LA0152CS

Ambient Light Sensor, Linear Current Output, with Standby Function

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www.onsemi.com

Overview

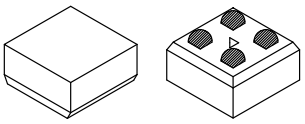
The LA0152CS is a photo IC for ultra-small package ambient light sensor which has the characteristics of spectral response similar to that of human eyes. It is suitable for applications like mobile phone, laptop computer, PDA, DSC and Camcorder.

Features

- 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.

Typical Applications

- Mobile phones and tablets
- Digital still cameras
- Security camera



ODCSP4 1.01 mm x 1.01 mm

ORDERING INFORMATION

Ordering Code:
LA0152CS-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
Maximum supply voltage	V_{CC}		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	
SW pin low voltage	Vl	Sleep mode	0		0.4	V
SW pin high voltage	Vh	Active mode	1.4		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.

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ELECTRICAL AND OPTICAL CHARACTERISTICS at Ta = 25°C, V_{CC} = 3.3V (Note 3)

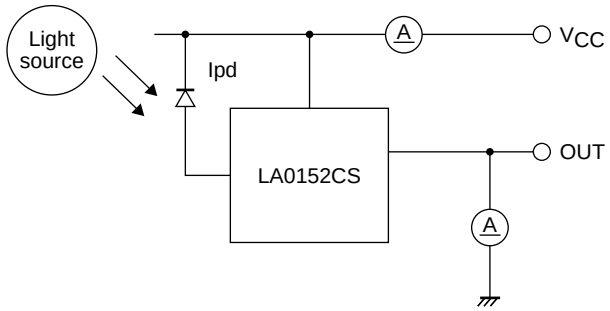
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended Supply Voltage	V_{CC}		2.2	3.3	5.5	V
Current dissipation (Note 4, 6)	I_{CC}	Ev = 1000 lux, R_L = 5kΩ	90	150	210	μA
Sleep Current(1) (Note 6)	$I_{SL}1$	Ev= 0 lux			0.1	μA
Sleep Current(1) (Note 6)	$I_{SL}2$	Ev= 1000 lux			0.3	μA
Output current (2) (Note 4,6)	I_O1	Ev = 100 lx	6	8	10	μA
Output current (2) (Note 4,6)	I_O2	Ev = 1000 lx	60	80	100	μA
Dark current (Note 6)	Ileak	Ev = 0 lx			0.1	μA
Temperature coefficient (Note 5)	Itc	Ev = 100 lx		0.34		%/°C
Rise time (Note 7)	Tr	Ev = 1000 lx, R_L = 5kΩ		15	40	μs
Fall time (Note 7)	Tf	Ev = 1000 lx, R_L = 5kΩ		150	500	μs
Peak sensitivity wave length (Note 5)	λp			550		nm
Saturation output voltage (Note 4,6)	V_O	Ev = 1000 lx, R_L = 150kΩ	3.0	3.2		V

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.

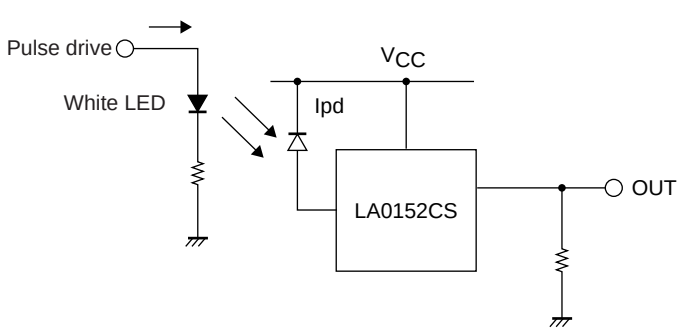
4. Measured with the standard light source A. White LED is used instead in the mass production line.

