



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

LA0152CS — Monolithic Linear IC For Ultra-small illumination Sensor Photo IC

Overview

The LA0152CS is a photo IC for micro-sized illumination sensor which has the characteristics of spectral response similar to that of human eyes. It is suitable for applications like mobile phone, laptop computer, PDA, DSC and Camcorder.

Characteristic

- Smallest OD-CSP package in the world (1.01mm x 1.01mm x thickness: 0.6mm)
- Low variation and Optical Output Current in low temperature fluctuation.
- Integrated 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}		6	V
Operating temperature	T_{opr}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +100	$^\circ\text{C}$

Recommended operating conditions and operating voltage range at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
SW pin low voltage	V_l	Sleep mode	0		0.4	V
SW pin high voltage	V_h	Active mode	1.4		V_{CC}	V

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LA0152CS

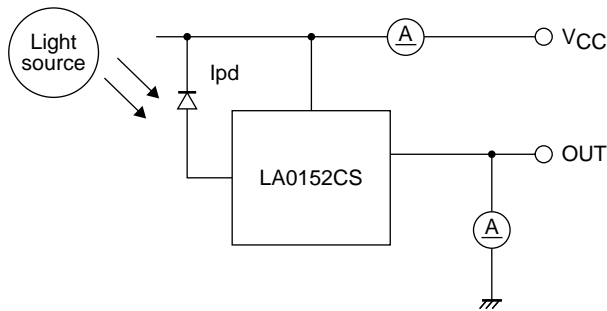
Electrical and optical characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 3.3\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended Supply Voltage	V_{CC}		2.2	3.3	5.5	V
Current dissipation *1, *3	I_{CC}	$E_v = 1000 \text{ lx}$, $R_L = 5\text{k}\Omega$	90	150	210	μA
Sleep Current(1) *3	I_{SL1}	$E_v = 0 \text{ lx}$			0.1	μA
Sleep Current(1) *3	I_{SL2}	$E_v = 1000 \text{ lx}$			0.3	μA
Output current (2) *1, *3	I_{O1}	$E_v = 100 \text{ lx}$	6	8	10	μA
Output current (2) *1, *3	I_{O2}	$E_v = 1000 \text{ lx}$	60	80	100	μA
Dark current *3	I_{leak}	$E_v = 0 \text{ lx}$			0.1	μA
Temperature coefficient *2	I_{tc}	$E_v = 100 \text{ lx}$		0.34		$\%/\text{C}$
Rise time *4	T_r	$E_v = 1000 \text{ lx}$, $R_L = 5\text{k}\Omega$		15	40	μs
Fall time *4	T_f	$E_v = 1000 \text{ lx}$, $R_L = 5\text{k}\Omega$		150	500	μs
Peak sensitivity wave length *2	λ_p			550		nm
Saturation output voltage *1, *3	V_O	$E_v = 1000 \text{ lx}$, $R_L = 150\text{k}\Omega$	3.0	3.2		V

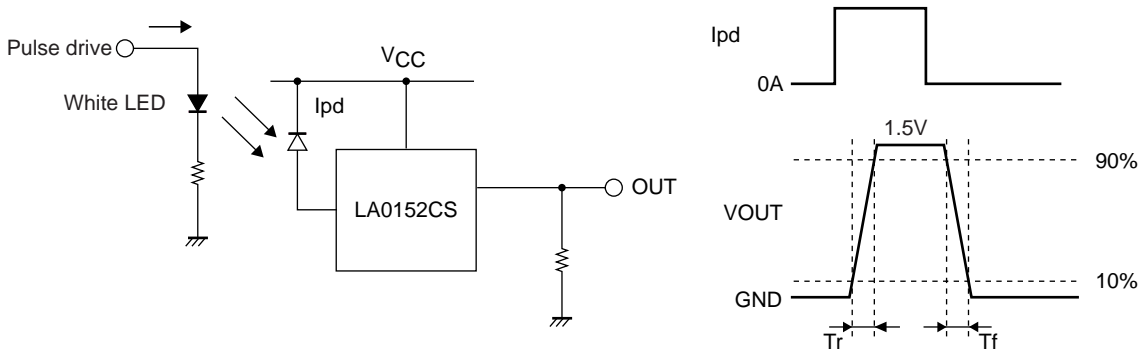
*1. Measured with the standard light source A. White LED is used instead in the mass production line.

