

Photo IC for laser beam synchronous detection

S6174, S6874-10, S8041

Photo IC for start timing detection for laser printers, etc.



S6174, S6874-10, S8041 are designed for laser beam synchronous detection in laser printers, etc. These photo ICs use a single-element photodiode and a signal processing circuit integrated in a small package. For more precision printing, Hamamatsu also provides S5049 series photo ICs using a dual-element photodiode.

Features

- Small plastic package: 4.5 × 5.5 mm (S6174, S6874-10)
- Built-in signal processing circuit
- Photodiode length
 - S6174 : 1.65 mm
 - S6174-10: 2.17 mm
 - S8041 : 3.0 mm

Applications

- Print start timing detection for laser printers, digital copiers, etc.

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	S6174	S6874-10	S8041	Unit
Supply voltage	Vcc		-0.5 to +7		V
Power dissipation *1	P		150		mW
Output voltage	Vo		-0.5 to Vcc		V
Output current	Io		20		mA
Ro terminal current	IRO		2		mA
Operating temperature	Topr		-25 to +80		°C
Storage temperature	Tstg		-40 to +85		°C
Soldering	-		230 °C, 5 s		-

*1: Derate power dissipation at a rate of 2 mW/°C above Ta=25 °C.

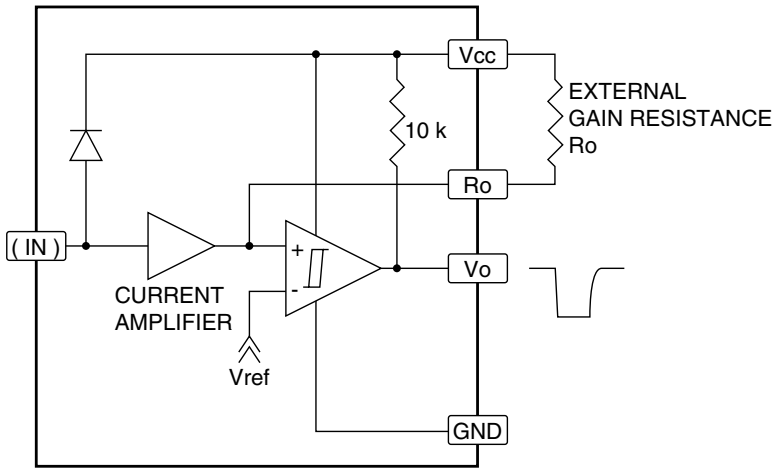
■ Electrical and optical characteristics (Ta=25 °C, λ=780 nm, Vcc=Vcc1=Vcc2=5 V, Ro=5.1 kΩ, unless otherwise noted)

Parameter	Symbol	Condition	S6174			S6874-10			S8041			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Supply voltage	Vcc		4.5	5.0	5.5	4.5	5.0	5.5	4.5	5.0	5.5	V
High level output voltage	VOH	Pin=0	4.9	-	-	4.9	-	-	4.9	-	-	V
Low level output voltage	VOL	Pin=200 μW, IoL=10 mA	-	0.4	0.6	-	0.4	0.6	-	0.4	0.6	V
Current consumption	ICC	Pin=0, at high level output	-	-	5	-	-	5	-	-	5	mA
		Pin=200 μW	-	-	6	-	-	6	-	-	6	mA
Threshold input power	PTH		55	70	85	55	70	85	60	75	90	μW
H→L propagation delay time	tPHL	Pin=200 μW Duty ratio 1: 1 RL=510 Ω, CL=15 pF *2	-	-	400	-	-	400	-	-	400	ns
L→H propagation delay time	tPLH		-	-	600	-	-	600	-	-	600	
Rise time	tr		-	-	200	-	-	200	-	-	200	
Fall time	tf		-	-	100	-	-	100	-	-	100	

*2: Measured by pulse-driving a laser diode. Rise time (tr) and fall time (tf) of input light waveform are less than 1 ns.