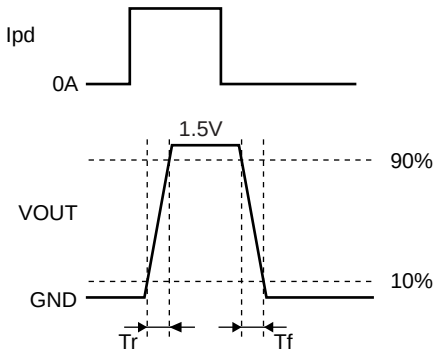
5. Design guaranteed item

6. Test circuit for measuring current dissipation and output current

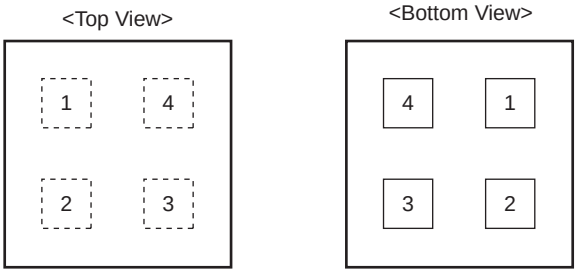


7. Measuring method of rise time (Tr) and fall time (Tf)





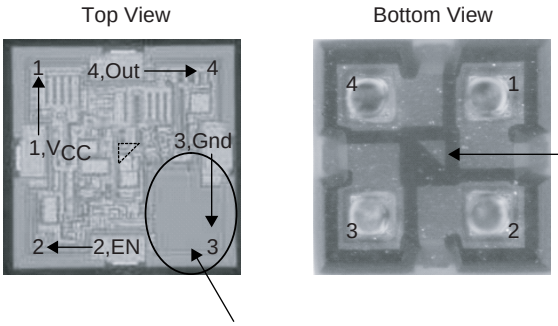
PAD LAYOUT



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 : 0.18mm □

PAD LAYOUT (Photos)

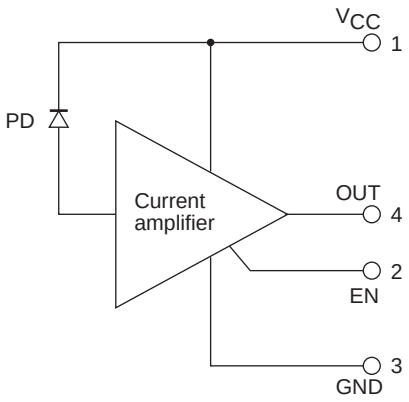


Pin 1 mark
It is located at the center of the bottom of the pakage.

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

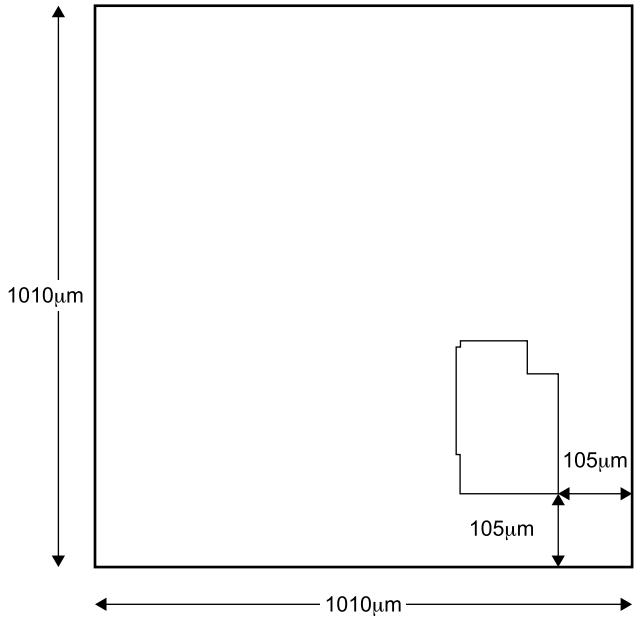
* The photo diode is located in pin 3. Be careful not to mistake the pin 1 mark for the photo diode.

