

Photo IC for rangefinder S8030, S8064

Photo IC designed for near/far distance detection



S8030 and S8064 are light modulation photo ICs consisting of a dual photodiode and a control/processing circuit. When used with an infrared LED and light emitting/receiving lenses, these photo ICs detect the distance (near or far) to an object at a certain measurement cycle by utilizing the optical triangular distance measurement.

Features

- Detects distance (near/far) to object
- Photodiode, LED drive circuit and signal processing circuit are all integrated.
- Open collector output
- Visible light cut package impervious to disturbance background light
- Subminiature plastic package

Applications

- Optical switch

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	S8030	S8064	Unit
Supply voltage	Vcc	-0.5 to +7.0		V
Output voltage	Vo	-0.5 to +7.0		V
Output current	Io	50		mA
LED terminal voltage	VLED	-0.5 to +7.0		V
LED terminal current	ILED	70		mA
Power dissipation	P	250 *		mW
Operating temperature	Topr	-20 to +70		°C
Storage temperature	Tstg	-30 to +80		°C
Soldering	-	230 °C, 5 s	230 °C, 5 s, at least 1.8 mm away from package surface	-

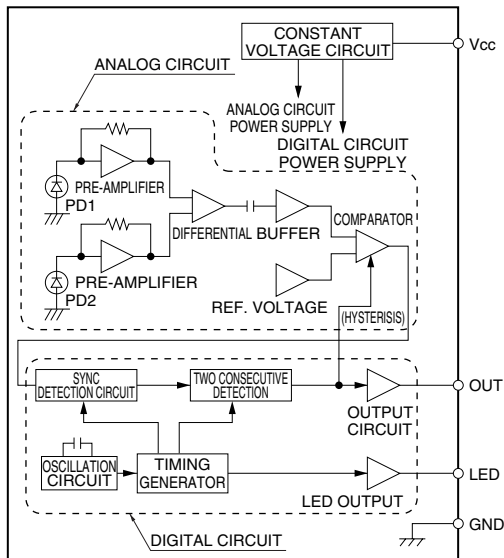
* Derate power dissipation at a rate of 3.3 mW/°C above Ta=25 °C

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	λ_p		-	850	-	nm
Photo sensitivity	S	$\lambda=900$ nm	-	0.3	-	A/W
Operation supply voltage	Vcc		4.5	5	6	V
Current consumption	Icc		-	4	6	mA
High level LED output current	ILEDH	VLED=5 V	-	-	1	μ A
Low level LED output voltage	VLEDL	Sink 10 mA	-	0.2	0.4	V
Low level LED pulse width	Tw		4.6	7	10.5	μ s
LED pulse cycle	Tp		150	224	336	μ s
Threshold input difference current	ITH	No background light	2.5	5	10	nA
Allowable background light	Ex	"A" light source 500 lx or less between channels	3000	-	-	lx
High level output current	IOH	VOUT=5 V	-	-	1	μ A
Low level output voltage	VOL	Sink 10 mA	-	0.2	0.4	V

Note) A bypass capacitor (0.1 μ F) should be connected between Vcc and GND at a position within 7 mm from the photo IC lead. Another capacitor (4.7 μ F) should also be connected nearby between Vcc and GND.

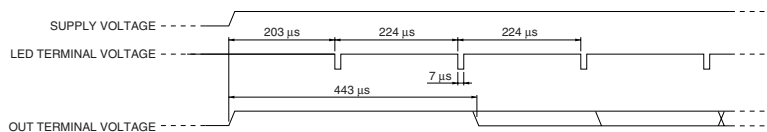
■ Block diagram



NOTE) TERMINAL AND POLARITY
 LED: NPN open collector output is ON when LED is driven.
 OUT: NPN open collector output is ON when near distance is detected.

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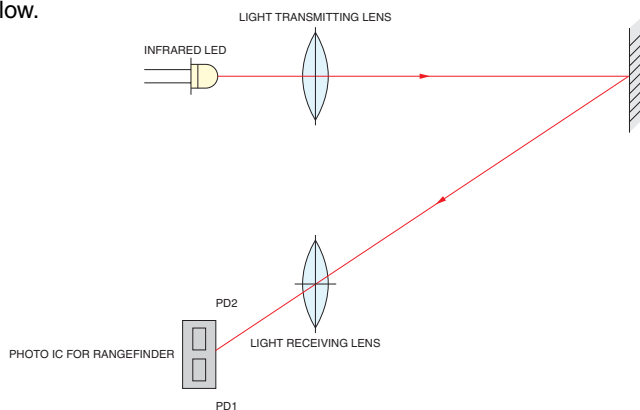
■ Timing chart: two consecutive measurements



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■ Functions and optical systems

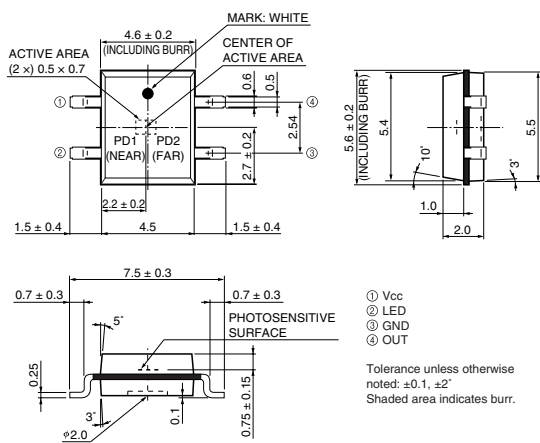
S8030 and S8064 photo ICs incorporate a dual photodiode (0.7×0.5 mm active area per channel) and a control/detection circuit. When used with an infrared LED and light emitting/receiving lenses, these photo ICs detect the distance (near or far) to an object based on a specified distance by utilizing the triangular distance measurement method. When making optical design, photodiode 2 of the dual photodiode in the rangefinder photo IC must be set closer to the infrared LED as shown below.



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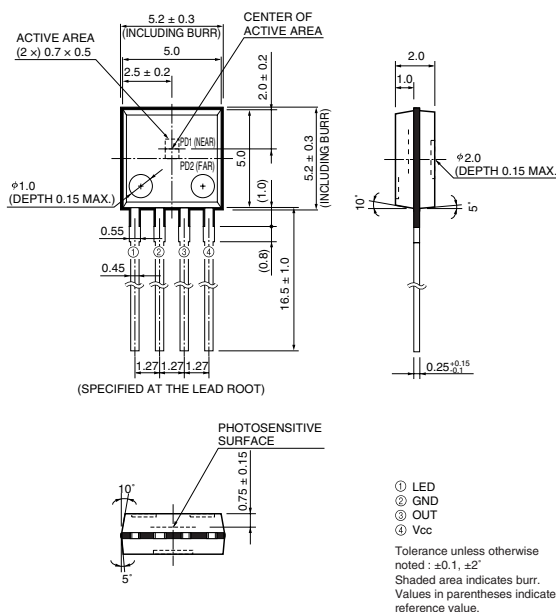
■ Dimensional outline (unit: mm)

S8030



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S8064



KPICA0037EA

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