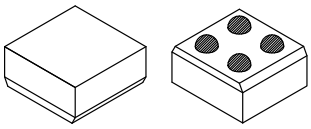
LV0111CF

Ambient Light Sensor, Logarithmic Current Output, with Standby Function

ON Semiconductor®
www.onsemi.com



ODCSP4J 1.08 mm x 1.08 mm

ORDERING INFORMATION

Ordering Code:
LV0111CF-TLM-H

Package
ODCSP4J
(Pb-Free / Halogen Free)

Shipping (Qty / packing)
5000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Overview

LV0111CF is a Photo IC for ultra-small package 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 goods for a free halogen.

Features

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

Typical Applications

- Ambient Light Sensor
- Feature phone, Smart phone, …
- Digital TV : (CRT, LCD, OLED, …)
- DSC, DVC, DSLR, Mirrorless, …

SPECIFICATION

ABSOLUTE MAXIMUM RATINGS at Ta = 25°C (Note 1)

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		6	V
Operating temperature	Topr		−30 to +85	°C
Storage temperature	Tstg		−40 to +100	°C

1. Stresses exceeding those listed in the Absolute Maximum Rating table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

RECOMMENED OPERATING CONDITIONS AND OPERATING VOLTAGE RANGE at Ta = 25°C (Note 2)

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

2. Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

ELECTRICAL AND OPTICAL CHARACTERISTICS at Ta = 25°C, V_{CC} = 2.5V (Note 3)

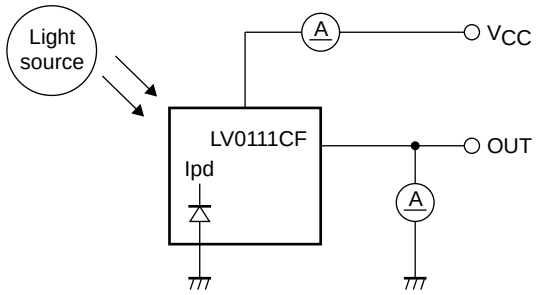
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation (Note 4, 6)	I_{CC}	Ev = 1000 lx, R_L = 27kΩ	50	75	100	μA
Sleep current	Isl	Ev = 0 lx		0.01	0.1	μA
Output current (1) (Note 4, 6)	I_O1	Ev = 100 lx	18	21	24	μA
Output current (2) (Note 4, 6)	I_O2	Ev = 1000 lx	27	31	35	μA
Dark current	I_{leak}	Ev = 0 lx		0.35	0.5	μA
Temperature coefficient (Note 5)	Itc	Ev = 100 lx		0.1		%/°C
Rise time (Note 7)	Tr1	Ev = 1000 lx		40	100	μs
Fall time (Note 7)	Tf1	Ev = 1000 lx		2	5	ms
Peak sensitivity wave length (Note 5)	λp			550		nm

3. Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

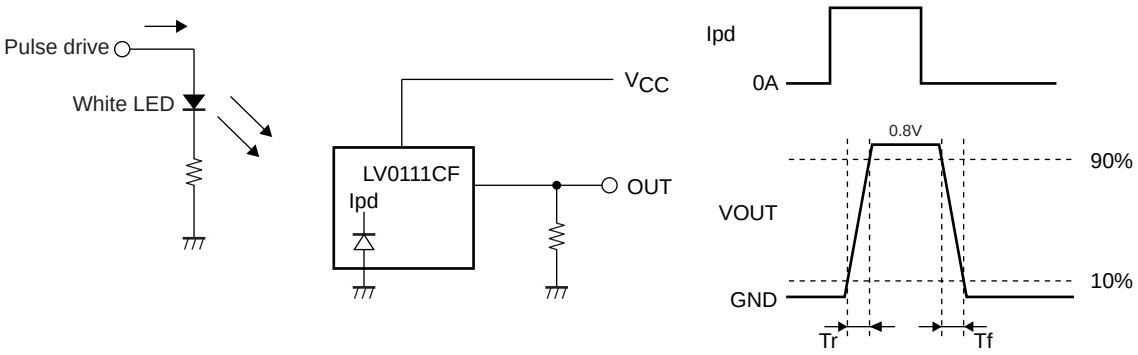
4. Measured with the standard light source A. White LED is used instead in the mass production line.