*2. Design guaranteed item

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

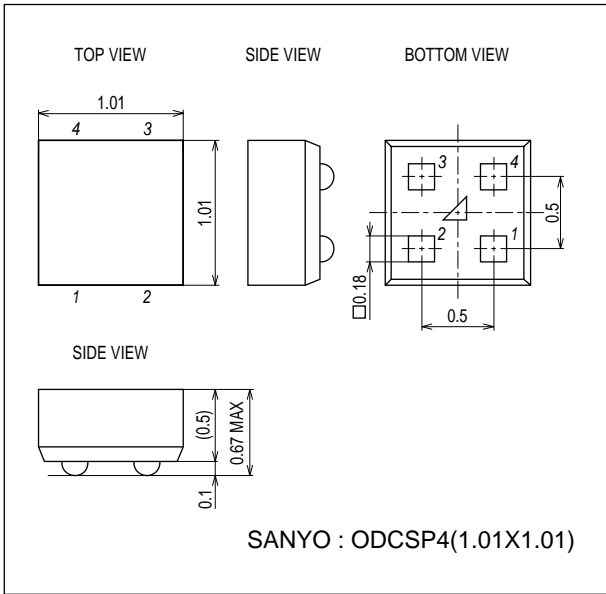


*4. Measuring method of rise time (T_r) and fall time (T_f)

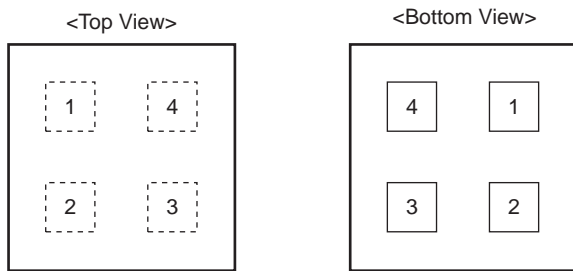


Package Dimensions

unit : mm (typ)
3350A



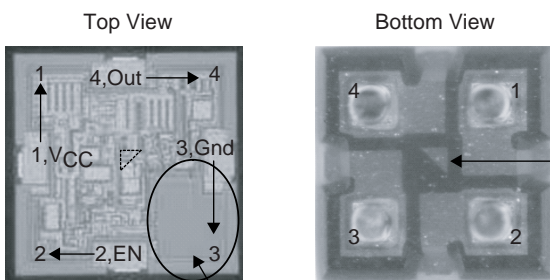
Pad layout



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

Ball pitch : 0.5mm, Ball size : 0.18mm[□]

Pad layout (Photos)



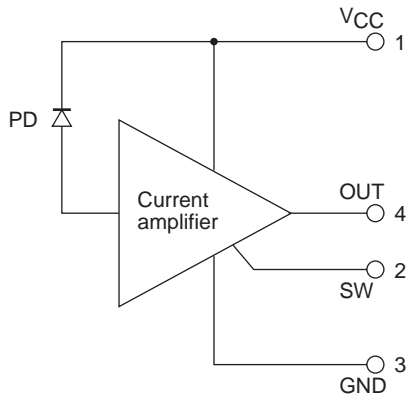
Pin 1 mark
It is located at the center of the bottom of the package.

Photo diode. Only this part looks dark on the product.

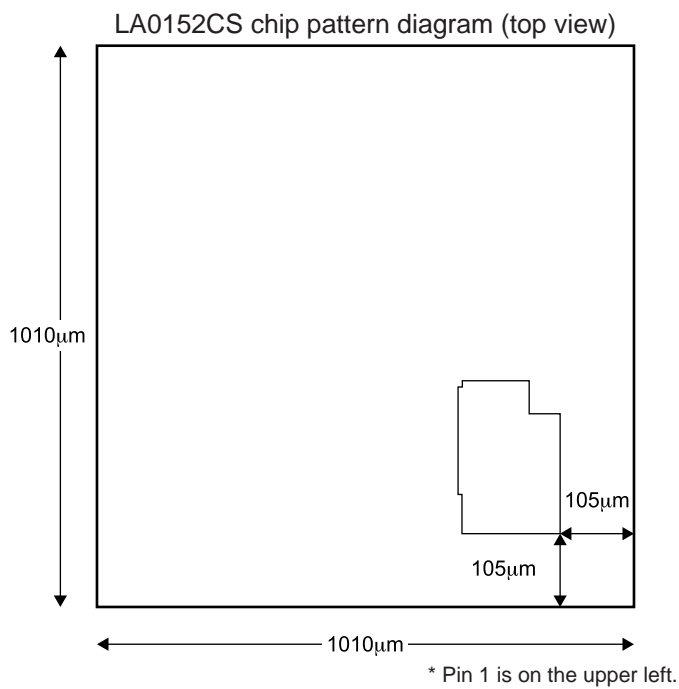
* The photo diode is located in pin 3. Be careful not to mistake the pin 1 mark for the photo diode.

