

# ISL76671

## Absolute Maximum Ratings (T<sub>A</sub> = +25°C)

|   |  |
|---|--|
| Supply Voltage Between V <sub>DD</sub> and GND        | 3.6V                                       |
| R <sub>EXT</sub>                                      | (-0.5V + GND) to (0.5V + V <sub>DD</sub> ) |
| V <sub>OUT</sub>                                      | (-0.5V + GND) to (0.5V + V <sub>DD</sub> ) |
| V <sub>OUT</sub> Short Circuit Current                | <10mA                                      |
| ESD Rating  |  |
| Human Body Model (Tested per AEC-Q100-002)            | 2.5kV                                      |
| Machine Model (Tested per AEC-Q100-003)               | 250V                                       |
| Charged Device Model (Tested per AEC-Q100-011)        | 1kV  |
| Latch-up (Tested per AEC-Q100-004, Class II, Level A) | 100mA                                      |

## Thermal Information

|   |                           |                        |
|---|---------------------------|------------------------|
| Thermal Resistance (Typical)                      | θ <sub>JA</sub> (°C/W)    | θ <sub>JC</sub> (°C/W) |
| 6 Ld ODFN (Notes 4, 5)                            | 88                        | 7.94                   |
| Maximum Die Temperature                           | +105°C                    |                        |
| Storage Temperature                               | -40°C to +105°C           |                        |
| Operating Temperature                             | -40°C to +105°C           |                        |
| Pb-Free Reflow Profile (*)                        | see <a href="#">TB477</a> |                        |
| *Peak temperature during solder reflow +260°C max |                           |                        |

**CAUTION:** Do not operate at or near the maximum ratings listed for extended periods of time. Exposure to such conditions may adversely impact product reliability and result in failures not covered by warranty.

### NOTES:

- θ<sub>JA</sub> is measured in free air with the component mounted on a high effective thermal conductivity test board with “direct attach” features. See Tech Brief [TB379](#).
- For θ<sub>JC</sub>, the “case temp” location is the center of the exposed metal pad on the package underside.

**Electrical Specifications** Unless otherwise noted, all parameter limits are established over the recommended operating conditions: V<sub>DD</sub> = 3V, T<sub>A</sub> = -40°C to +105°C, R<sub>EXT</sub> = 100kΩ, no load at V<sub>OUT</sub>, and green LED light. (Typical values are at T<sub>A</sub> = +25°C). **Boldface limits apply across the operating temperature range, -40°C to +105°C.**

| PARAMETER           | DESCRIPTION  | TEST CONDITIONS            | MIN<br>(Note 6) | TYP                    | MAX<br>(Note 6) | UNITS |
|---------------------|--|----------------------------|-----------------|------------------------|-----------------|-------|
| E                   | Range of Input Light Intensity for Square Root Relationship to be Held                   |                            |                 | 0.01 - 100             |                 | Lux   |
| V <sub>DD</sub>     | Operating Supply Voltage   |                            | <b>1.8</b>      |                        | <b>3</b>        | V     |
| I <sub>DD</sub>     | Supply Current   | E = 0 lux, -40°C to +60°C  |                 | 0.7                    | 2               | μA    |
|                     |  | E = 0 lux, -40°C to +105°C |                 |                        | 5               | μA    |
|                     |  | E = 100 lux                |                 | 23                     | <b>35</b>       | μA    |
| V <sub>OUT</sub>    | Light-to-Voltage Accuracy  | E = 10 lux                 |                 | 0.65                   |                 | V     |
|                     |  | E = 50 lux                 |                 | 1.35                   |                 | V     |
|                     |  | E = 100 lux                | <b>1.4</b>      | 1.85                   | <b>2.3</b>      | V     |
| V <sub>DARK</sub>   | Voltage Output in the Absence of Light   | E = 0 lux, -40°C to +60°C  |                 | 0.95                   | 20              | mV    |
|                     |  | E = 0 lux, -40°C to +105°C |                 |                        | 120             | mV    |
| ΔV <sub>OUT</sub>   | Output Voltage Variation Over Three Light Sources: Fluorescent, Incandescent and Halogen |                            |                 | 10                     |                 | %     |
| PSRR                | Power Supply Rejection Ratio   | E = 100 lux                |                 | 0.12                   |                 | mV/V  |
| V <sub>O-CMPL</sub> | Maximum Output Compliance Voltage at 95% of Nominal Output                               |                            |                 | V <sub>DD</sub> - 0.7V |                 | V     |
| V <sub>O-MAX</sub>  | Maximum Output Voltage Swing   |                            |                 |                        | V <sub>DD</sub> | V     |
| t <sub>R</sub>      | Rise Time  | E = 0 lux to 100 lux       |                 | 95                     |                 | μs    |
| t <sub>F</sub>      | Fall Time  | E = 100 lux to 0 lux       |                 | 155                    |                 | μs    |
| t <sub>D</sub>      | Delay Time for Rising Edge   | E = 0 lux to 100 lux       |                 | 350                    |                 | μs    |
| t <sub>S</sub>      | Delay Time for Falling Edge  | E = 100 lux to 0 lux       |                 | 250                    |                 | μs    |
| ISC                 | Short Circuit Current of Op Amp  |                            |                 | ±12                    |                 | mA    |
| SR                  | Slew Rate of Op Amp  |                            |                 | 13                     |                 | V/ms  |
| V <sub>OS</sub>     | Offset Voltage of Op Amp   |                            |                 | ±0.9                   |                 | mV    |

### NOTE:

- Parameters with MIN and/or MAX limits are 100% tested at +25°C, unless otherwise specified. Temperature limits established by characterization and are not production tested.

