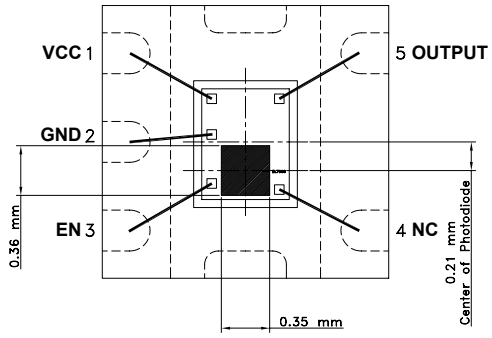
Ambient Light Photo Detect IC

The ISL29000 is a light-to-current optical sensor combining a photodiode and a current amplifier on a single monolithic IC. Output current is directly proportionate to the light intensity on the photodiode. Its sensitivity is superior to that of a phototransistor and exhibits little variation. Its spectral sensitivity matches closely to the luminous efficiency and linearity.

Housed in an ultra-compact surface mount clear plastic package, this device is excellent for power saving control function in cell phones, PDAs, and other handheld applications.

Pinout

ISL29000
(5-PIN DFN)
TOP VIEW



Features

- Monolithic IC containing photodiode and amplifier
- Converts light intensity to current
- 2.5V to 5.5V supply range
- Low supply current - 1µA
- Excellent output linearity of luminance
- Ultra-compact and light surface mount package
- Pb-Free plus anneal available (RoHS compliant)

Applications

- Mobile phones
- Notebook PCs
- PDAs
- Video cameras
- Digital cameras

Ordering Information

PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
ISL29000IROZ (See Note)	5-Pin ODFN (Pb-free)	-	MDP0052

NOTE: Intersil Pb-free plus anneal products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

Absolute Maximum Ratings (T_A = 25°C)

Supply Voltage between V_{SD} and GND 6V
Maximum Continuous Output Current . . . . . TBD
Operating Temperature . . . . . .-40°C to +85°C
Maximum Die Temperature . . . . . .+125°C
Storage Temperature . . . . . .-65°C to +150°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typical values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: $T_J = T_C = T_A$

Electrical Specifications

V_{CC} = 3V, T_A = 25°C, fluorescent light, unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITION	MIN	TYP	MAX	UNIT
I_{CC}	Supply Current	R_L = 1kΩ, EV = 1000lx		74		µA
		EV = 0		0.2		µA
I_{L1}	Light Current	EV = 1000lx	45	61	75	µA
I_{L2}	Light Current	EV = 100lx		6.5		µA
I_{LEAK}	Dark Current	EV = 0		0.06		µA
V_{O-MAX}	Maximum Output Compliance Voltage	At 95% of normal output current, EV = 1000lx		2.7		V
T_R	Rise Time (See Note)	R_L = 5kΩ, EV = 1000lx		27	50	µs
T_F	Fall Time (See Note)	R_L = 5kΩ, EV = 1000lx		78	110	µs
T_D	Delay Time for Rising Edge (See Note)	R_L = 5kΩ, EV = 1000lx		80	110	µs
T_S	Delay Time for Falling Edge (See Note)	R_L = 5kΩ, EV = 1000lx		35	50	µs
V_{LO}	Maximum Voltage at EN Pin to Enable				0.6	V
V_{HI}	Minimum Voltage at EN Pin to Disable		1.8			V

NOTE: Switching time measurement is based on Figures 1 and 2.

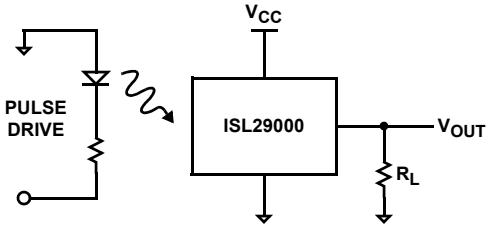


FIGURE 1. RISE/FALL TIME MEASUREMENT

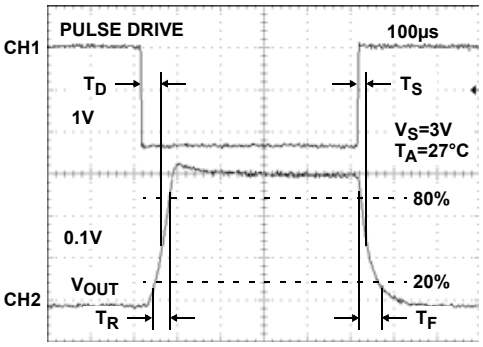


FIGURE 2.