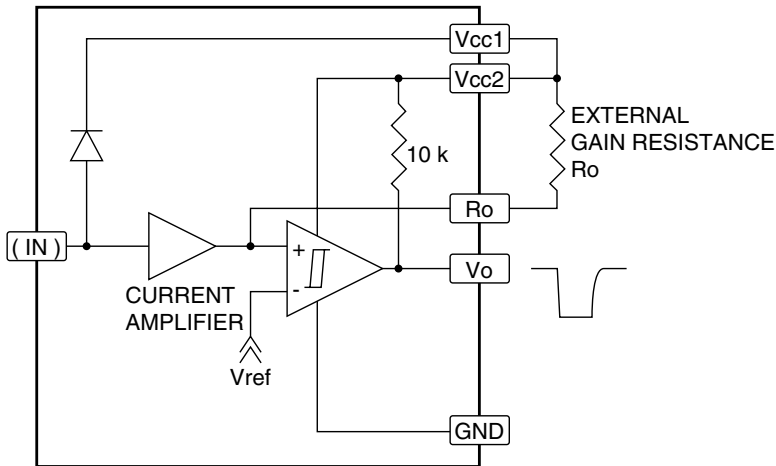
■ Block diagram

S6174, S6874-10



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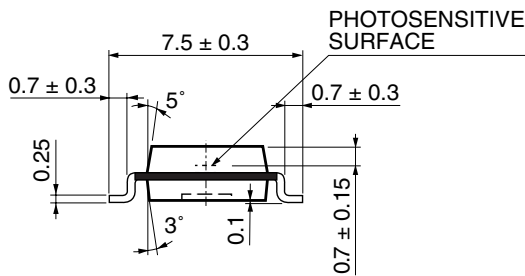
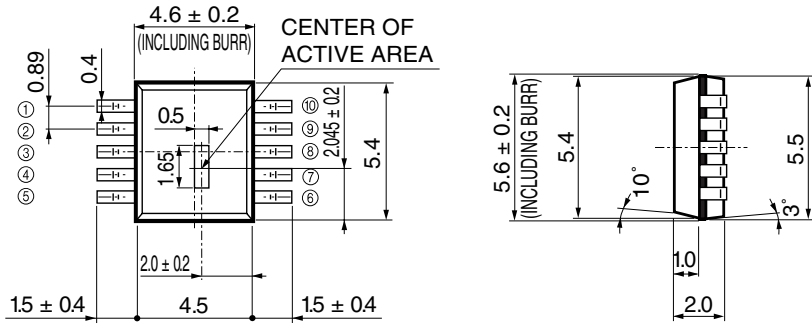
S8041



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■ Dimensional outlines (unit: mm)

S6174

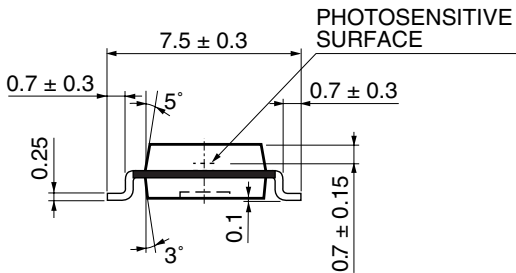
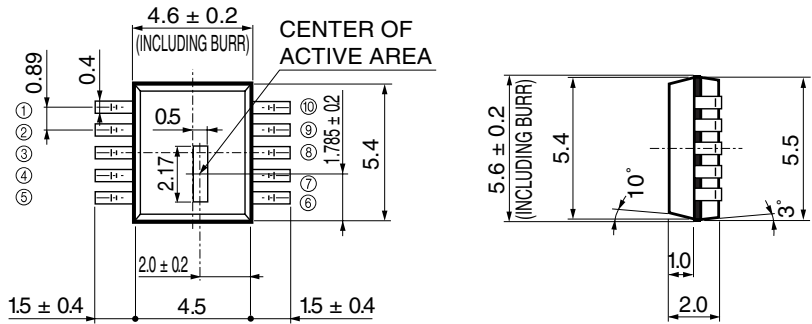


- ① Vo ⑥ NC
- ② Ro ⑦ NC
- ③ Vcc ⑧ NC
- ④ NC ⑨ (IN)
- ⑤ NC ⑩ GND

Tolerance unless otherwise noted: ± 0.1 , $\pm 2^\circ$
Shaded area indicates burr.

