

# SDP8304/8314

## Optoschmitt Detector Open-Collector Output

### 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 <sup>(2)</sup><br>SDP8304-301, SDP8314-301 | E <sub>ET(+)</sub>                  | 0.06 | 0.37       |     | mW/cm <sup>2</sup> | V <sub>CC</sub> =5 V<br>T <sub>A</sub> =25°C                                                                                               |
| Hysteresis <sup>(3)</sup>                                               | HYST                                | 33   | 67         |     | %                  |                                                                                                                                            |
| Supply Current                                                          | I <sub>CC</sub>                     |      | 15.0       |     | mA                 | V <sub>CC</sub> =12 V<br>E <sub>e</sub> =0 Or 3.0 mW/cm <sup>2</sup>                                                                       |
| Low Level Output Voltage<br>SDP8304<br>SDP8314                          | V <sub>OL</sub>                     |      | 0.4<br>0.4 |     | V                  | V <sub>CC</sub> =5 V, I <sub>OL</sub> =12.8 mA<br>E <sub>e</sub> =0<br>E <sub>e</sub> =3.0 mW/cm <sup>2</sup>                              |
| High Level Output Current<br>SDP8304<br>SDP8314                         | I <sub>OH</sub>                     |      | 100<br>100 |     | μA                 | V <sub>CC</sub> =4.5 V V <sub>OH</sub> =30 V<br>E <sub>e</sub> =3.0 mW/cm <sup>2</sup><br>E <sub>e</sub> =0                                |
| Operate Point Temperature Coefficient                                   |                                     |      | -0.76      |     | %/°C               | Emitter @ Constant Temperature                                                                                                             |
| Output Rise Time, Output Fall Time                                      | t <sub>r</sub> , t <sub>f</sub>     |      | 7.0        |     | ns                 | V <sub>CC</sub> =5 V, T <sub>A</sub> =25°C<br>E <sub>e</sub> =0 or 3.0 mW/cm <sup>2</sup><br>f=10.0 kHz, D.C.=50%<br>R <sub>L</sub> =390 Ω |
| Propagation Delay, Low-High, High-Low                                   | t <sub>PLH</sub> , t <sub>PHL</sub> |      | 2.5 5.0    |     | μs                 | V <sub>CC</sub> =5 V, T <sub>A</sub> =25°C<br>E <sub>e</sub> =0.5 mW/cm <sup>2</sup><br>f=10.0 kHz, D.C.=50%<br>R <sub>L</sub> =390 Ω      |
| Clock Frequency                                                         |                                     |      | 100        |     | kHz                | R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF                                                                                               |

#### Notes

1. 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.
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

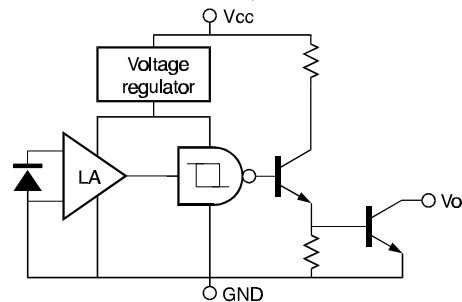
(25°C Free-Air Temperature unless otherwise noted)

|                                    |                       |
|------------------------------------|-----------------------|
| Supply Voltage                     | 12 V <sup>(1)</sup>   |
| Duration of Output                 | 1.0 sec               |
| Short to V <sub>CC</sub> or Ground | 1.0 sec               |
| Applied Output Voltage             | 35 V                  |
| Low Level Output Current           | 16 mA                 |
| Irradiance                         | 25 mW/cm <sup>2</sup> |
| 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 SDP8304 BUFFER, OPEN-COLLECTOR



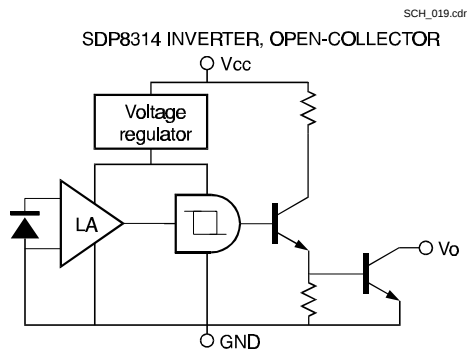
Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

# Honeywell

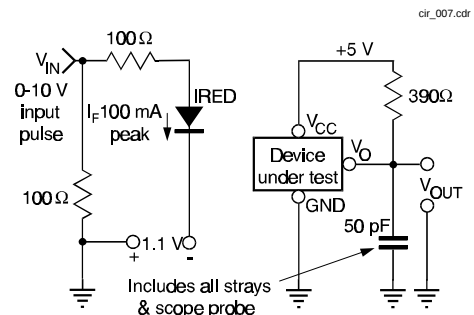
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## SCHEMATIC



