

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

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

Applications

- 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.	Typ.	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	VOH	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	λp		-	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	%
		DB	f=2.5 kHz				
	Phase difference	θAB	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).

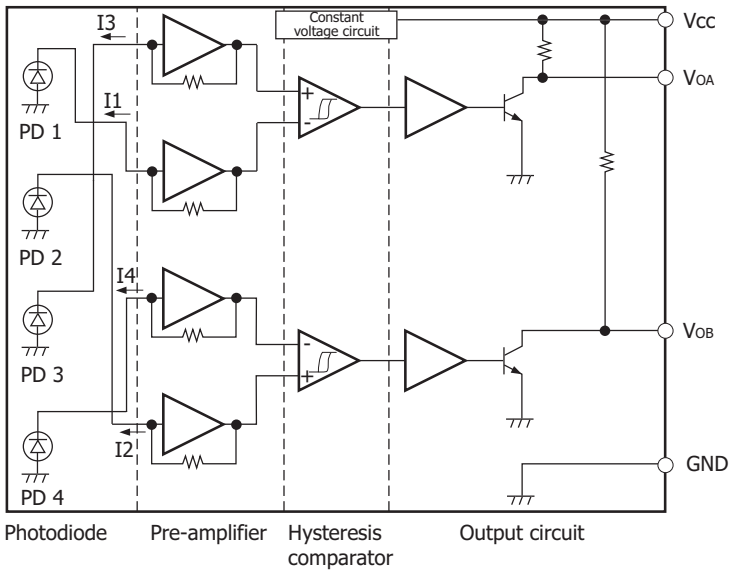
*3: A collimated light source and a recommended slit moving at a constant speed are used.

[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%.

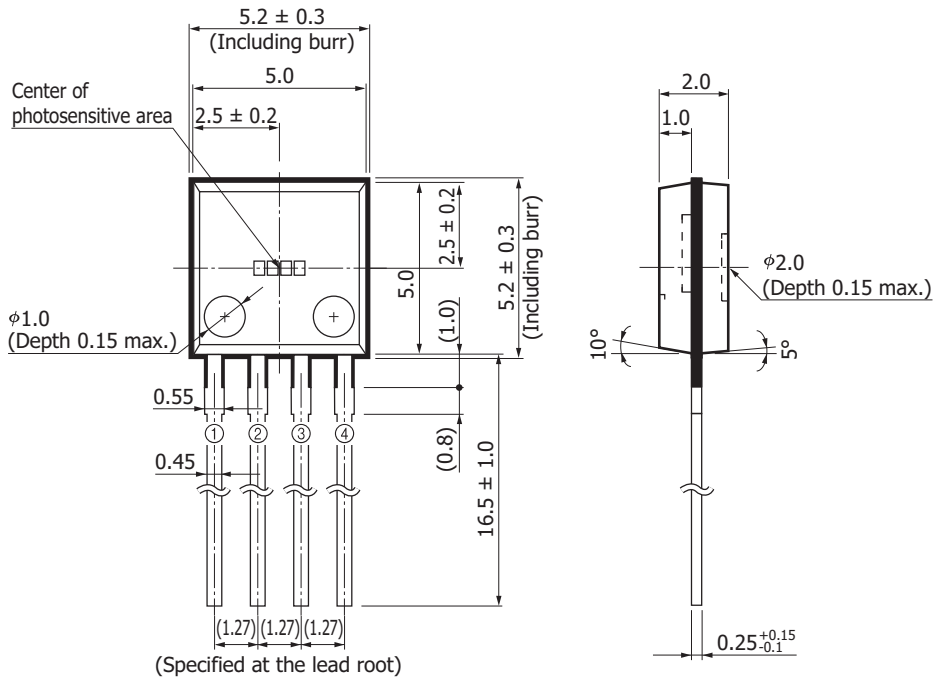
Block diagram



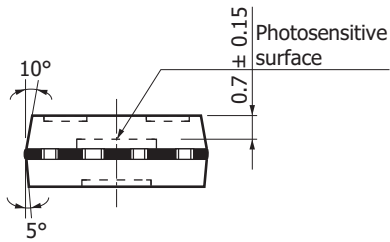
INPUT		OUTPUT	
		V _{OA}	V _{OB}
$I_1 < I_3$	$I_2 > I_4$	L	L
$I_1 < I_3$	$I_2 < I_4$	L	H
$I_1 > I_3$	$I_2 > I_4$	H	L
$I_1 > I_3$	$I_2 < I_4$	H	H