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S6874-10

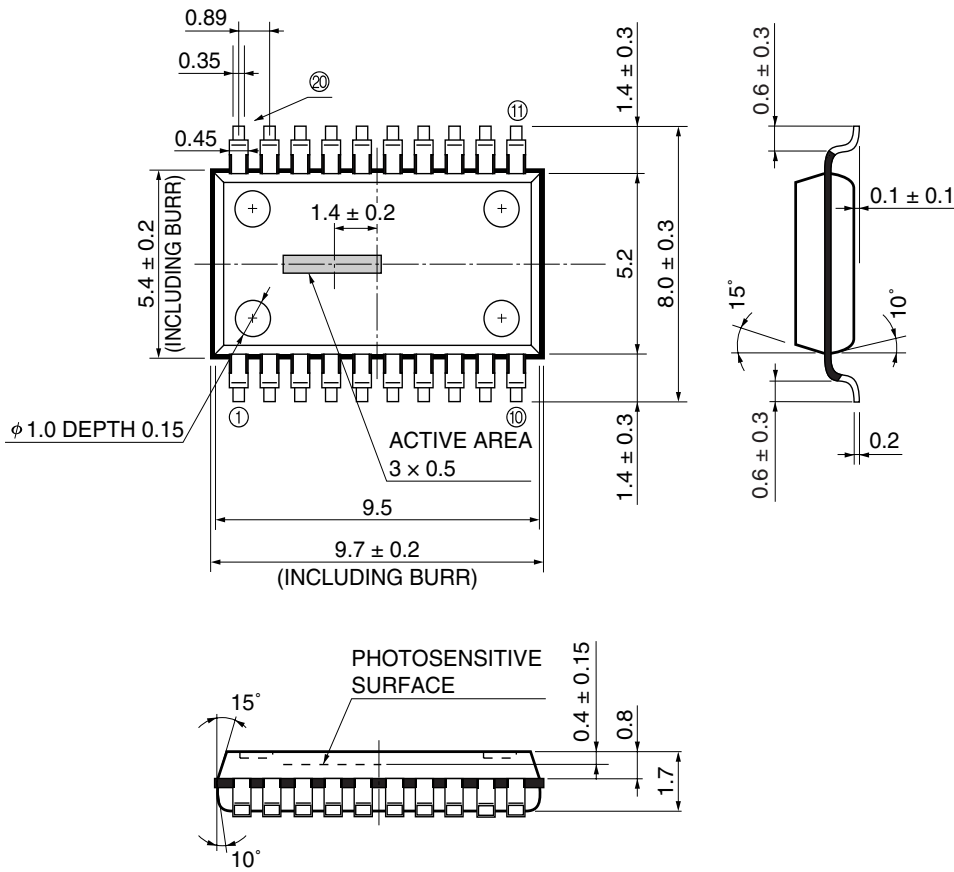


- ① Vo ⑥ NC
- ② Ro ⑦ NC
- ③ Vcc ⑧ NC
- ④ NC ⑨ (IN)
- ⑤ NC ⑩ GND

Tolerance unless otherwise noted: ± 0.1 , $\pm 2^\circ$
Shaded area indicates burr.

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S8041



①		⑪	Vo
②		⑫	(GND)
③	Vcc1	⑬	Ro
④		⑭	Vcc2
⑤		⑮	Vcc1
⑥		⑯	
⑦	⑰	IN (PD)	
⑧	⑱	(GND)	
⑨	(GND)	⑲	
⑩	GND	⑳	

Tolerance unless otherwise noted: ± 0.1 , $\pm 2^\circ$
 Shaded area indicates burr.
 Pins ⑧, ⑨ and ⑫ should be connected to pin ⑩ on the PC board.

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