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LV0111CF

Monolithic Linear IC

Ambient Light Sensor, Logarithmic Current Output, with Standby Function, Ultra-small Package

Overview

LV0111CF is a Photo IC for micro-sized ambient light sensor which has the characteristics of spectral response similar to that of human eyes. It is suitable for the applications like mobile phone (for Digital-TV, One-segment), LCD-TV, laptop computer, PDA, DSC and Camcorder. It is good for a free halogen.

Functions

- Logarithm current output
- Excellent luminous efficiency function
- Built-in sleep function
- Low current consumption

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$		6	V
Operating temperature	T_{opr}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +100	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Recommended Operating Conditions and Operating Voltage Range at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended supply voltage	V_{CC}		2.3	2.5	5.5	V
SW pin low voltage	V_l	Sleep mode	0		0.4	V
SW pin high voltage	V_h	Normal mode	1.5		V_{CC}	V

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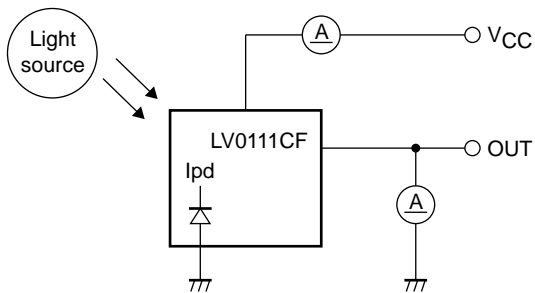
Electrical and optical characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 2.5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation *1, *3	I_{CC}	$E_v = 1000 \text{ lx}$, $R_L = 27\text{k}\Omega$	50	75	100	μA
Sleep current	I_{sl}	$E_v = 0 \text{ lx}$		0.01	0.1	μA
Output current (1) *1, *3	I_{O1}	$E_v = 100 \text{ lx}$	18	21	24	μA
Output current (2) *1, *3	I_{O2}	$E_v = 1000 \text{ lx}$	27	31	35	μA
Dark current	I_{leak}	$E_v = 0 \text{ lx}$		0.35	0.5	μA
Temperature coefficient *2	I_{tc}	$E_v = 100 \text{ lx}$		0.1		$\%/^\circ\text{C}$
Rise time *4	T_{r1}	$E_v = 1000 \text{ lx}$		40	100	μs
Fall time *4	T_{f1}	$E_v = 1000 \text{ lx}$		2	5	ms
Peak sensitivity wave length *2	λ_p			550		nm

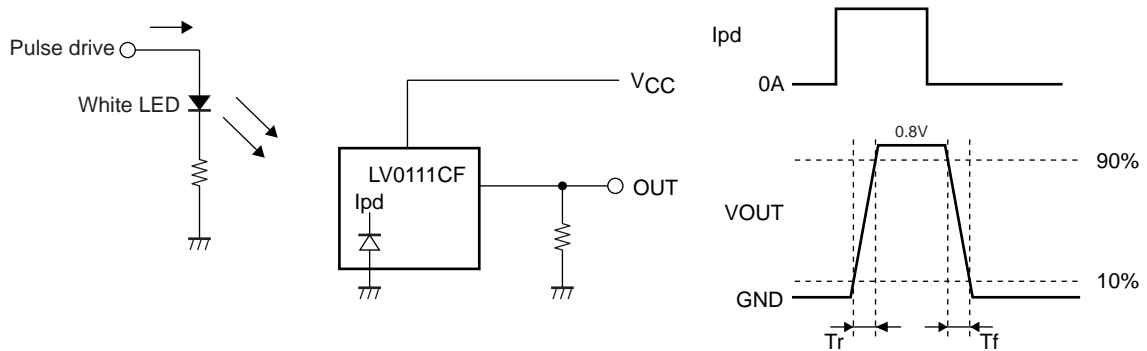
*1. Measured with the standard light source A. White LED is used instead in the mass production line.