INTRNAL BLOCK DIAGRAM



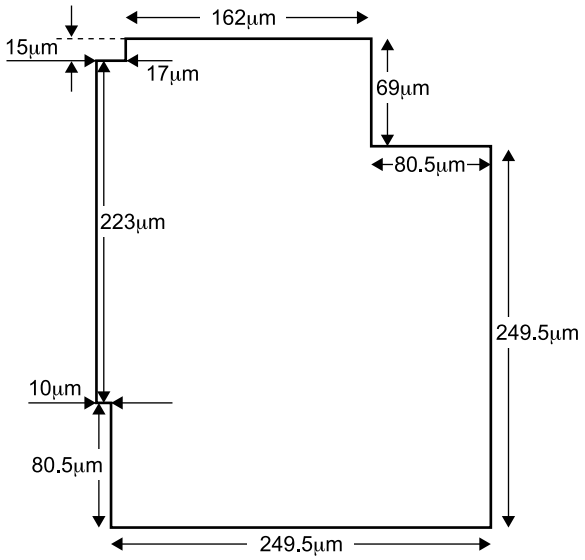
CHIP PATTERN AND PHOTO-RECEIVING PATTERN DIAGRAMS

LA0152CS chip pattern diagram (top view)

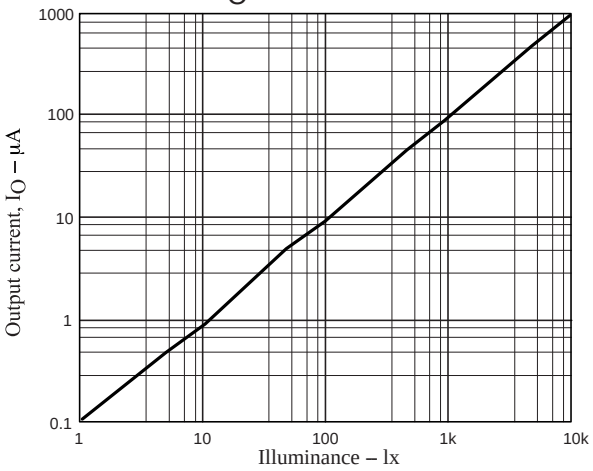


* Pin 1 is on the upper left.

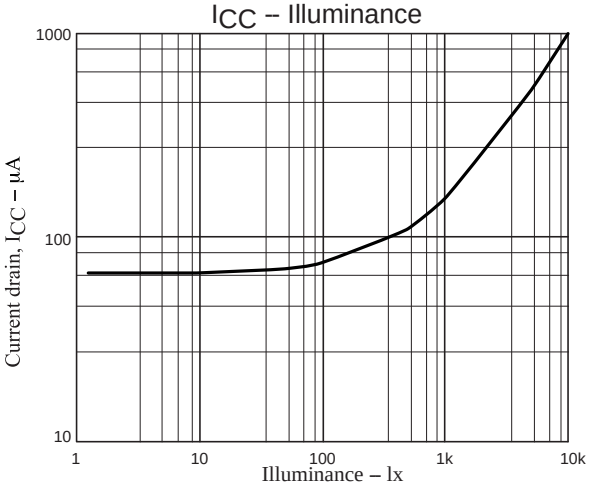
LA0152CS photo-receiving pattern enlarged diagram (effective area)