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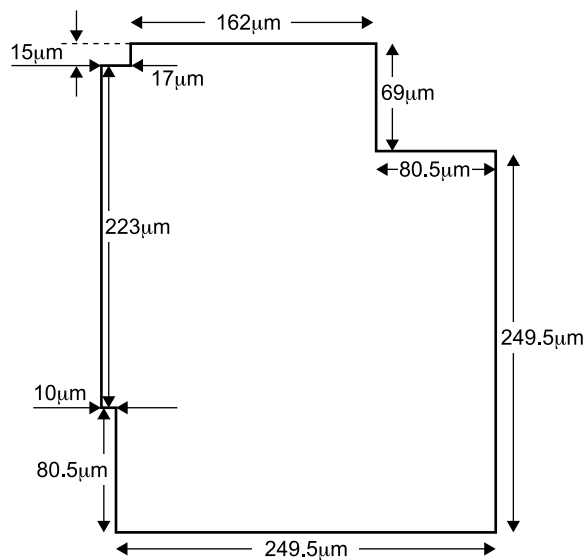
Internal block diagram



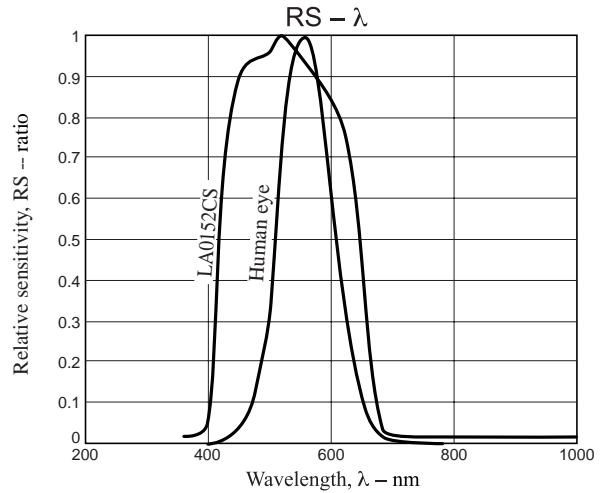
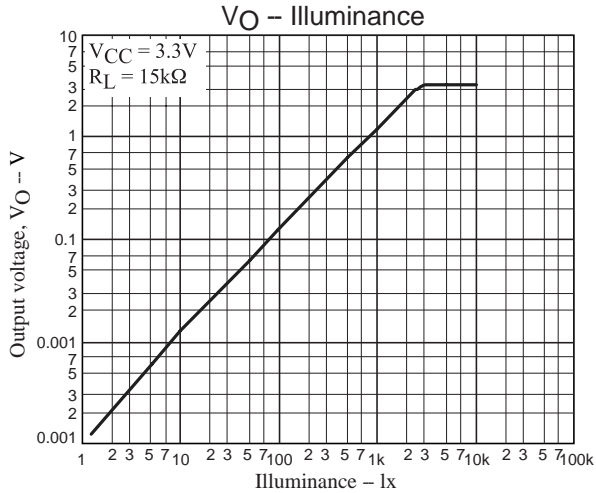
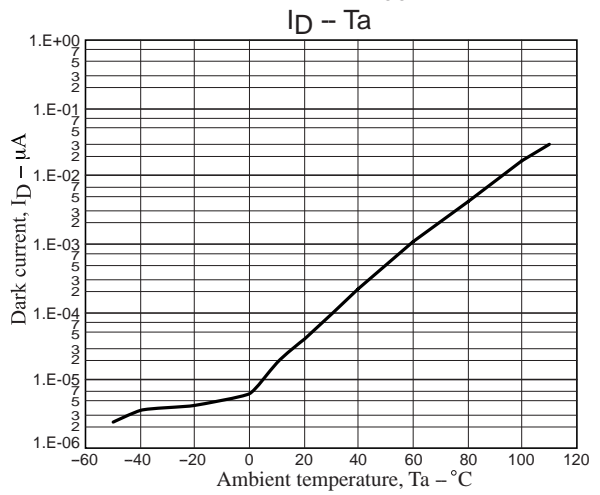