*2. Design guaranteed item

*3. Test circuit for measuring current dissipation and output current



*4. Measuring method of rise time (T_r) and fall time (T_f)

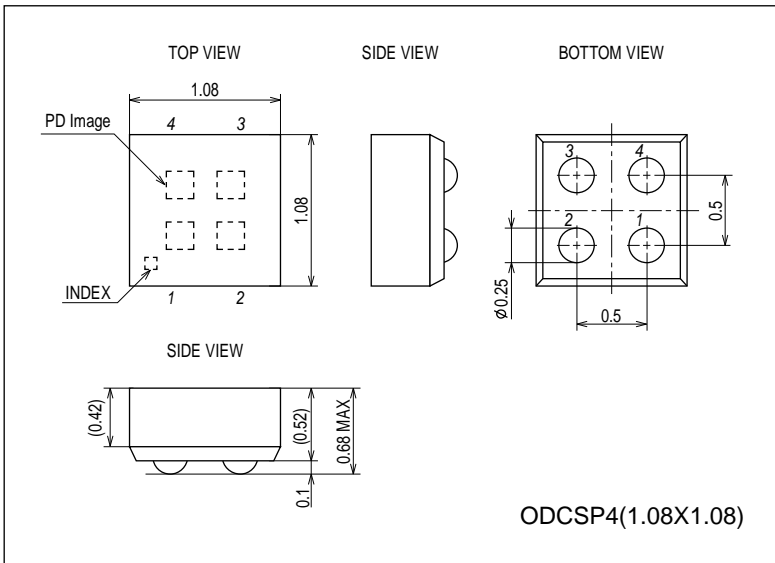


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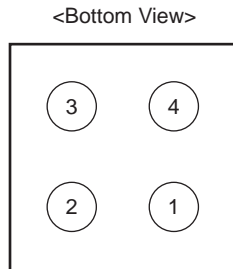
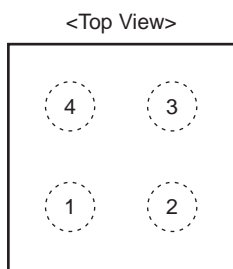
Package Dimensions

unit : mm (typ)

3371



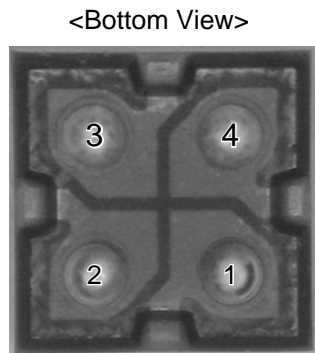
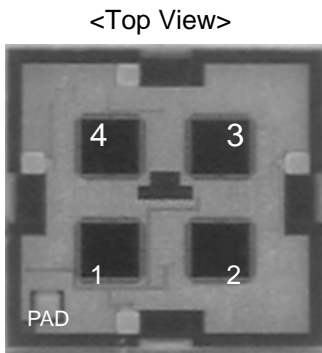
Pad Layout



Pin No.	Pin Name	Function
1	VCC	Power supply
2	EN	Enable
3	GND	Ground
4	OUT	Output

Ball pitch : 0.5mm, Ball size : 0.25mm ϕ

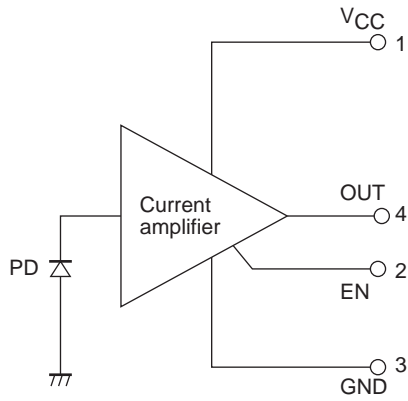
Pad Layout (Photos)