5. Design guaranteed item

6. Test circuit for measuring current dissipation and output current

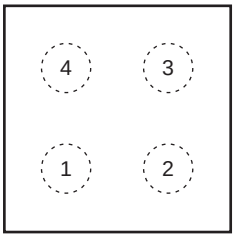


7. Measuring method of rise time (Tr) and fall time (Tf)

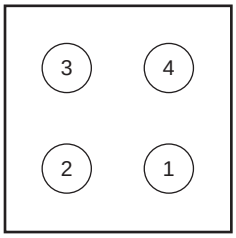


PAD LAYOUT

<Top View>



<Bottom View>

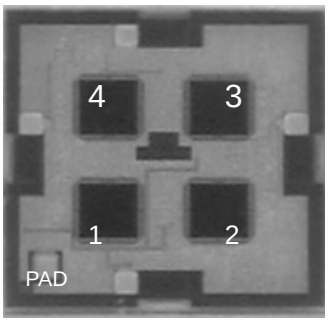


Pin No.	Pin Name	Function
1	V_{CC}	Power supply
2	EN	Enable
3	GND	Ground
4	OUT	Output

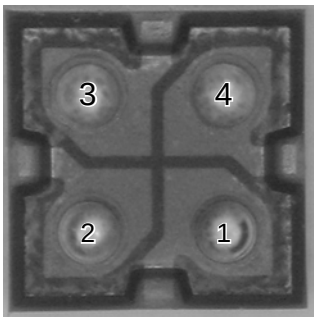
Ball pitch : 0.5mm, Ball size : 0.25mmϕ

PAD LAYOUT (Photos)