Typical Performance Curves

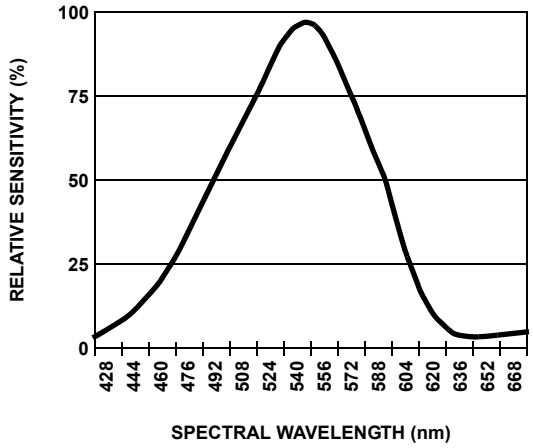


FIGURE 3. RELATIVE SENSITIVITY

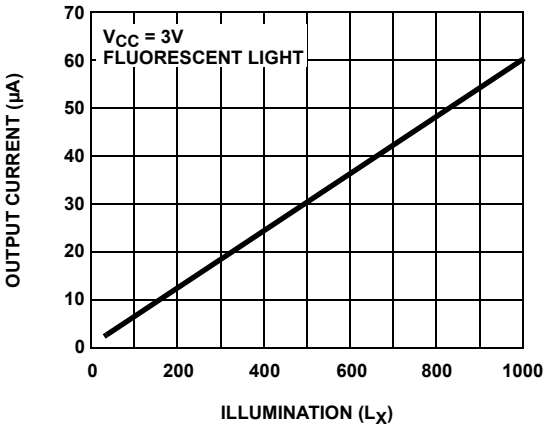


FIGURE 4. SENSITIVITY

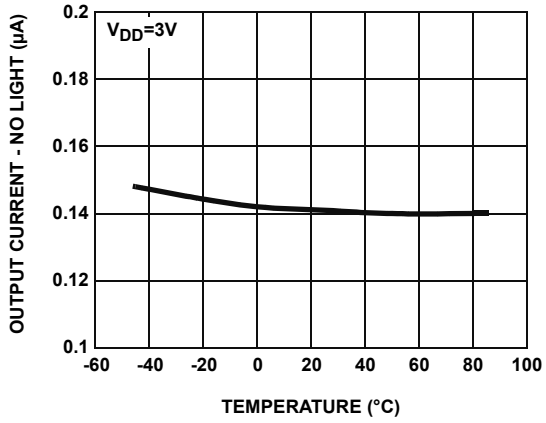


FIGURE 5. DARK CURRENT vs TEMPERATURE

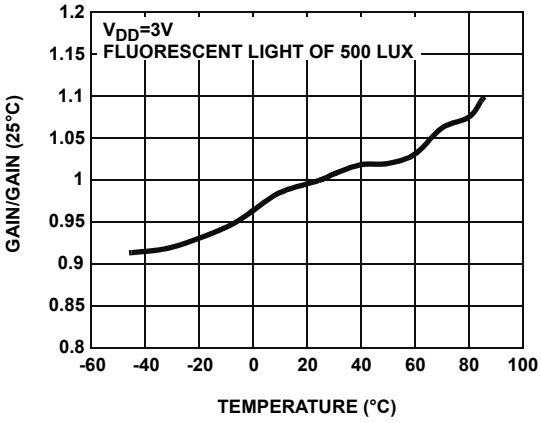


FIGURE 6. GAIN vs TEMPERATURE

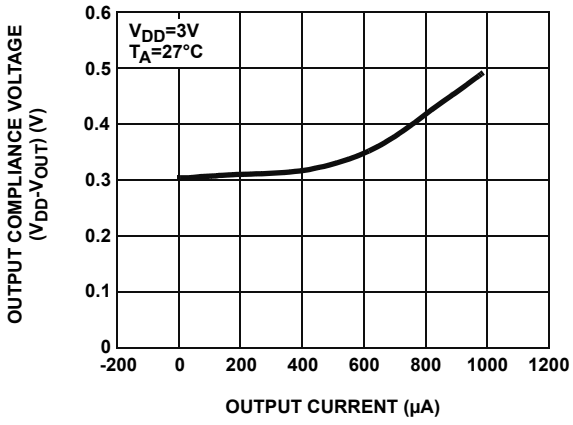
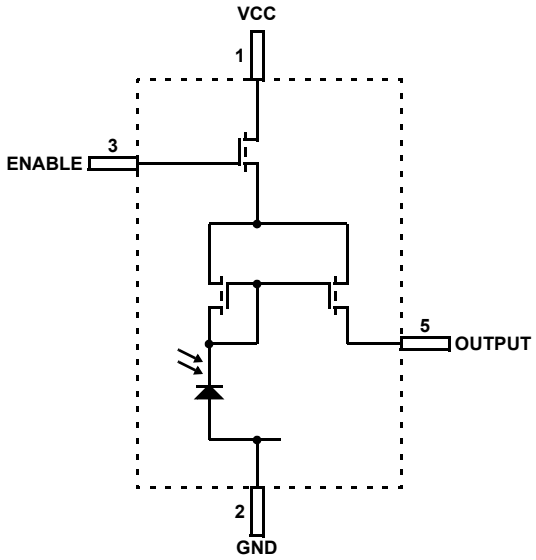