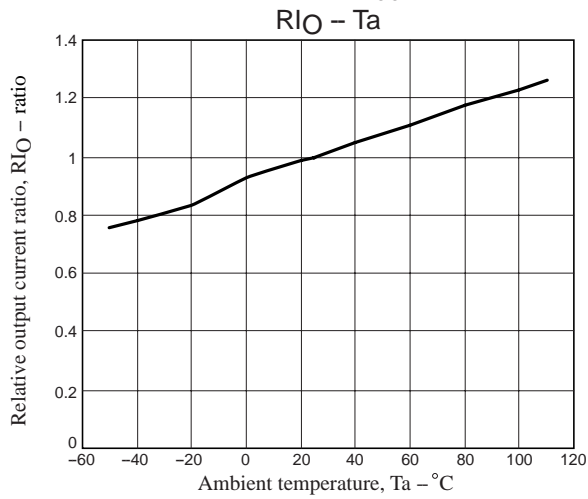
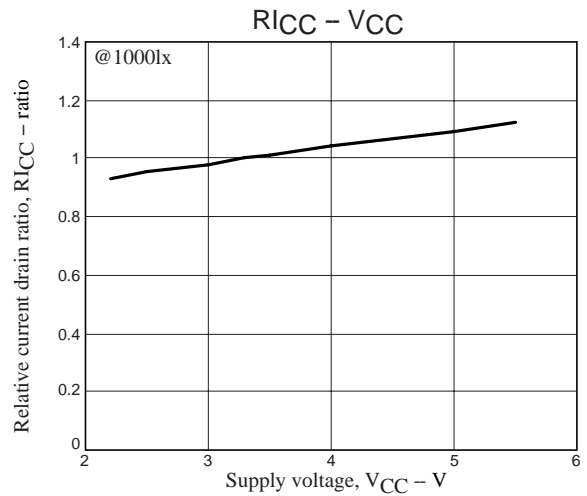
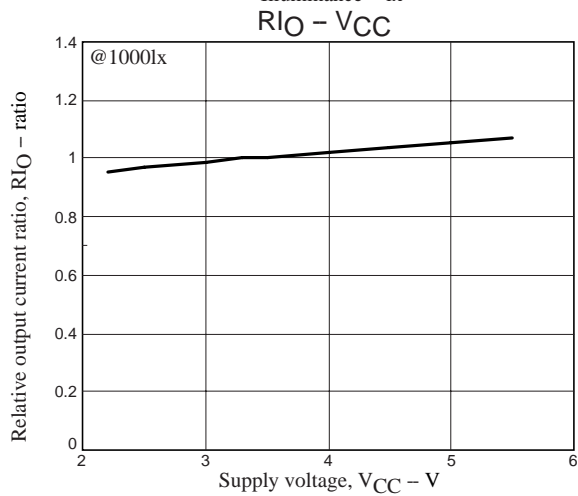
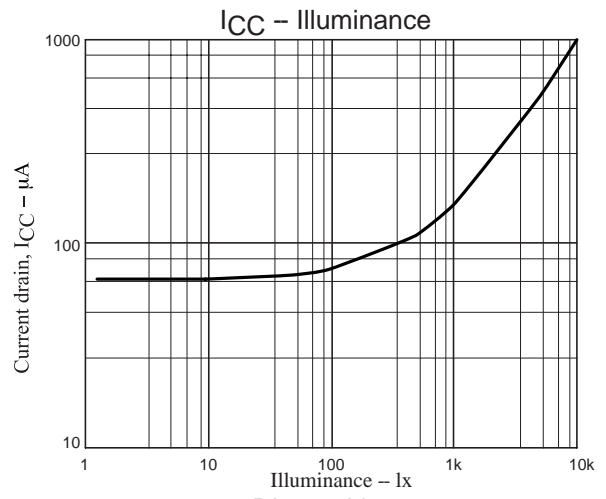
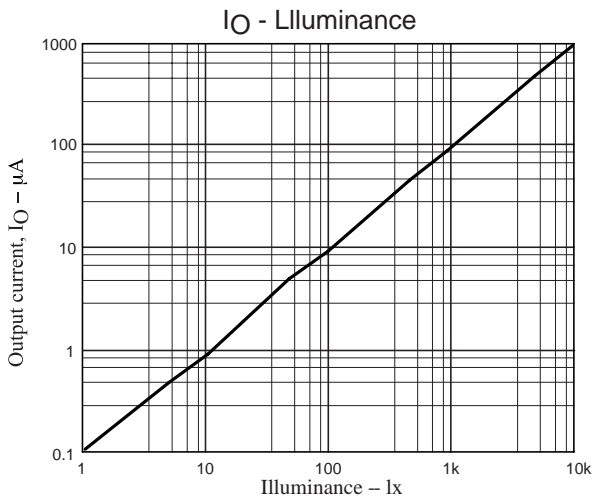
Chip pattern and photo-receiving pattern diagrams