<Top View>

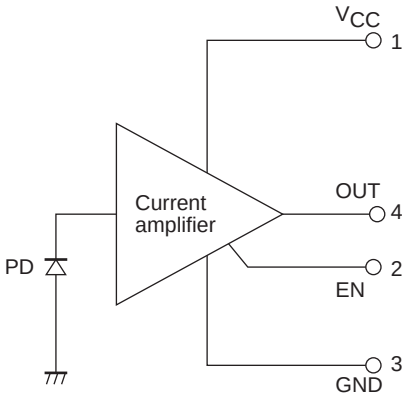


<Bottom View>

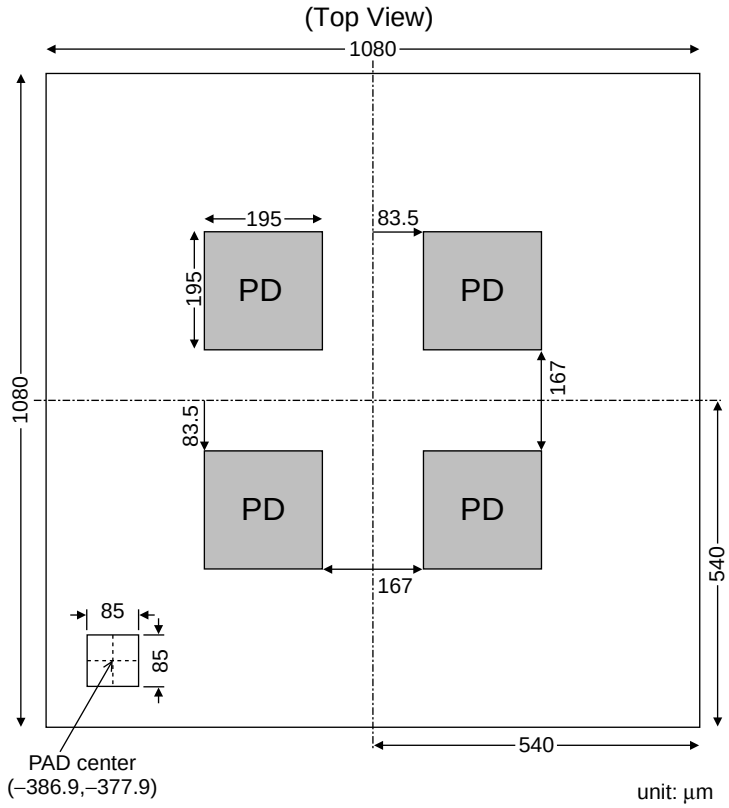


* The position with PAD becomes pin 1.

Internal Block Diagram

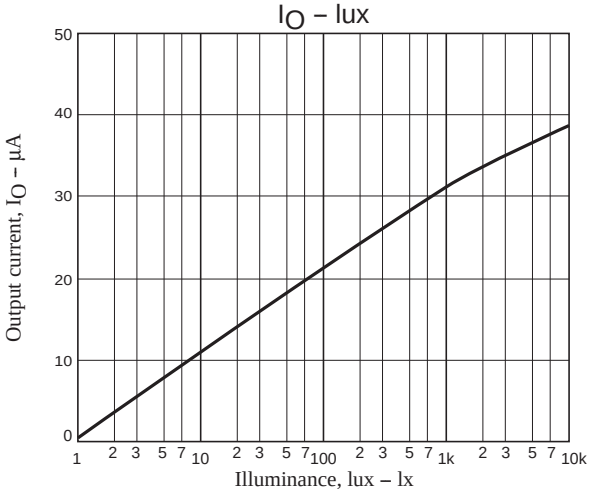


Chip Pattern Diagram

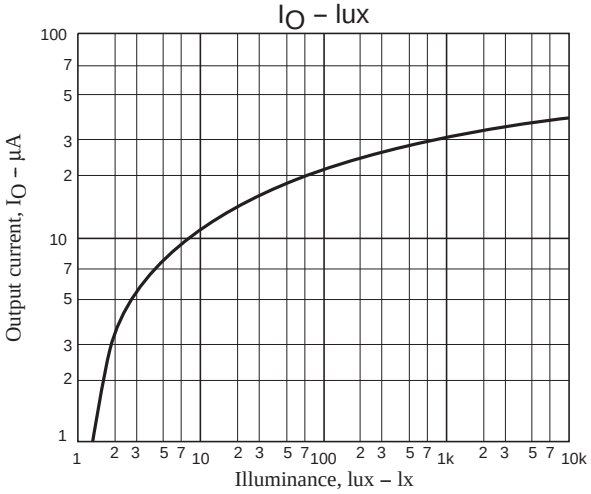


* The PAD becomes pin 1.

