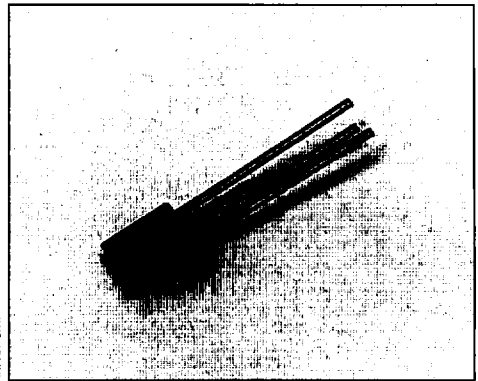


SDP86XX

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



DESCRIPTION

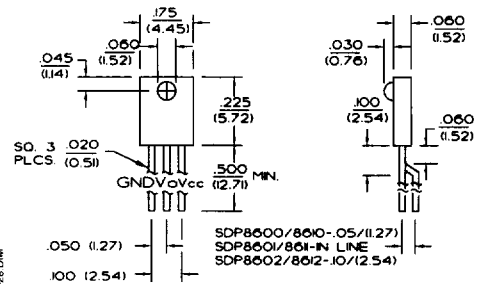
The SDP86XX series is a family of single chip Optoschmitt IC detectors molded in a side-looking black plastic package to minimize the effect of ambient light. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with a 10 k Ω (nominal)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



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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 _{CC}	4.5		12.0	V	T _A =25°C
Turn-on Threshold Irradiance	E _{OT} (+)				mW/cm ²	V _{CC} =5 V T _A =25°C (1)
SDP86XX-001				2.5		
SDP86XX-002				1.2		
SDP86XX-003				0.6		
Hysteresis ⁽²⁾	HYST	5		30	%	E _{OT} =0 or 3.0 mW/cm ²
Supply Current	I _{CC}			12.0 15.0	mA	V _{CC} =5 V V _{CC} =12 V
High Level Output Voltage	V _{OH}				V	V _{CC} =5 V, I _{OH} =0 E _{OT} =3.0 mW/cm ²
SDP8600/8601/8602		2.4				E _{OT} =0
SDP8610/8611/8612		2.4				
Low Level Output Voltage	V _{OL}				V	V _{CC} =5 V, I _{OL} =12.8 mA E _{OT} =0
SDP8600/8601/8602				0.4		E _{OT} =3.0 mW/cm ²
SDP8610/8611/8612				0.4		
Internal Pull-Up Resistor	R _{INT}	5.0	10.0	20.0	kΩ	
Operate Point Temperature Coefficient			-0.76		%/°C	Emitter @ Constant Temperature
Output Rise Time	t _r		75		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

- 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_{CC} and GND near the device in order to stabilize power supply line.

ABSOLUTE MAXIMUM RATINGS

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

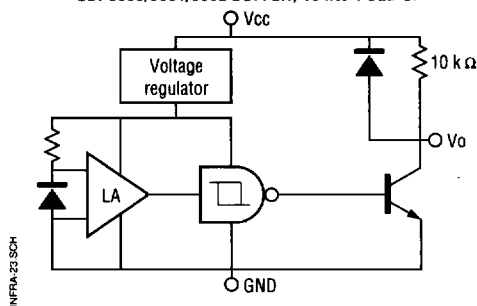
Supply Voltage	12 V ⁽¹⁾
Duration of Output Short to V _{CC} or Ground	1.0 sec.
Output Current	18 mA
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-40°C to 85°C
Soldering Temperature (5 sec)	240°C

Notes

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

SCHEMATIC

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



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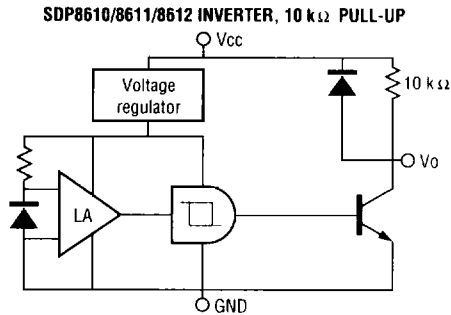
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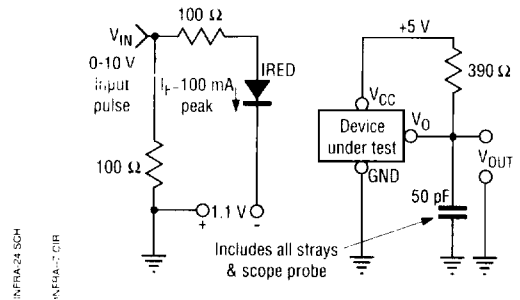
SDP86XX