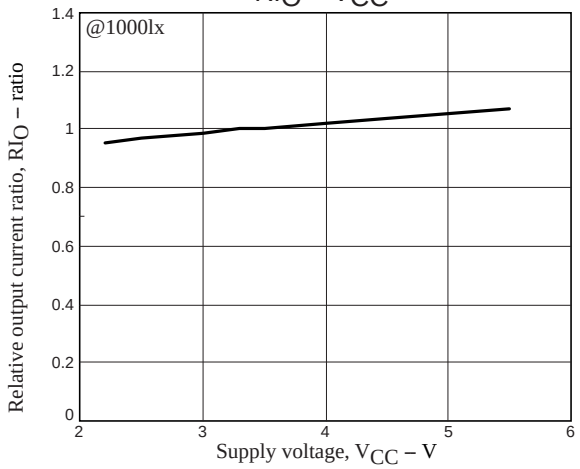
I_O - LIluminance



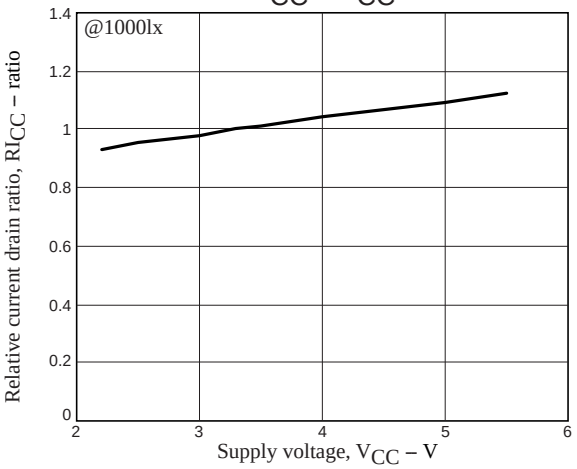
I_{CC} – Illuminance



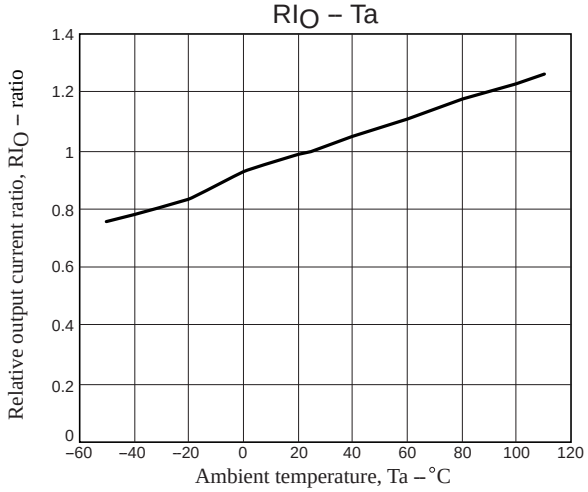
RI_O – V_{CC}



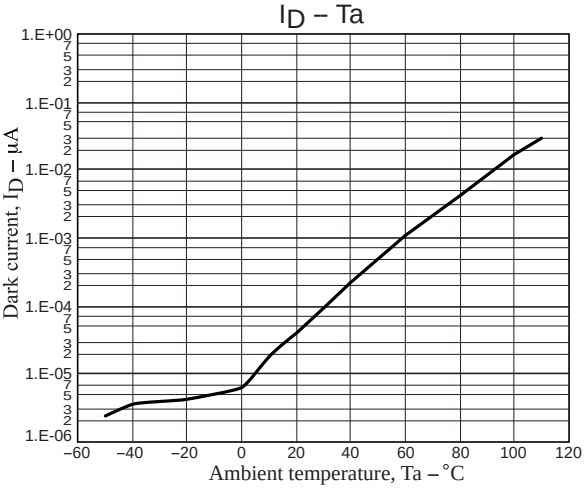
RI_{CC} – V_{CC}