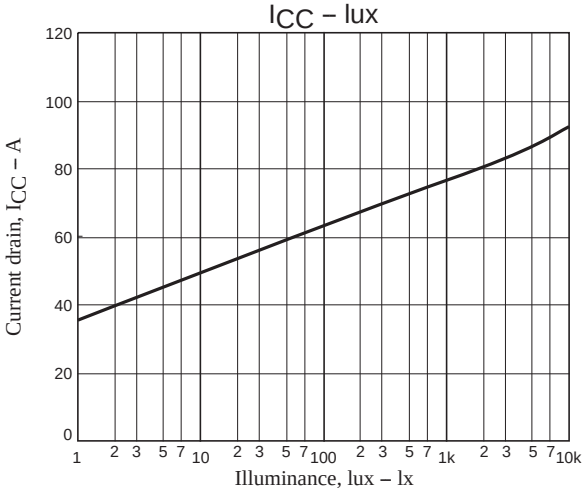
I_O – lux



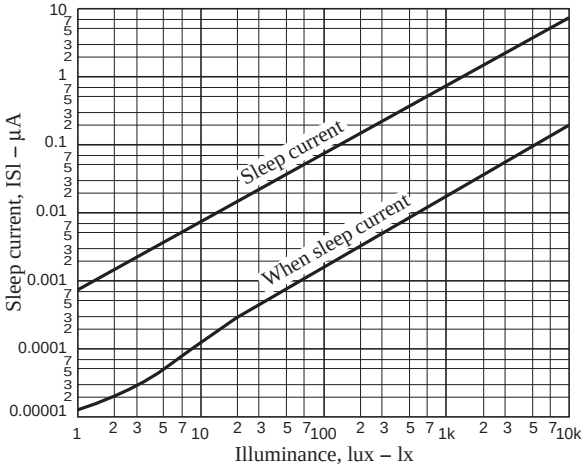
I_O – lux



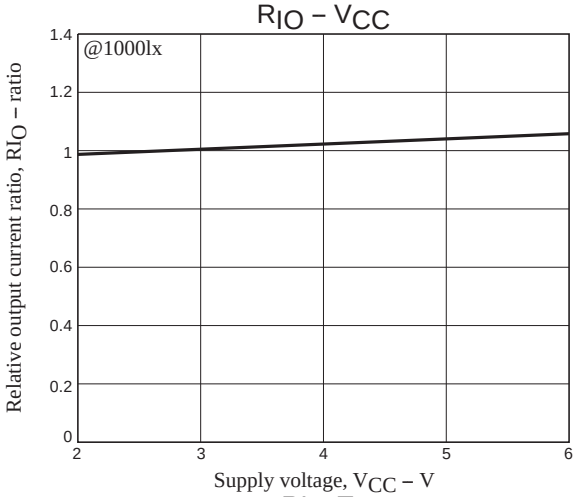
I_{CC} – lux



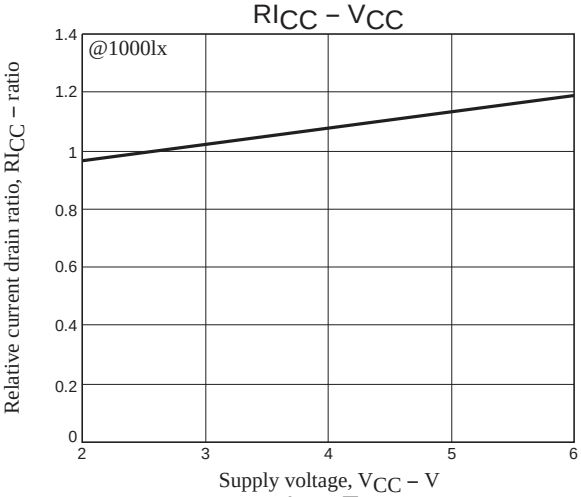
ISl – lux



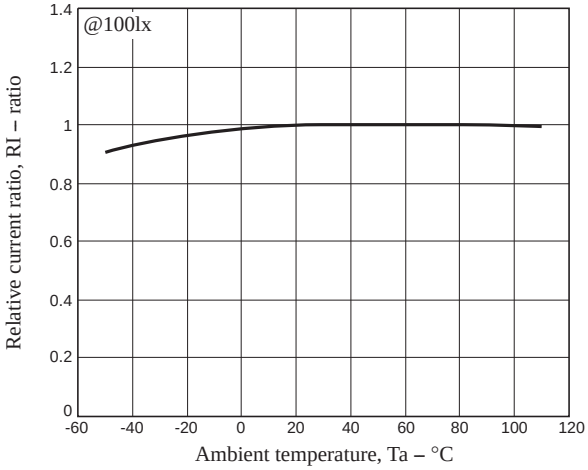
RI_O – V_{CC}