Optoschmitt Detector

SCHEMATIC



SWITCHING TIME TEST CIRCUIT



SWITCHING WAVEFORM FOR BUFFERS

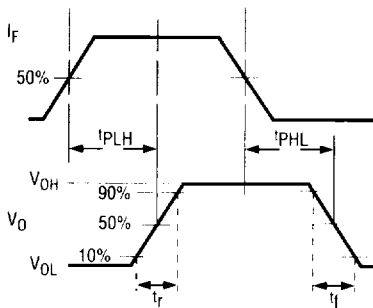
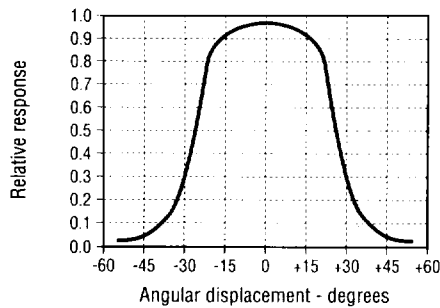


Fig. 1 Responsivity vs Angular Displacement



All Performance Curves Show Typical Values



SWITCHING WAVEFORM FOR INVERTERS

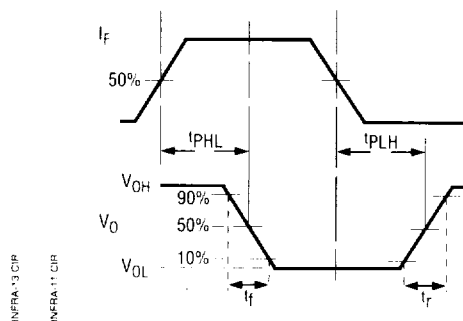
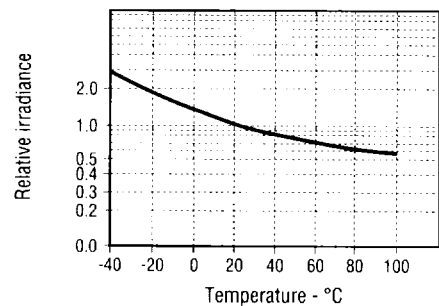


Fig. 2 Threshold Irradiance vs Temperature



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Optoschmitt Detector

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

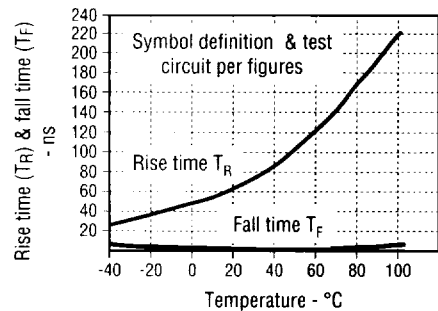


Fig. 4 Delay Time vs Temperature

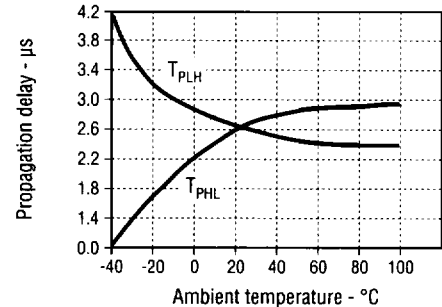
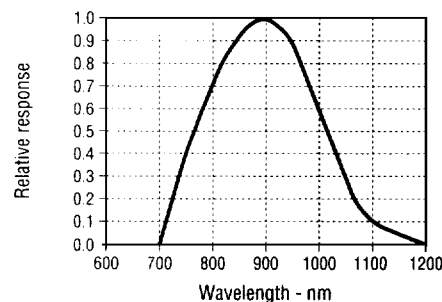


Fig. 5 Spectral Responsivity



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