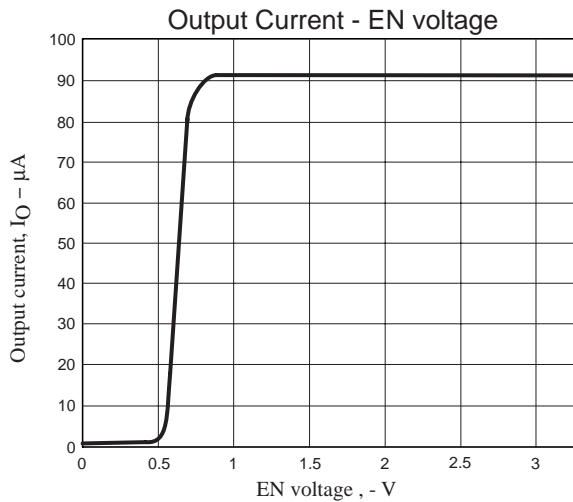
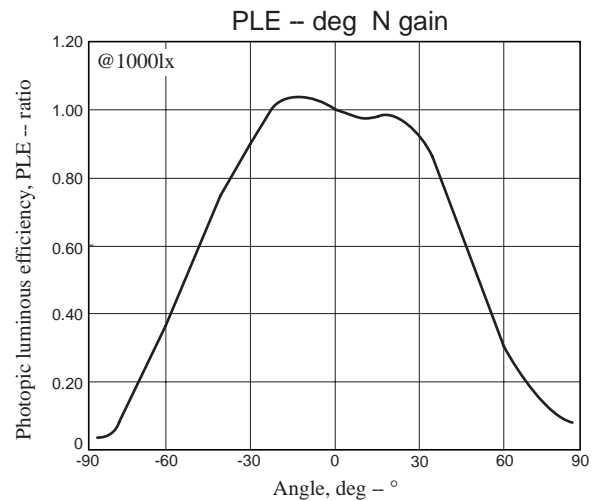
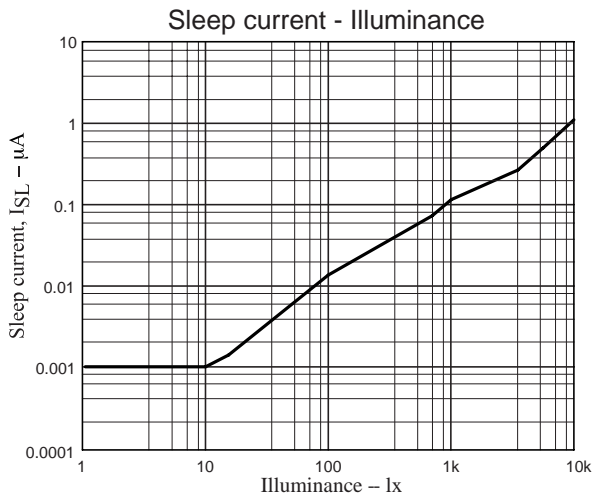


LA0152CS photo-receiving pattern enlarged diagram (effective area)



LA0152CS





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