Absolute Maximum Ratings (T_A = +25°C)

Supply Voltage Between V_{DD} and GND 3.6V
R_{EXT} . . . . . (-0.5V + GND) to (0.5V + V_{DD})
V_{OUT} . . . . . (-0.5V + GND) to (0.5V + V_{DD})
V_{OUT} 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_{JA} (°C/W)	θ_{JC} (°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 TB477
*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:

4. θ_{JA} 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.
5. For θ_{JC}, 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_{DD} = 3V, T_A = -40°C to +105°C, R_{EXT} = 100kΩ, no load at V_{OUT}, and green LED light. (Typical values are at T_A = +25°C). **Boldface limits apply across the operating temperature range, -40°C to +105°C.**

PARAMETER	DESCRIPTION	TEST CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNITS
E	Range of Input Light Intensity for Square Root Relationship to be Held			0.01 - 100		Lux
V_{DD}	Operating Supply Voltage		**1.8**		**3**	V
I_{DD}	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	**35**	µA
V_{OUT}	Light-to-Voltage Accuracy	E = 10 lux		0.65		V
		E = 50 lux		1.35		V
		E = 100 lux	**1.4**	1.85	**2.3**	V
V_{DARK}	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_{OUT}	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_{O-CMPL}	Maximum Output Compliance Voltage at 95% of Nominal Output			V_{DD} - 0.7V		V
V_{O-MAX}	Maximum Output Voltage Swing				V_{DD}	V
t_R	Rise Time	E = 0 lux to 100 lux		95		µs
t_F	Fall Time	E = 100 lux to 0 lux		155		µs
t_D	Delay Time for Rising Edge	E = 0 lux to 100 lux		350		µs
t_S	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_{OS}	Offset Voltage of Op Amp			±0.9		mV

NOTE:

6. 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.

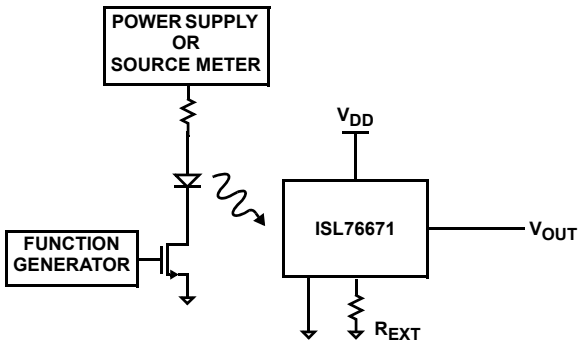

FIGURE 2. TEST CIRCUIT FOR RISE/FALL TIME MEASUREMENT

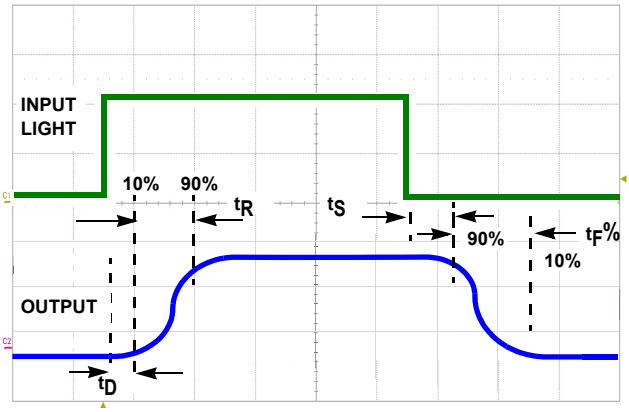

FIGURE 3. TIMING DIAGRAM

Typical Performance Curves

V_{DD} = 3V, T_A = +25°C, R_{EXT} = 100kΩ, no load at V_{OUT}, green LED light, unless otherwise specified.

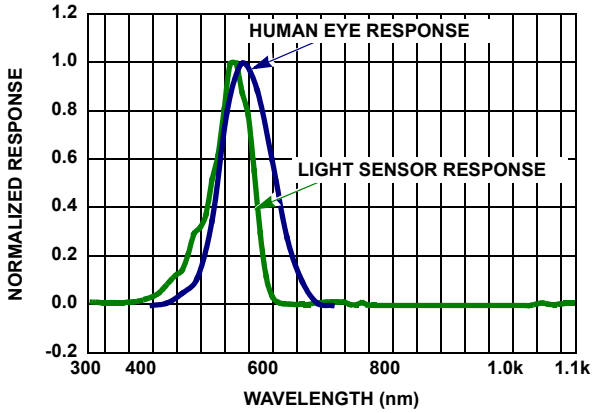

FIGURE 4. SPECTRAL RESPONSE

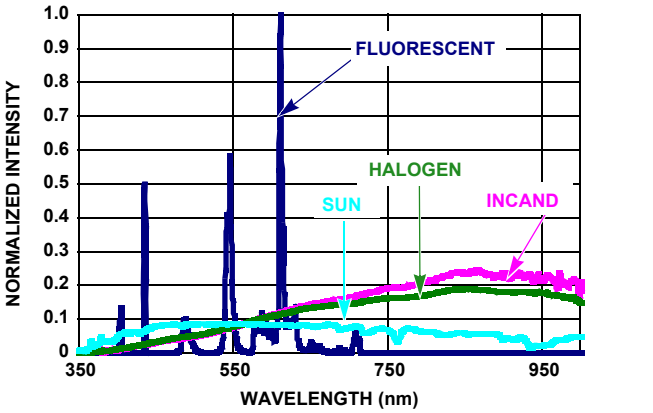

FIGURE 5. SPECTRUM OF FOUR LIGHT SOURCES NORMALIZED BY LUMINOUS INTENSITY (LUX)

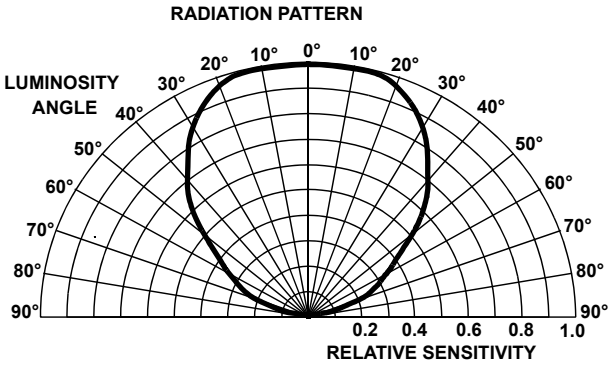

FIGURE 6. RADIATION PATTERN

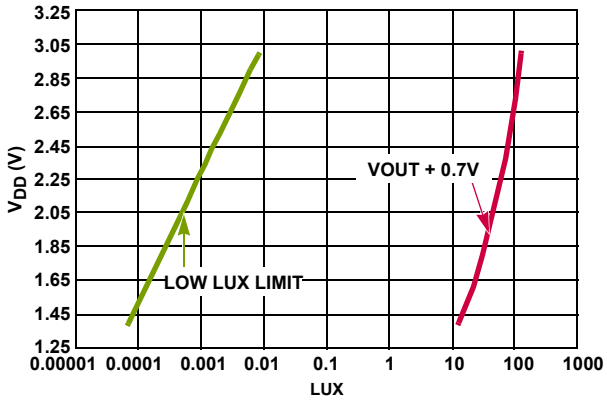

FIGURE 7. V_{DD} OPERATING RANGE (WHITE LED)