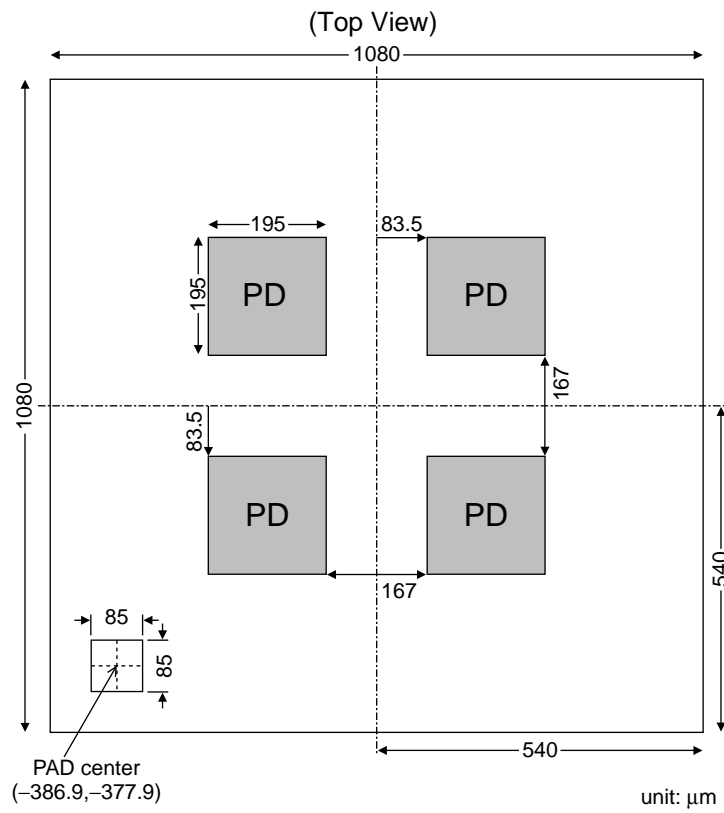
* The position with PAD becomes pin 1.

