HAMAMATSU

PHOTON IS OUR BUSINESS

Photo IC for encoder



S4506

Photo IC for photointerrupters with encoder functions

The S4506 incorporates a 4-element photodiode array that provides 2-phase digital output in response to the input light status. Photointerrupters with encoder functions can be easily configured by using the S4506.

Features

Applications

- 2-phase (phases A and B) digital output
- Integrated with 4-element photodiode (pitch: 0.39 mm)
- **Direct TTL connection**
- Miniature plastic package

■ Encoders for office machine, robots, and NC machines

→ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	-0.5 to +7	V
Output current	Io	20	mA
Power dissipation*1	Po	250	mW
Operating temperature	Topr	-30 to +80	°C
Storage temperature	Tstg	-40 to +85	°C
Soldering	-	230 °C, 5 s, at least 1.8 mm away from package surface	-

^{*1:} Power dissipation decreases at a rate of 3.3 mW/°C above Ta=25 °C

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

■ Electrical and optical characteristics (Ta =25 °C, Vcc=5 V, unless otherwise noted)

Parameter		Symbol	Condition	Min.	Тур.	Max.	Unit
Supply voltage		Vcc		4.5	-	5.5	V
Low level output voltage		Vol	IoL=8 mA	-	0.1	0.4	V
High level output voltage		Vон	IOH=0 mA	4.5	-	-	V
Current consumption		ICCL	VOA=VOB="L"	-	6	12	mA
		ICCH	VOA=VOB="H"	-	3	12	mA
Peak sensitivity wavelength		λр		-	870	-	nm
Slit movement speed		Vp	Ev=200 lx*2 *3	-	-	10,000	slit/s
Transfer characteristics	Duty ratio*4	DA	Ev=200 lx*2	35	50	65	%
		Dв	f=2.5 kHz				
	Phase difference	θав	f=2.5 kHz, Ev=200 to 700 lx^{*2}	60	90	120	deg
	Threshold illuminance*5	Evd	"A" light source, f=2.5 kHz	-	30	120	lx

^{*2:} Ev is illuminance emitted from a CIE standard "A" light source (tungsten lamp).

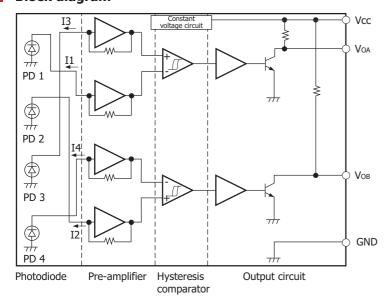
^{*3:} A collimated light source and a recommended slit moving at a constant speed are used.

[Delay time between the instant that the slit passes through the output transition position and the actual output transition should be less than 1/8 of the slit cycle.]

^{*4:} See operation timing diagram (page 4)

^{*5:} Minimum illuminance from an "A" light source when the duty ratio of phases A and B is between 35 and 65%.

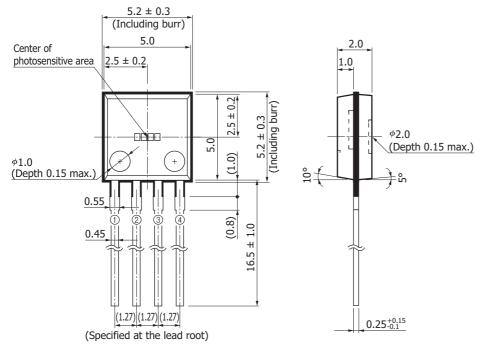
- Block diagram

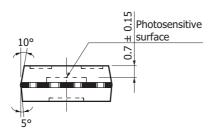


TA1	DUT	OUTPUT		
IN	PUT	Voa	Vов	
I ₁ < I ₃	I ₂ > I ₄	L	L	
I ₁ < I ₃	I ₂ < I ₄	L	Н	
$I_1 > I_3$	I ₂ > I ₄	Н	L	
$I_1 > I_3$	$I_2 < I_4$	Н	Н	

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Dimensional outline (unit: mm)



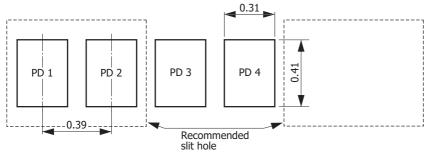


- ① VOA
- ② Vcc
- ③ GND
- 4 Vob

Tolerance unless otherwise noted: ± 0.1 , $\pm 2^{\circ}$ Shaded area indicates burr. Values in parentheses are not guaranteed, but for reference

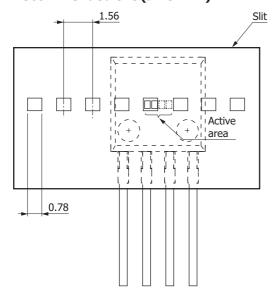
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Details of photodiodes (unit: mm)



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- Recommended slit (unit: mm)

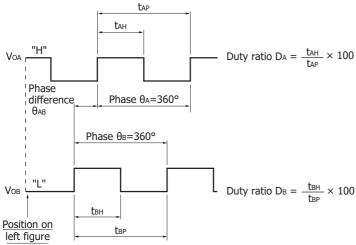


Light source: Collimated light LED

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- Operation timing diagram

Outputs VOA and VOB change as shown when the slit is moved to the right at a constant speed from the position shown on the left figure.



KPICC0015ED

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Related information

www.hamamatsu.com/sp/ssd/doc en.html

- Precautions
- Disclaimer
- · Metal, ceramic, plastic products

Information described in this material is current as of October 2017.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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