

Photo IC for optical switch

S9364

Analog output photo IC with background DC light eliminator



S9364 is a photo IC that outputs a voltage signal at an amplitude proportional to the intensity of pulsed light incident on the photodiode. S9364 eliminates influence of background DC light by a specially designed signal processing circuit (allowable background light level: 10,000 lx Min.) and amplifies only the pulsed light for output. The analog output allows you to set various signal processing and decision processing tasks by means of a latter-stage processing circuit. A standby mode is also incorporated to reduce current consumption during standby.

Features

- Switchable gain function (H/L gain switching by GCT terminal input)
- Standby mode (switchable by OCT terminal input)
- Allowable background light level: 10,000 lx Min.
- Adjustable low band cut-off frequency
Setting by external capacitance $f_c = 1 / (2 \cdot \pi \cdot 20 \text{ k} \cdot C_{ext})$ Typ.
- Built-in large area (1.1 × 1.1 mm) photodiode
- Visible cut plastic package: 4.5 × 5.5 mm

Applications

- Optical switch

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	-0.5 to +7	V
Output voltage	Vo	-0.5 to +7	V
Output current	Io	1	mA
Power dissipation *1	P	250	mW
Operating temperature	Topr	-40 to +85	°C
Storage temperature	Tstg	-40 to +90	°C
Soldering	Tsol	260	°C

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

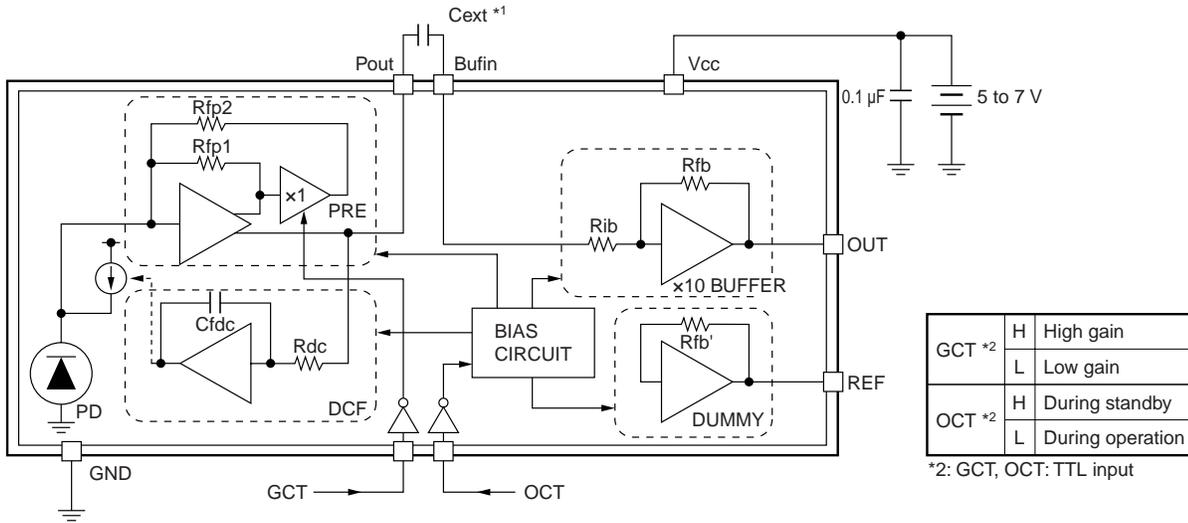
■ Electrical and optical characteristics (Ta=25 °C, Vcc=5 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	720 to 1120	-	nm
Peak sensitivity wavelength	λ_p		-	850	-	nm
Operating supply voltage	Vcc		4.5	-	7	V
Current consumption	Icc1	Io=0 mA, GCT="H", Pi=0 *2, OCT="L"	-	4.5	5.5	mA
	Icc2	Io=0 mA, GCT="L", Pi=0 *2, OCT="L"	-	4.0	5.0	
	Icc3	Io=0 mA, Pi=0 *2, OCT="H"	-	0.6	0.7	
Dark output	Vd		2.1	2.25	2.4	V
Photo sensitivity	S1	GCT="H", $\lambda_p=850$ nm	0.33	0.45	0.57	V/ μ W
	S2	GCT="L", $\lambda_p=850$ nm	0.031	0.042	0.053	
Allowable background light level	Ex	"A" light source	10,000	-	-	lx
Low band cut-off frequency	fc-L	Cext=4 nF, -3 dB	1.6	2.2	2.8	kHz
High band cut-off frequency	fc-H1	Cext=4 nF, GCT="H", -3 dB	280	350	420	kHz
	fc-H2	Cext=4 nF, GCT="L", -3 dB	360	450	540	
Output noise voltage	Vn1	Cext=4 nF, GCT="H"	-	-	2.0	mVrms
	Vn2	Cext=4 nF, GCT="L"	-	-	1.0	
Output drift without light input	Tc	Pi=0 *2	-	-6.6	-	mV/°C

*2: This indicates operational state with no light input including background light.

Note) Connect a capacitor of 0.01 μ F or more between Vcc and GND terminal.

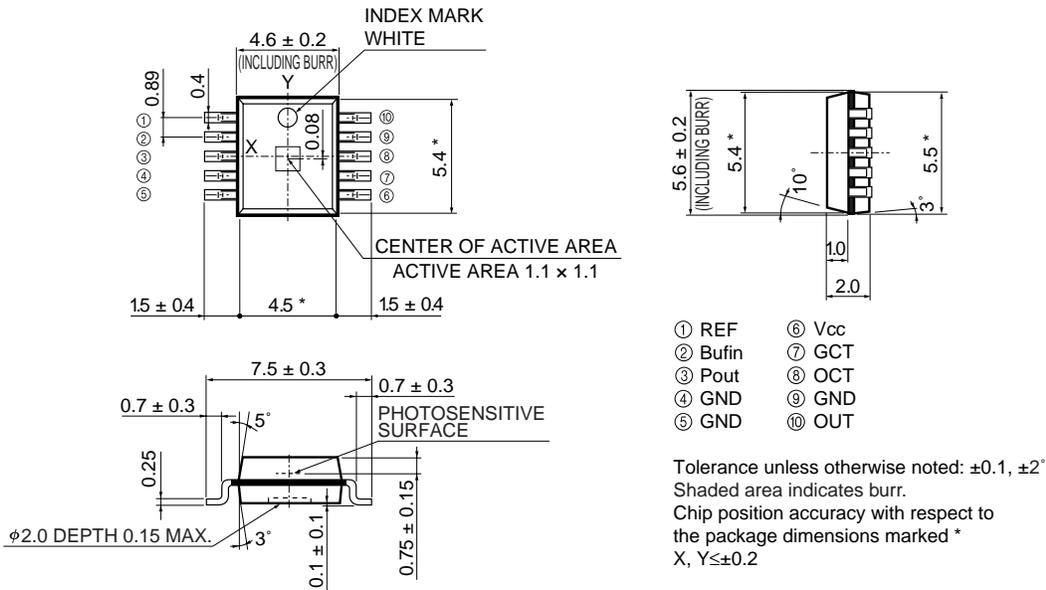
■ Functional block diagram



*1: Low band cut-off frequency is determined by the Cext capacitance.
 $f_c = 1 / (2 \cdot \pi \cdot 20 \text{ k} \cdot \text{Cext})$

KPIC0090EA

■ Dimensional outline (unit: mm)



KPICA1055EA