

Photo IC for laser beam synchronous detection

S5049-103

Photo IC for start timing detection for precise printing



S5049-103 uses a dual-element PIN photodiode and compares the two photocurrent signals to maintain a highly stable output even when input laser power or ambient temperature fluctuates.

Features

- Photo IC for precision printing
Stable output versus laser power or temperature variations
- For detection of low power laser beams
- Photodiode length: 2.4 mm

Applications

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

■ Absolute maximum ratings (Ta=25 °C, Vcc1=Vcc2=Vcc)

Parameter	Symbol	Value	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
Ro1, Ro2 terminal current	IRO	5	mA
Operating temperature	Topr	-25 to +80	°C
Storage temperature	Tstg	-40 to +85	°C
Soldering	-	230 °C, 5 s	-

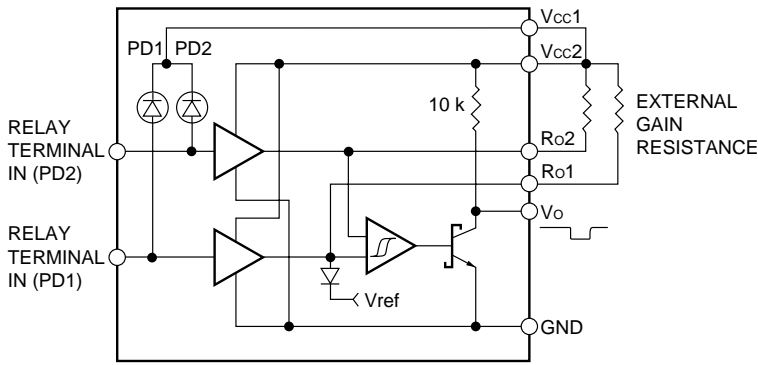
*1: Derate power dissipation at a rate of 2 mW/°C above Ta=25 °C.

■ Electrical and optical characteristics (Ta=25 °C, λ=780 nm, Vcc1=Vcc2=Vcc=5 V, Ro1=Ro2=5.1 kΩ, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Vcc		4.5	5.0	5.5	V
High level output voltage	VOH	Pin=0	4.9	-	-	V
Low level output voltage	VOL	Pin=200 μW, IoL=10 mA	-	0.4	0.6	V
Current consumption	Icc	Pin=0, at high level output	-	6.0	8.0	mA
		Pin=200 μW, at low level output	-	8.0	11.0	mA
Threshold input power	PTH		25	35	45	μW
H→L propagation delay time variation	ΔtPHL	Pin=200 μW at center ΔPin=±10 % *2 RL=510 Ω, CL=15 pF	-	-	±6	ns
L→H propagation delay time variation	ΔtPLH		-	±50	-	ns
Rise time	tr		-	60	180	ns
Fall time	tf		-	20	100	ns

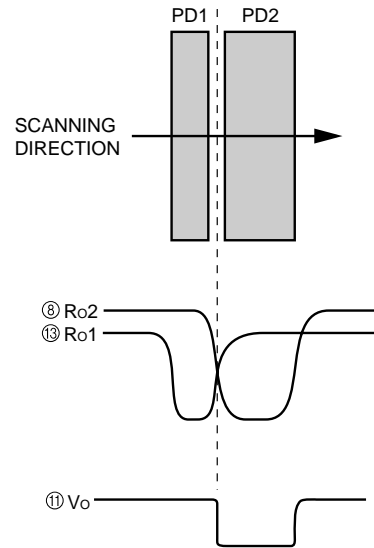
*2: Beam diameter ϕ ($1/e^2$) = 100 μm, scan speed=0.5 mm/μs
Not including jitter caused by polygon mirror non-uniformity, etc.

■ Equivalent circuit



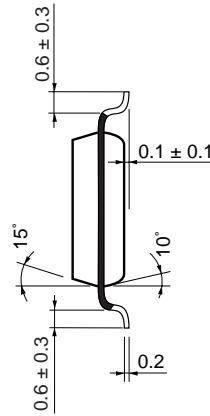
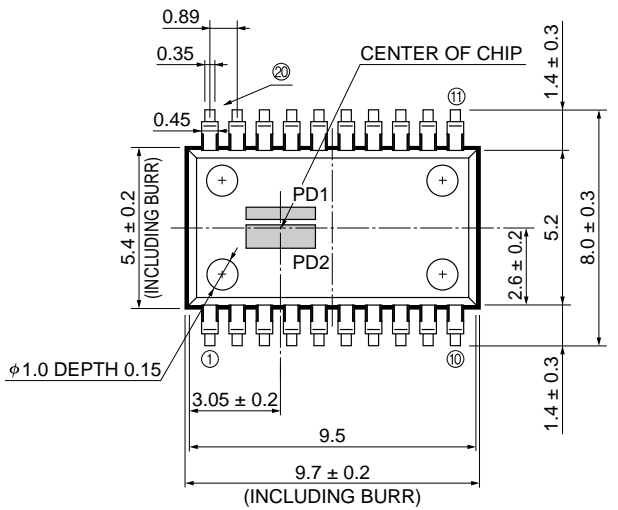
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■ Output waveforms of terminals 8, 11 and 13

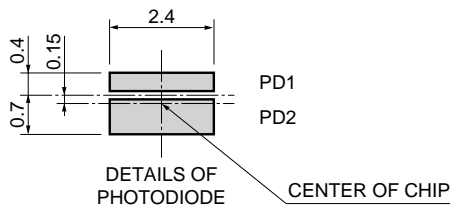
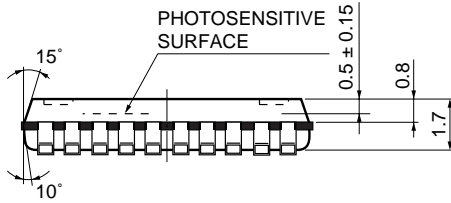


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■ Dimensional outline (unit: mm)



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



Tolerance unless otherwise noted: ± 0.03

①	Vcc1
②	Vcc1
③	Vcc1
④	Vcc1
⑤	Vcc1
⑥	[IN (PD2)]
⑦	GND
⑧	Ro2
⑨	GND
⑩	GND
⑪	Vo
⑫	GND
⑬	Ro1
⑭	Vcc2
⑮	[IN (PD1)]
⑯	Vcc1
⑰	Vcc1
⑱	Vcc1
⑳	Vcc1

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