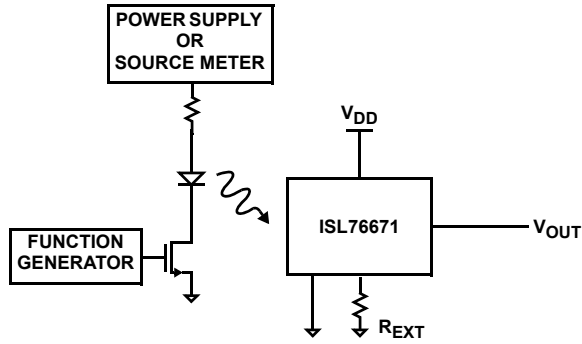


FIGURE 2. TEST CIRCUIT FOR RISE/FALL TIME MEASUREMENT

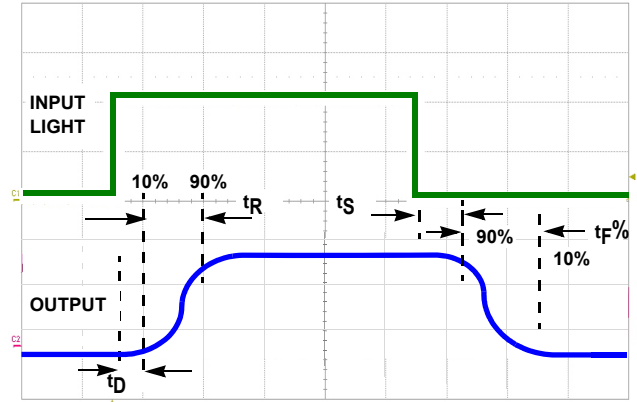


FIGURE 3. TIMING DIAGRAM

## Typical Performance Curves

$V_{DD} = 3V$ ,  $T_A = +25^\circ C$ ,  $R_{EXT} = 100k\Omega$ , no load at  $V_{OUT}$ , green LED light, unless otherwise specified.

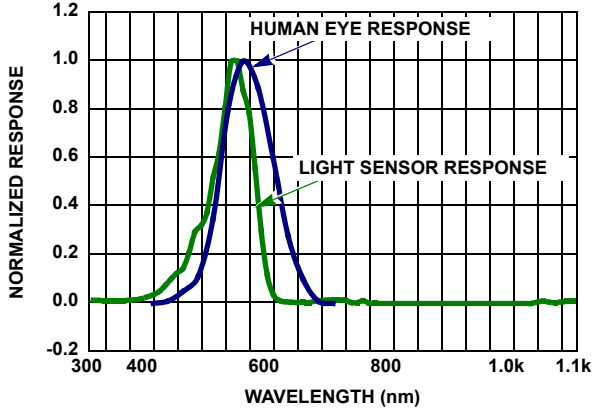


FIGURE 4. SPECTRAL RESPONSE

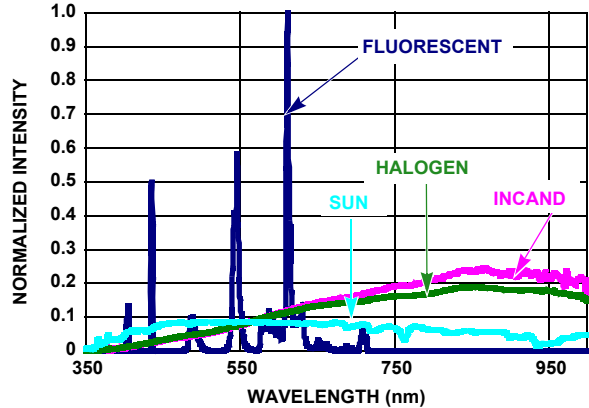


FIGURE 5. SPECTRUM OF FOUR LIGHT SOURCES NORMALIZED BY LUMINOUS INTENSITY (LUX)

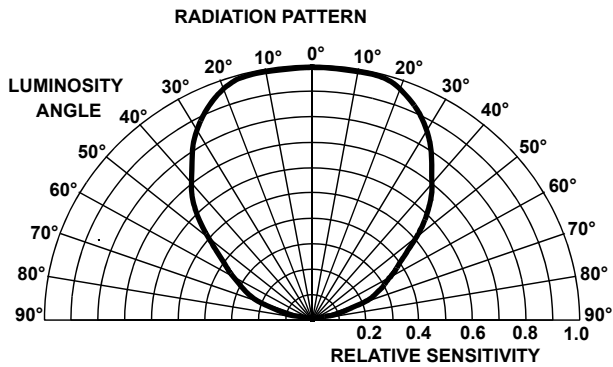


FIGURE 6. RADIATION PATTERN

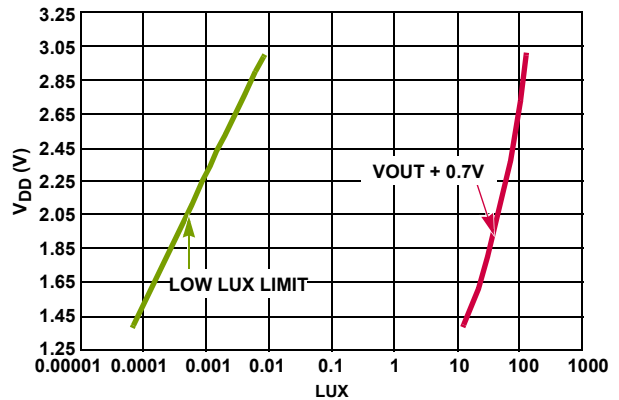


FIGURE 7.  $V_{DD}$  OPERATING RANGE (WHITE LED)