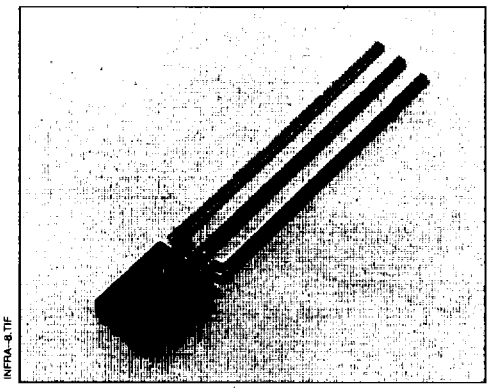
SDP8604/8614

Optoschmitt Detector
10 kΩ Pull-Up Output

FEATURES

- Side-looking plastic package
- 55° (nominal) acceptance angle
- TTL/LSTTL/CMOS compatible
- 10 kΩ pull-up output
- Buffer (SDP8604) or inverting (SDP8614) logic available
- High noise immunity output
- Mechanically and spectrally matched to SEP8506/8526 and SEP8706 infrared emitting diodes



INFRA-8.TIF

DESCRIPTION

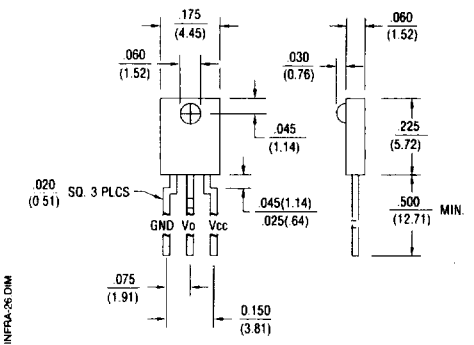
The SDP8604/8614 series consists of a high speed IC molded in a side-looking black plastic package to minimize the effect of ambient light. The detector incorporates a Schmitt trigger which provides pulse shaping and hysteresis for noise immunity. Detector output is an NPN silicon transistor with a 10 kΩ (nominal) pull-up resistor. This option eliminates the need for an external load resistor to generate an output signal voltage. Output rise and fall times are independent of rate of change of incident light. Detector sensitivity has been internally temperature compensated. For additional output configuration options refer to SDP8004/8014 and SDP8304/8314.

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-26.DIM

Honeywell

SDP8604/8614

Optoschmitt Detector
10 kΩ Pull-Up Output

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(1)	$E_{eT}(+)$				mW/cm²	V_{CC}=5 V
SDP8604-301, SDP8614-301		0.06		0.37		T_A=25°C
Hysteresis(2)	HYST	33		67	%	
Supply Current	I_{CC}			15.0	mA	V_{CC}=12 V
						E_e=0 or 3.0 mW/cm²
High Level Output Voltage	V_{OH}				V	V_{CC}=4.5 V, I_{OH}=0
SDP8604		2.4				E_e=3.0 mW/cm²
SDP8614		2.4				E_e=0
Low Level Output Voltage	V_{OL}				V	V_{CC}=5.5 V, I_{OL}=12.8 mA
SDP8604				0.4		E_e=0
SDP8614				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			-0.76		%/°C	Emitter @ Constant Temperature
Output Rise Time, Output Fall Time	t_r, t_f		70		ns	V_{CC}=5 V, T_A=25°C
						E_e=0 or 3.0 mW/cm²
						f=10.0 kHz, D.C.=50%
						R_L=390 Ω
Propagation Delay, Low-High, High-Low	t_{PLH}, t_{PHL}		5.0		µs	V_{CC}=5 V, T_A=25°C
						E_e=0 or 3.0 mW/cm²
						f=10.0 kHz, D.C.=50%
						R_L=390 Ω
Clock Frequency				100	kHz	R_L=390 Ω, C_L=50 pF

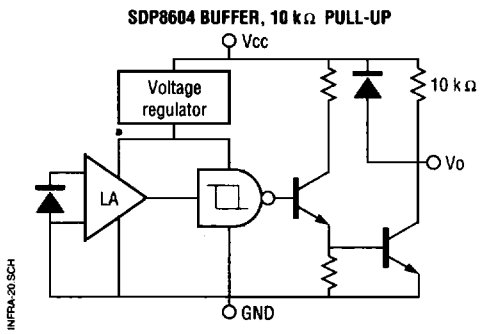
Notes
1. The radiation source is an IRED with a peak wavelength of 935 nm.
2. Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.
3. It is recommended that a bypass capacitor, 0.1 µf typical, be 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
Low Level Output Current	16 mA
Irradiance	25 mW/cm²
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