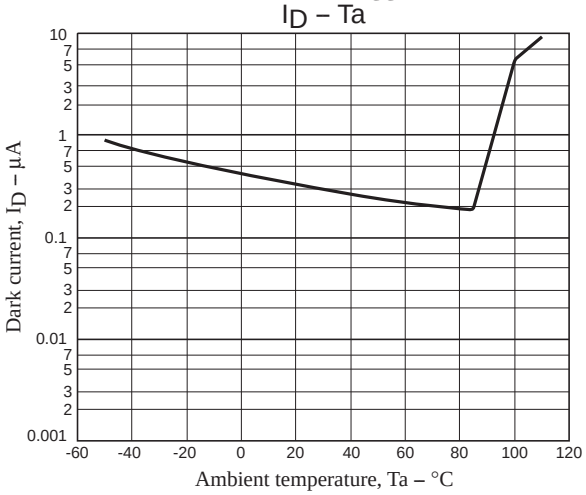
RI_{CC} – V_{CC}

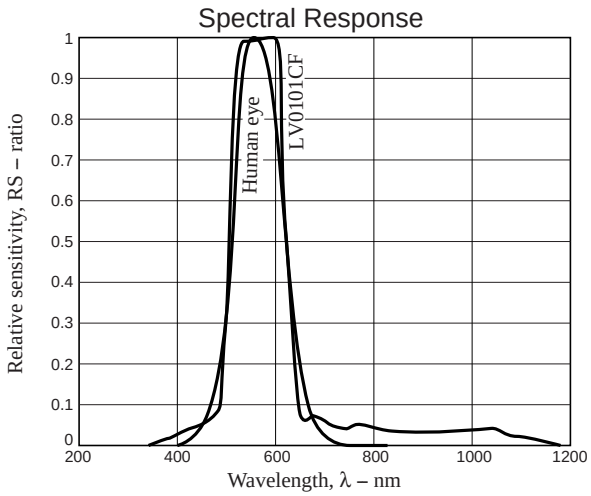


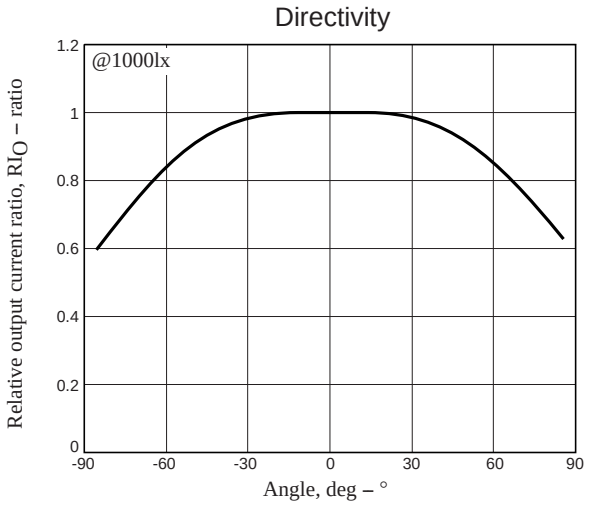
RI – Ta

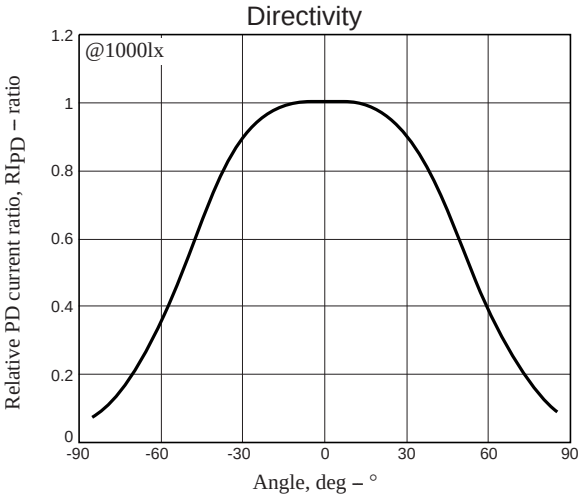


I_D – Ta




Spectral Response
Relative sensitivity, RS – ratio
Human eye
LV0101CF
Wavelength, λ – nm