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Internal Block Diagram

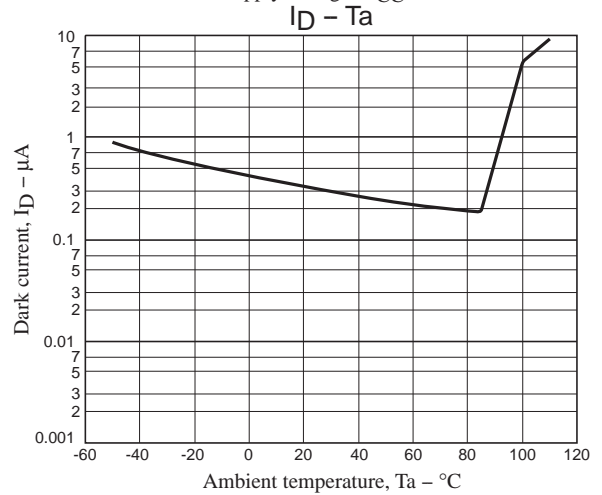
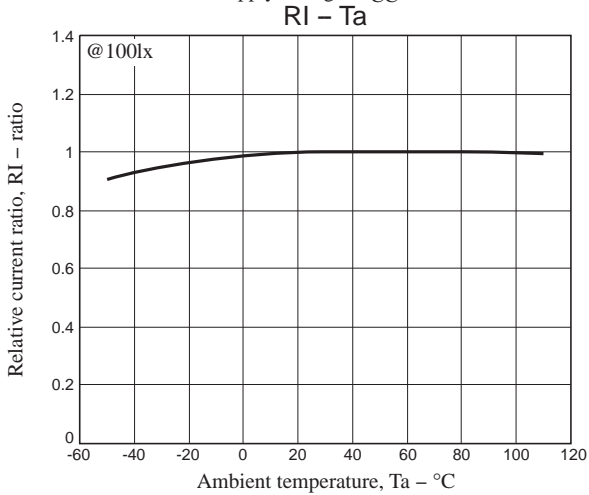
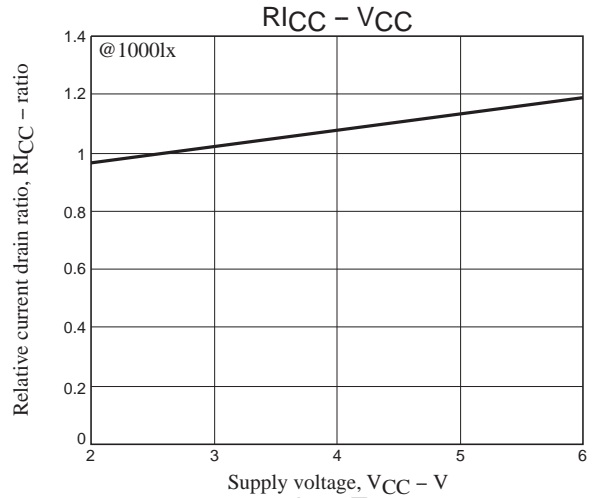
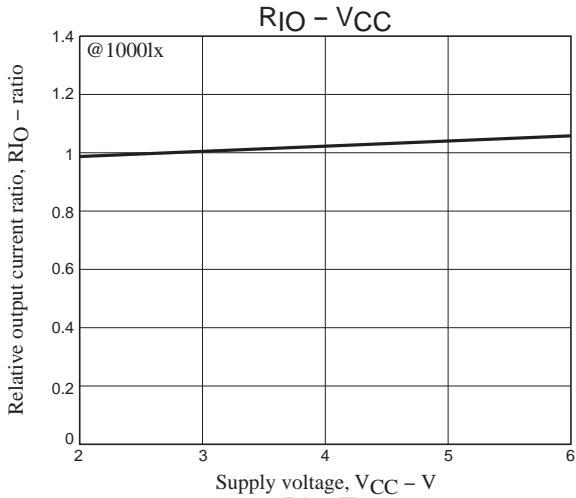
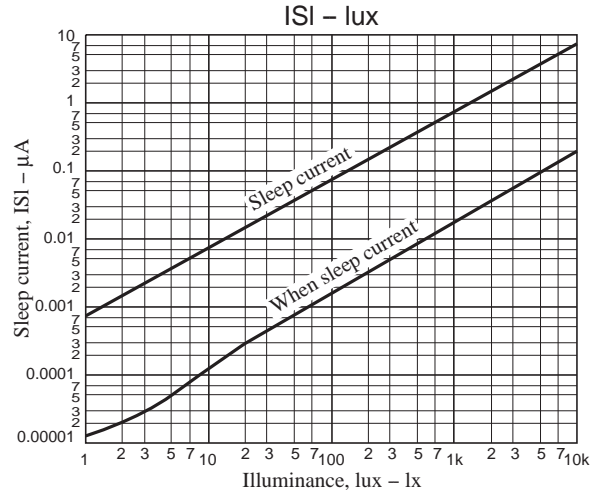
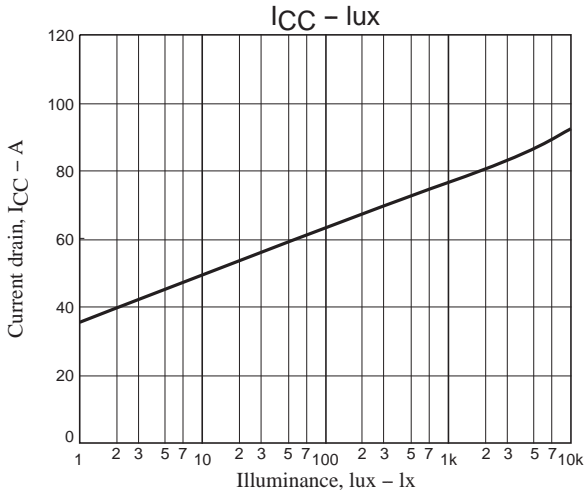
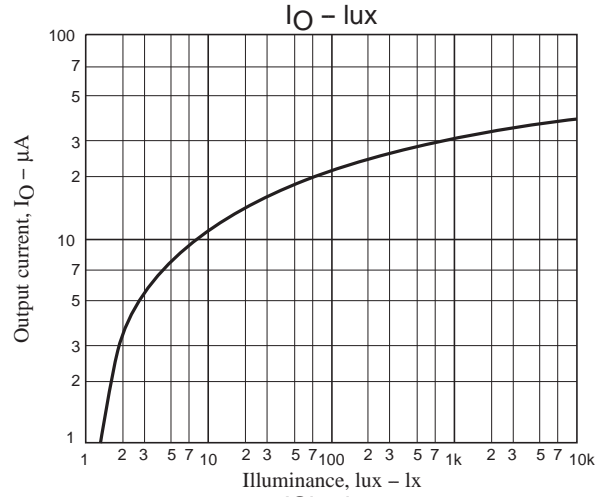
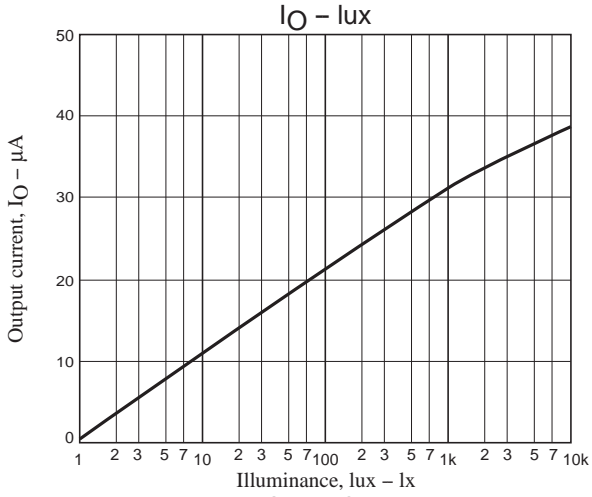