## SWITCHING TIME TEST CIRCUIT



## SWITCHING WAVEFORM FOR BUFFERS

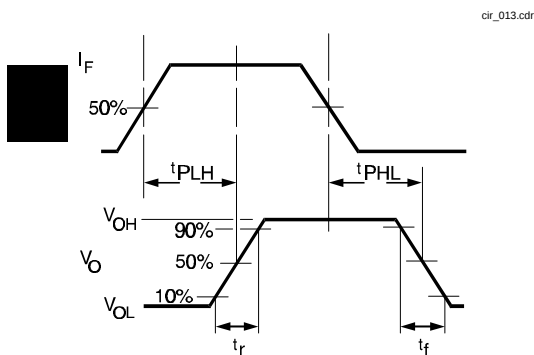
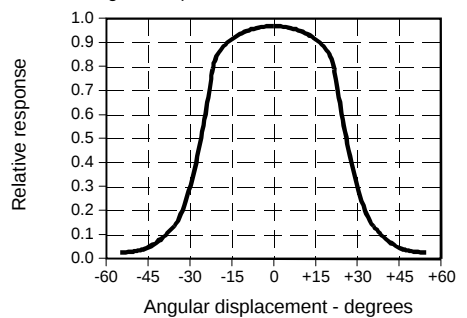


Fig. 1 Responsivity vs Angular Displacement



## SWITCHING WAVEFORM FOR INVERTERS

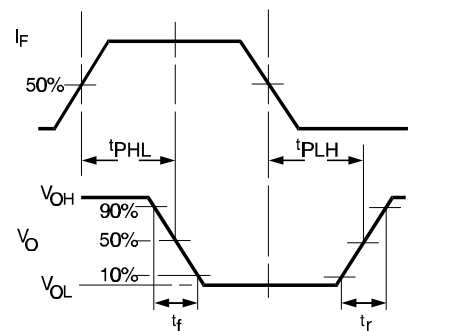
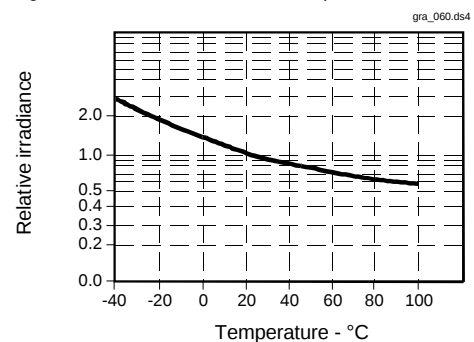


Fig. 2 Threshold Irradiance vs Temperature



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

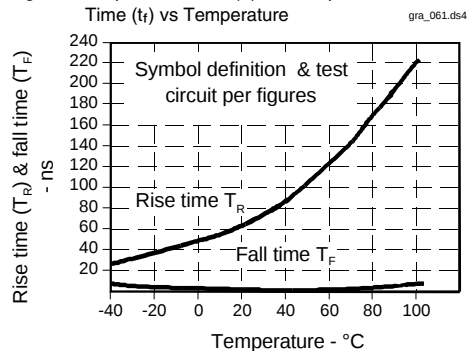


Fig. 4 Delay Time vs Temperature

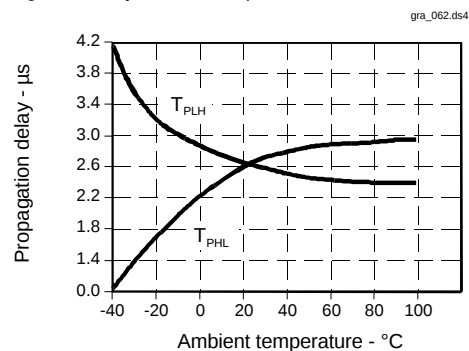
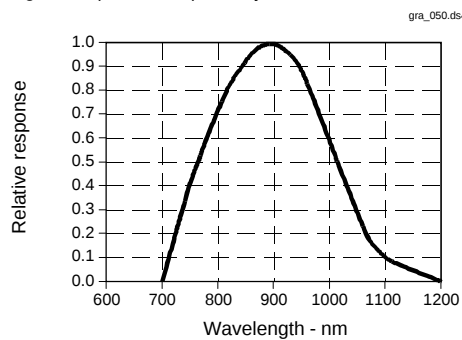


Fig. 5 Spectral Responsivity



All Performance Curves Show Typical Values

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