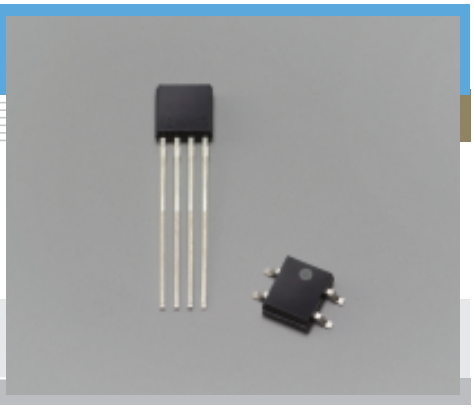

Photo IC for rangefinder
S8030, S8064

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	V_{LED}	-0.5 to +7.0		V
LED terminal current	I_{LED}	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	λp		-	850	-	nm
Photo sensitivity	S	λ=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	I_{LEDH}	V_{LED}=5 V	-	-	1	μA
Low level LED output voltage	V_{LEDL}	Sink 10 mA	-	0.2	0.4	V
Low level LED pulse width	Tw		4.6	7	10.5	μs
LED pulse cycle	Tp		150	224	336	μs
Threshold input difference current	I_{TH}	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	I_{OH}	V_{OUT}=5 V	-	-	1	μA
Low level output voltage	V_{OL}	Sink 10 mA	-	0.2	0.4	V

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

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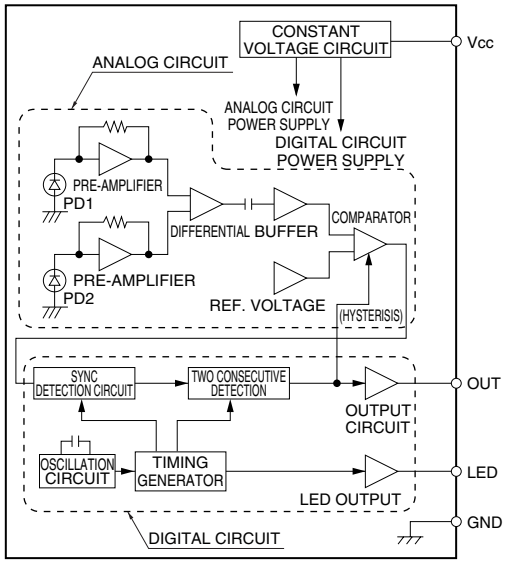
■ Block diagram



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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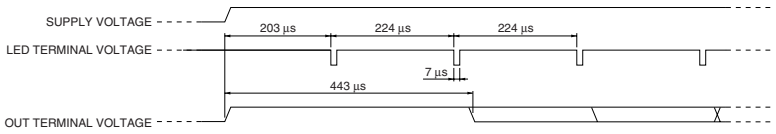
■ Timing chart: two consecutive measurements



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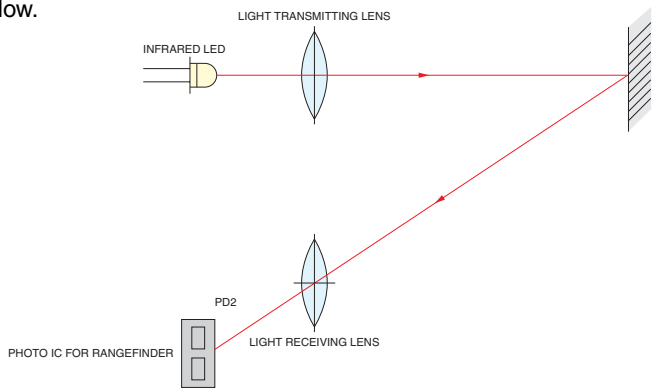
■ Functions and optical systems

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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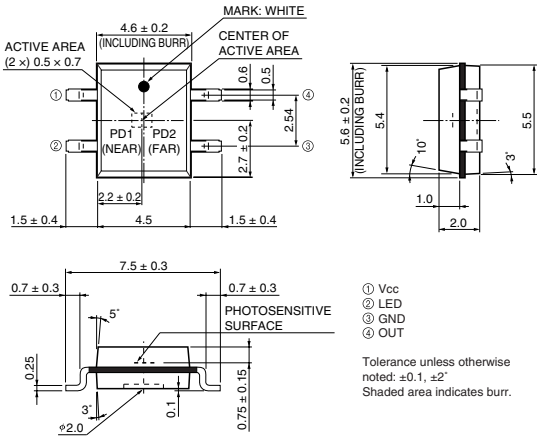
■ Dimensional outline (unit: mm)

S8030



① Vcc
② LED
③ GND
④ OUT

Tolerance unless otherwise noted: ±0.1, ±2°
Shaded area indicates burr.

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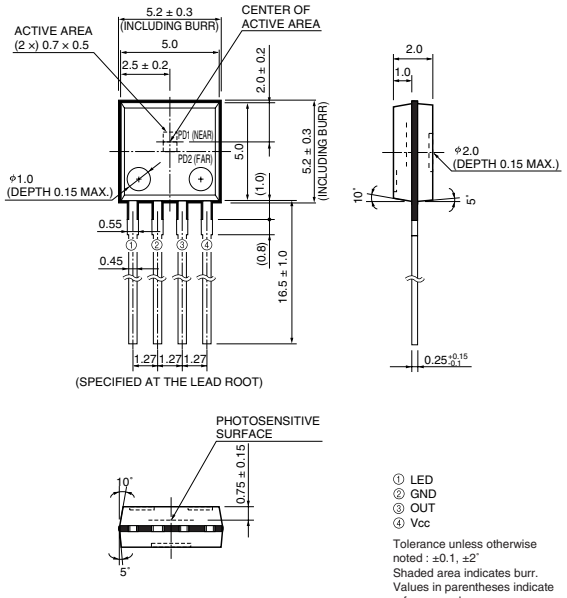
S8064



① LED
② GND
③ OUT
④ Vcc

Tolerance unless otherwise noted : ±0.1, ±2°
Shaded area indicates burr.
Values in parentheses indicate reference value.

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Cat. No. KPIC1028E01
Jan. 2001 DN