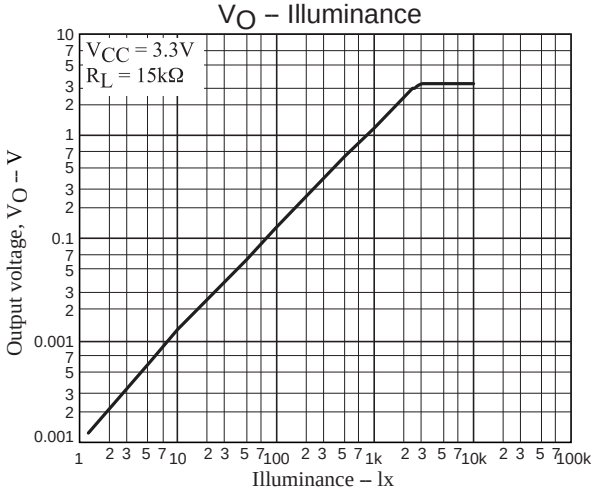
RI_O – Ta



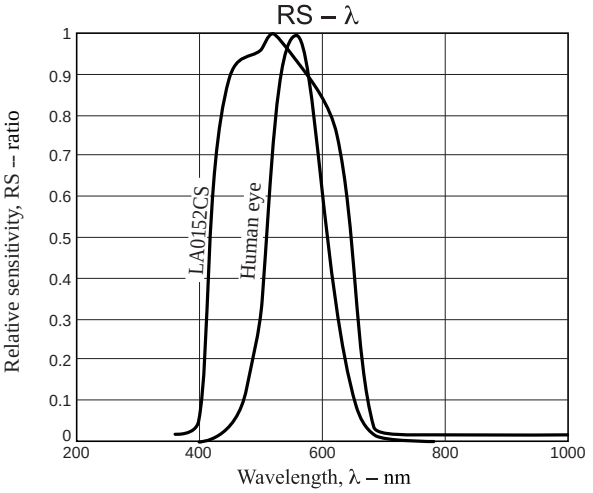
I_D – Ta



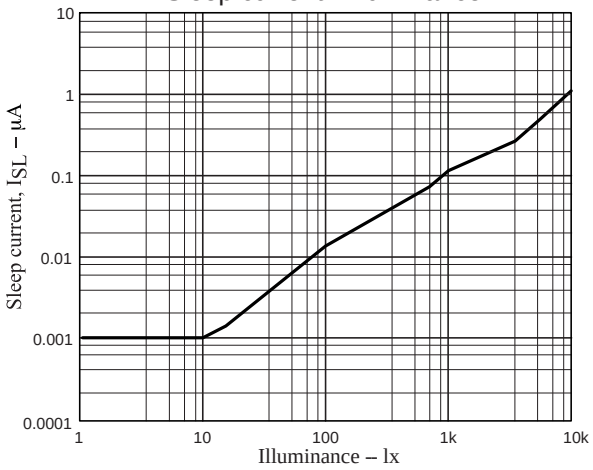
V_O – Illuminance



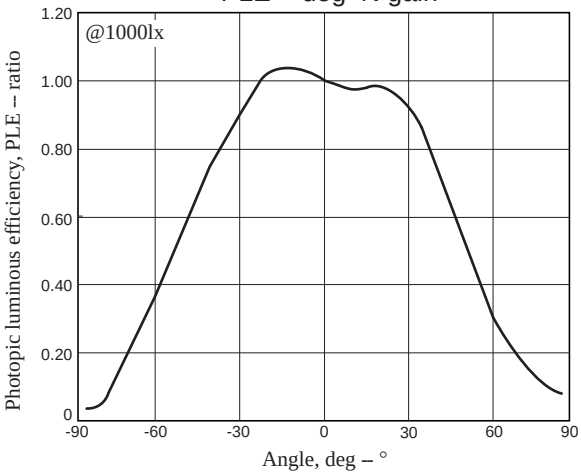
RS – λ



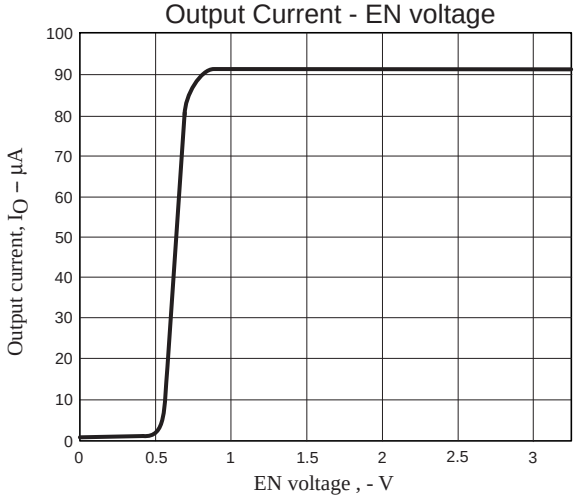