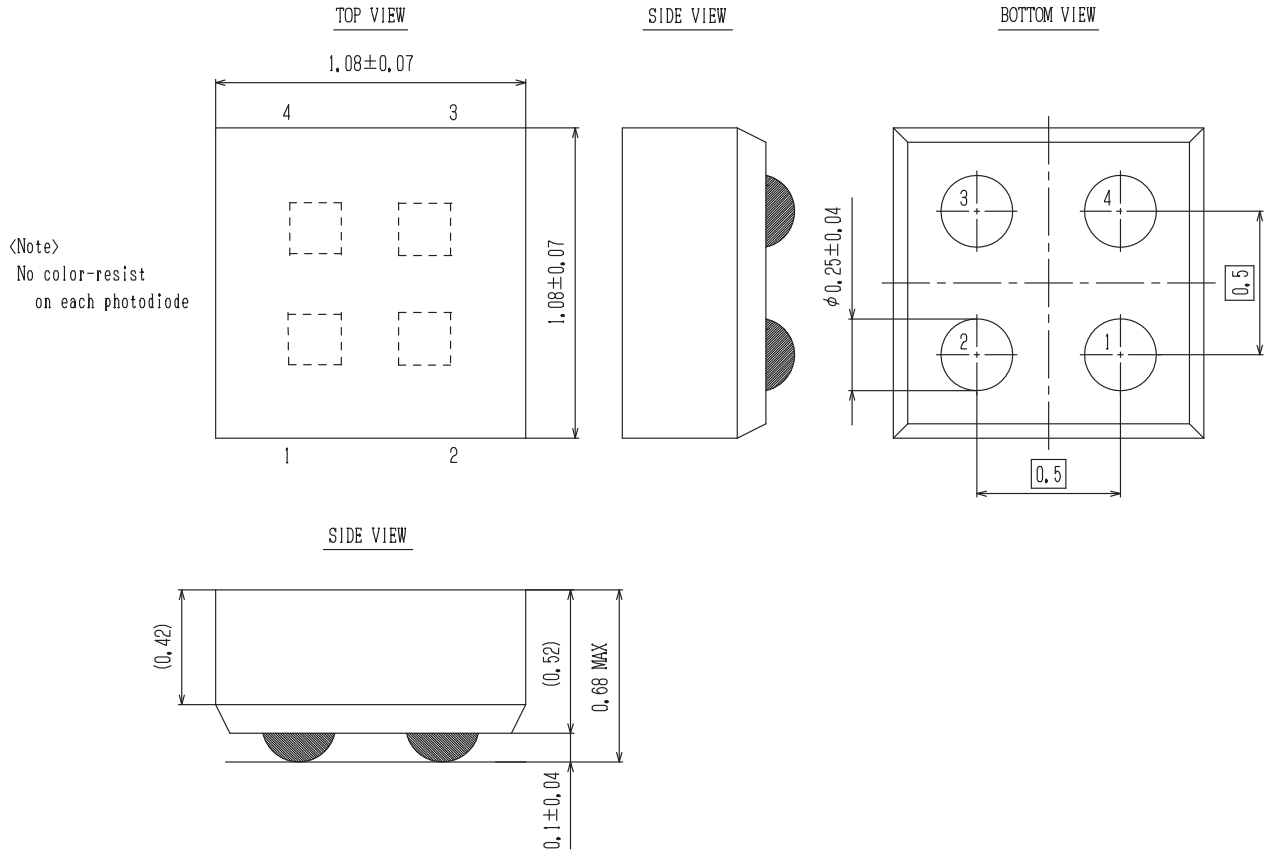

Directivity
@1000lx
Relative output current ratio, RIO – ratio
Angle, deg – °


Directivity
@1000lx
Relative PD current ratio, RIPD – ratio
Angle, deg – °

PACKAGE DIMENSIONS

unit : mm

ODCSP4J 1.08x1.08
CASE 570AD
ISSUE O



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