LV0104CS

Ambient Light Sensor, I²C Interface

ON Semiconductor®
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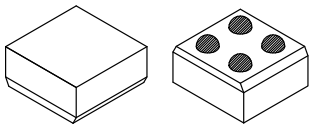


ODCSP4 1.08 mm x 1.08 mm

Overview

LV0104CS 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.

Features

- Smallest OD-CSP package in the world (1.08mm × 1.08mm, thickness : 0.6mm)
- Great spectrum sensitivity characteristic
- 16-Bit Digital Output for I2C-BUS
- Low Current consumption, Integrated Sleep function

Typical Applications

- Mobile Phone (Digital-TV, One-segment)
- LCD-TV
- Laptop Computer
- PDA
- DSC
- Camcorder

ORDERING INFORMATION

Ordering Code:
LV0104CS-TLM-H

Package
ODCSP4
(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

SPECIFICATION

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

Parameter	Symbol	Conditions	Ratings	Unit
Power Supply Voltage	V_{DD}		4.0	V
Logic I/O levels	V_{IO}		−0.3 to V_{DD}+0.3	V
Operating temperature range	Topr		−30 to 85	°C
Storage temperature range	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, 3)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended Supply Voltage	$V_{DD\ op}$		2.3	2.5	3.6	V
Input low level voltage	$V_{I}L$	SCL, SDA			0.55	V
Input high level voltage	$V_{I}H$	SCL, SDA, V_{DD}=2.8V	1.26			V
Output low level voltage	$V_{O}L$	SDA, IOL=3mA			0.4	V
Input leak current	I_{LEAK}	SCL, SDA	−5		5	μA

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.
3. I²C interface (SCL,SDA) is for V_{IO}=1.8V operation

* I²C Bus is a trademark of Philips Corporation.

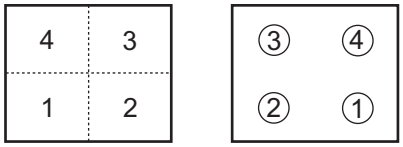
ELECTRICAL AND OPTICAL CHARACTERISTICS at Ta = 25°C, V_{CC} = 2.5V (Note 4)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply Current	I_{DD}	Ev=0 lux		70	100	μA
Sleep Current	I_{SLP}	Sleep mode, Ev=0 lux			1	μA
Internal Oscillator Frequency	f_{OSC}			655		kHz
Dark ADC count value	D0	Ev=0 lux, High gain mode			5	counts
Full scale ADC count value	D max				65535	counts
ADC count value	Data HH	Gain × 8mode, Ev=1000lx		8000		counts
	Data HM	Gain × 2 mode, Ev=1000lx		2000		counts
	Data N	Gain × 1 mode, Ev=1000lx	750	1000	1250	counts
	Data L	Gain × 0.25 mode, Ev=1000lx		250		counts
Resolution	ReHH1	Tint=200ms, Gain × 8 mode		0.125		lx
	ReHH2	Tint=100ms, Gain × 8 mode		0.25		lx
	ReHH3	Tint=12.5ms, Gain × 8 mode		2		lx
	ReHM1	Tint=200ms, Gain × 2 mode		0.5		lx
	ReHM2	Tint=100ms, Gain × 2 mode		1		lx
	ReHM3	Tint=12.5ms, Gain × 2 mode		8		lx
	ReN1	Tint=200ms, Gain × 1 mode		1		lx
	ReN2	Tint=100ms, Gain × 1 mode		2		lx
	ReN3	Tint=12.5ms, Gain × 1 mode		16		lx
	ReL1	Tint=200ms, Gain × 0.25 mode		4		lx
	ReL2	Tint=100ms, Gain × 0.25 mode		8		lx
	ReL3	Tint=12.5ms, Gain × 0.25 mode		64		lx

4. 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.

PAD LAYOUT

<Top view> <Bottom view>

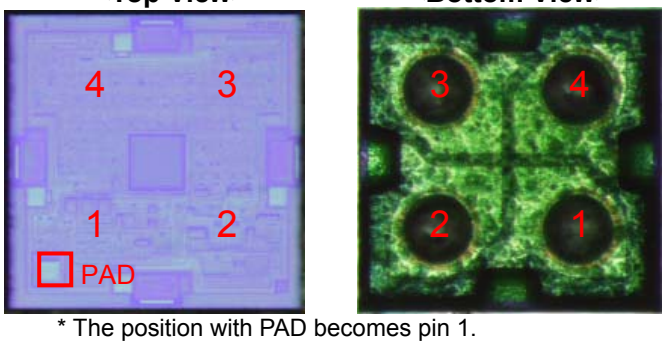


Ball Pitch: 0.5mm, Ball Size: 0.25mm

No.	Name	Function
1	V_{DD}	Supply voltage pin
2	GND	GND pin
3	SCL	I^2C serial clock
4	SDA	I^2C serial data

Pad layout (Photos)

<Top View> <Bottom View>



* The position with PAD becomes pin 1.