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Dimensional outline (unit: mm)



(Specified at the lead root)

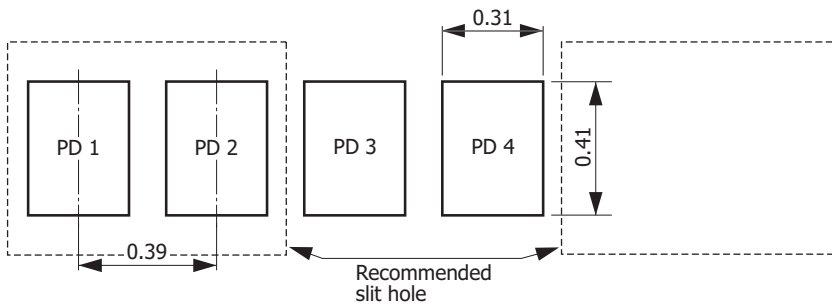


- ① V_{OA}
- ② V_{CC}
- ③ GND
- ④ V_{OB}

Tolerance unless otherwise noted: ±0.1, ±2°
 Shaded area indicates burr.
 Values in parentheses are not guaranteed, but for reference

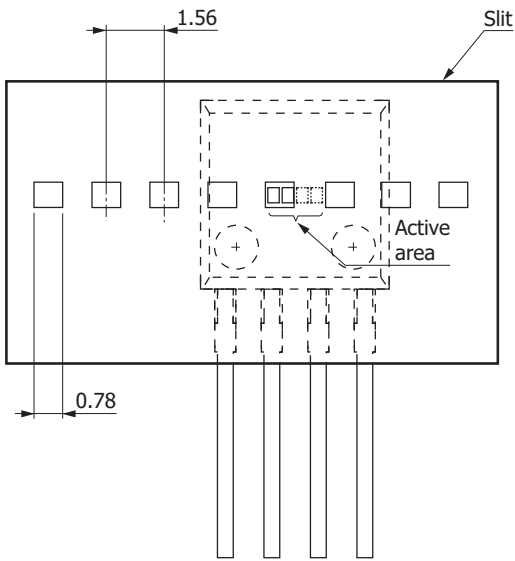
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Details of photodiodes (unit: mm)



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Recommended slit (unit: mm)

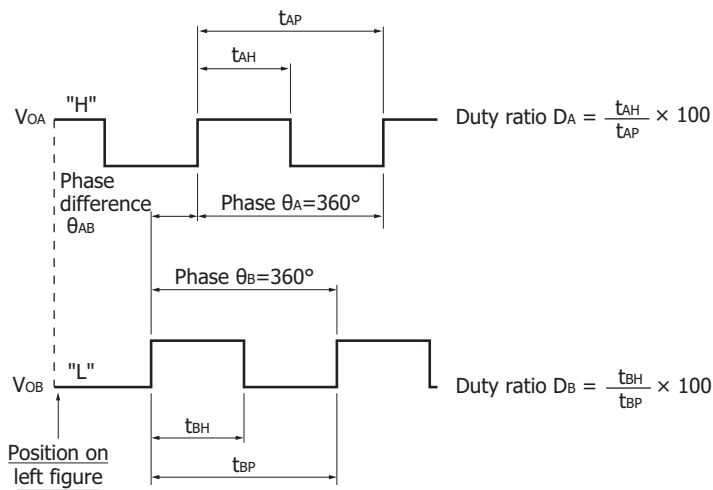


Light source: Collimated light LED

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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.



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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.

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