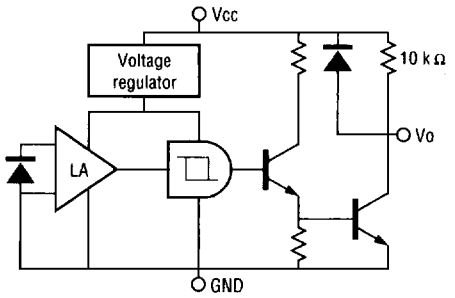
Honeywell

SDP8604/8614

Optoschmitt Detector
10 kΩ Pull-Up Output

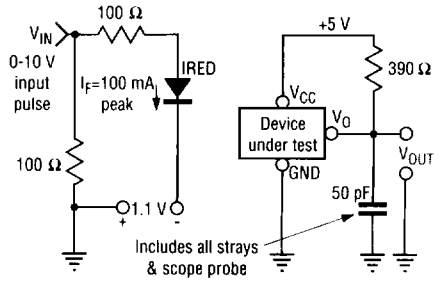
SCHEMATIC

SDP8614 INVERTER, 10 kΩ PULL-UP



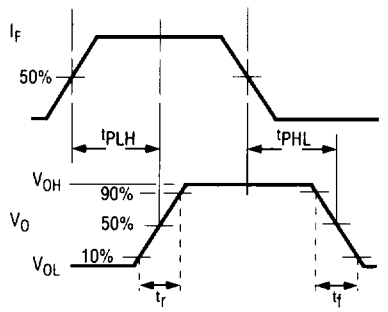
INFRA-21.SCH

SWITCHING TIME TEST CIRCUIT



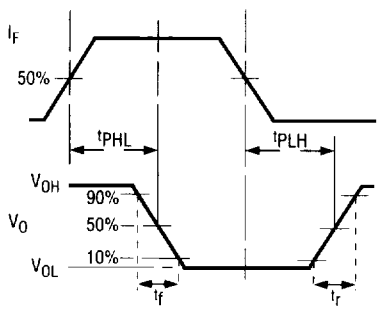
INFRA-7.CIR

SWITCHING WAVEFORM FOR BUFFERS



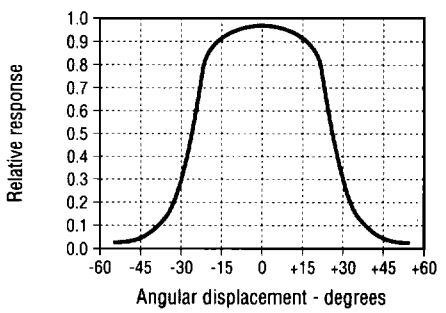
INFRA-13.CIR

SWITCHING WAVEFORM FOR INVERTERS



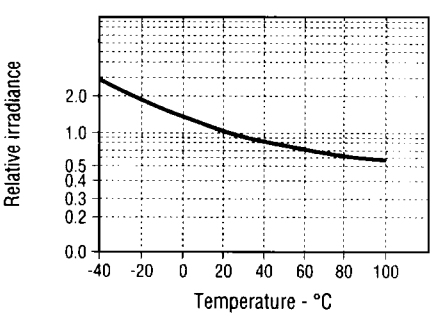
INFRA-11.CIR

Fig. 1 Responsivity vs Angular Displacement



INFRA-66.GRA

Fig. 2 Threshold Irradiance vs Temperature



INFRA-60.GRA

All Performance Curves Show Typical Values

Honeywell

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

SDP8604/8614

Optoschmitt Detector
10 kΩ Pull-Up Output

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

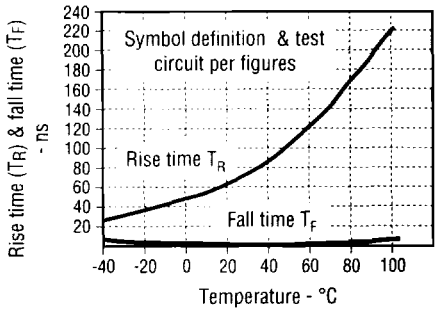


Fig. 4 Delay Time vs Temperature

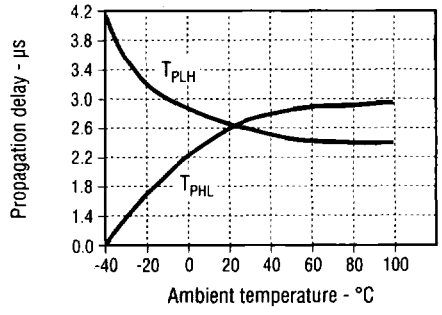
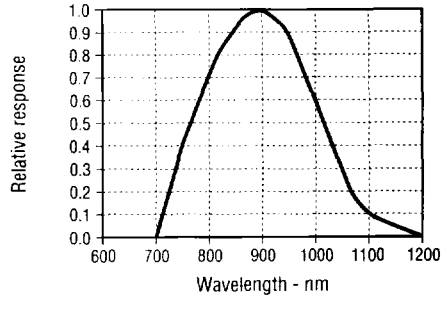


Fig. 5 Spectral Responsivity



Honeywell