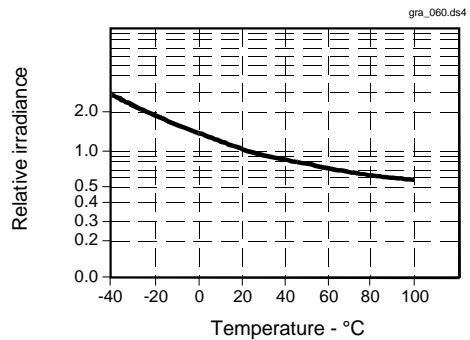


Fig. 2 Threshold Irradiance vs Temperature



SDP86XX

Optoschmitt Detector

Fig. 3 Output Rise Time (t_r) and Output Fall Time (t_f) vs Temperature gra_061.ds4

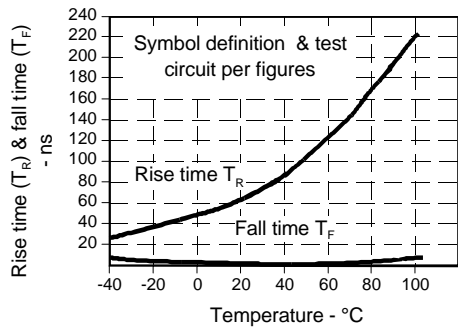


Fig. 4 Delay Time vs Temperature gra_062.ds4

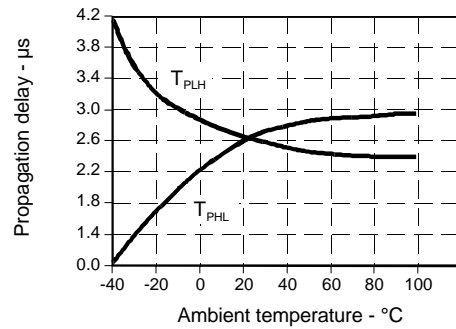
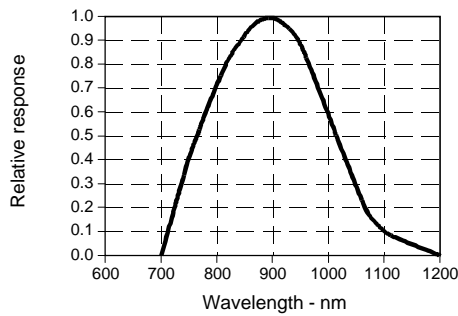


Fig. 5 Spectral Responsivity gra_050.ds4



All Performance Curves Show Typical Values