Sleep current - Illuminance



PLE -- deg N gain



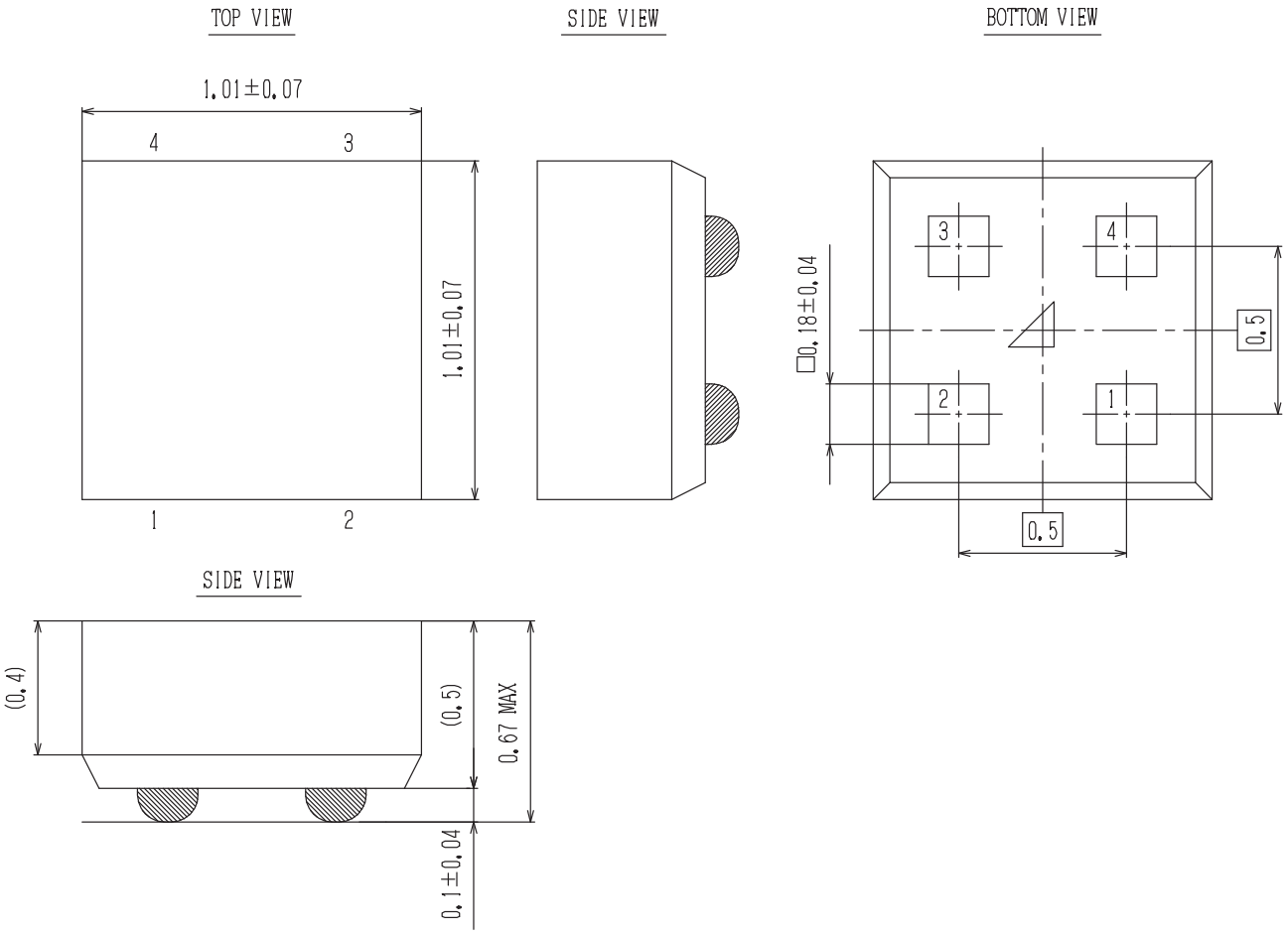
Output Current - EN voltage



PACKAGE DIMENSIONS

unit : mm

ODCSP4 1.01x1.01
CASE 570AC
ISSUE O



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