Chip Pattern Diagram

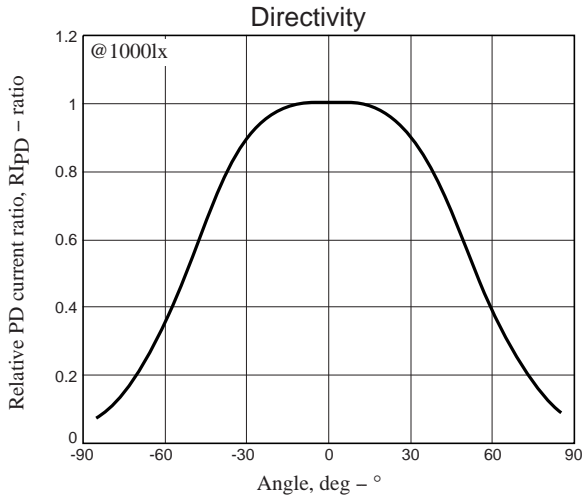
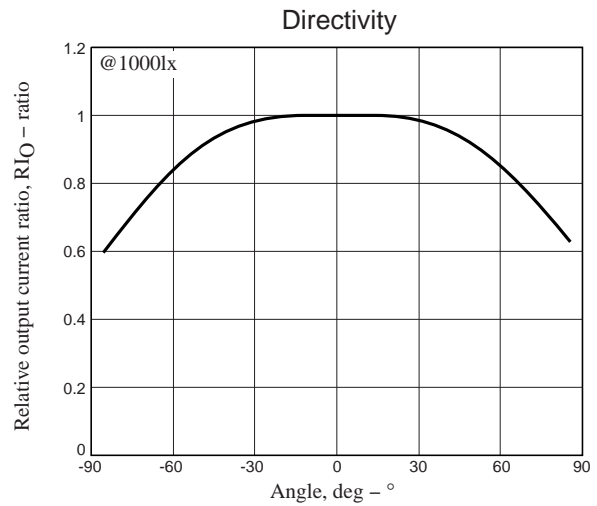
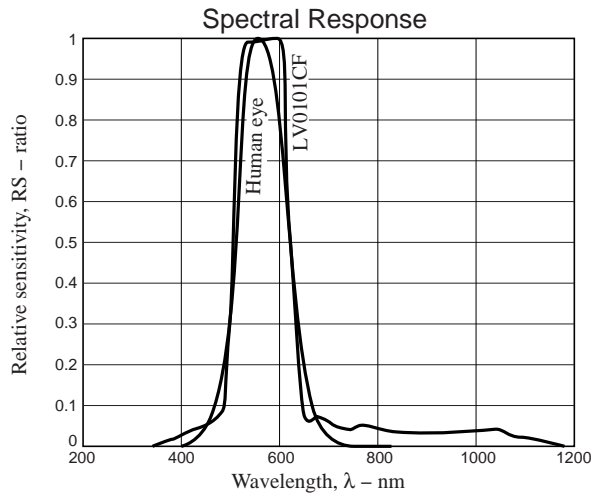


* The PAD becomes pin 1.

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