FIGURE 7. OUTPUT COMPLIANCE VOLTAGE vs CURRENT

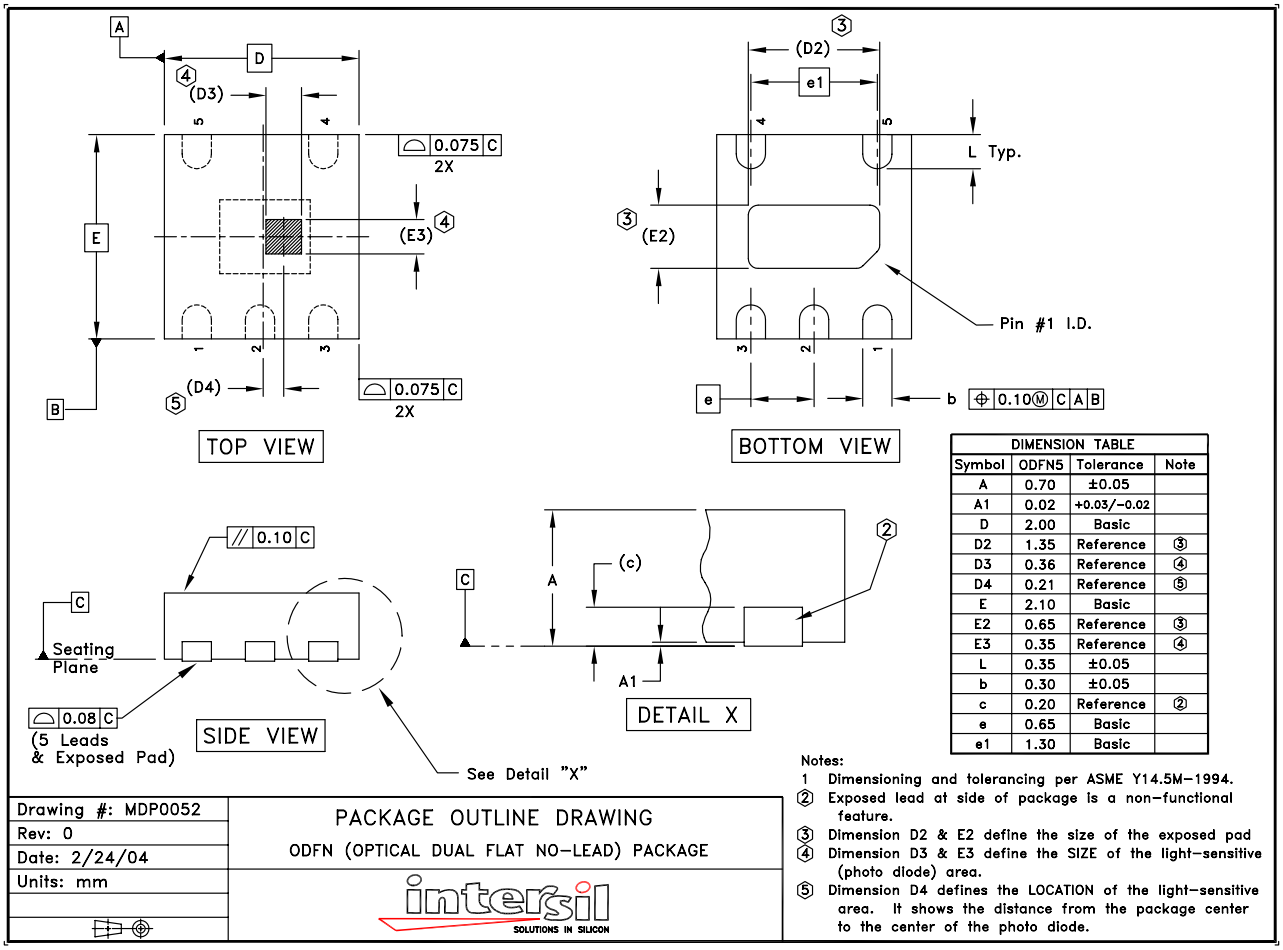
Pin Descriptions

PIN	NAME	DESCRIPTION
1	VCC	Supply, 2.5V to 5.5V
2	GND	Ground
3	EN	Enable
4	NC	No connect
5	Output	Current output pin

Block Diagram



Package Outline Drawing



DIMENSION TABLE			
Symbol	ODFN5	Tolerance	Note
A	0.70	±0.05	
A1	0.02	+0.03/−0.02	
D	2.00	Basic	
D2	1.35	Reference	③
D3	0.36	Reference	④
D4	0.21	Reference	⑤
E	2.10	Basic	
E2	0.65	Reference	③
E3	0.35	Reference	④
L	0.35	±0.05	
b	0.30	±0.05	
c	0.20	Reference	②
e	0.65	Basic	
e1	1.30	Basic	

Notes:
1. Dimensioning and tolerancing per ASME Y14.5M−1994.
2. Exposed lead at side of package is a non−functional feature.
3. Dimension D2 & E2 define the size of the exposed pad
4. Dimension D3 & E3 define the SIZE of the light−sensitive (photo diode) area.
5. Dimension D4 defines the LOCATION of the light−sensitive area. It shows the distance from the package center to the center of the photo diode.

NOTE: The package drawing shown here may not be the latest version. To check the latest revision, please refer to the Intersil website at http://www.intersil.com/design/packages/index.asp