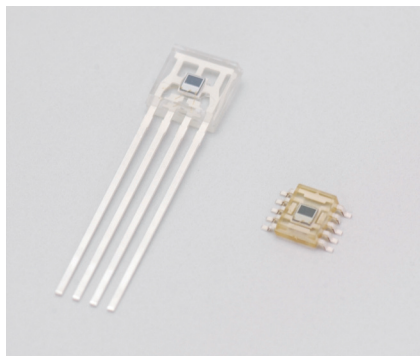


Photo IC for optical switch

S11049 series



Analog output photo IC for optical switch

The S11049 series photo ICs are designed for optical switches and provides an analog waveform output proportional to the intensity of incident pulsed light.

Features

- Large allowable background light level: 4000 lx min.
- High linearity
- Low noise: 1.8 mV rms max.

Applications

- Optical switch
- Optical receivers in various sensor devices

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	S11049-202SB	S11049-203DT	Unit
Supply voltage	Vcc		-0.5 to +7	V
Power dissipation*1	P	250	300	mW
Output voltage	Vout		-0.5 to +7	V
Operating temperature*2	Topr		-25 to +85	°C
Storage temperature*2	Tstg	-40 to +100	-30 to +85	°C
Soldering temperature	Tsol	*3	240 (once)*4	°C

*1: Power dissipation decreases at a rate of 3.3 mW/°C on the S11049-202SB and 4 mW/°C on the S11049-203DT at Ta=25 °C and above.

*2: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

*3: See the recommended soldering conditions (P.6).

*4: Reflow soldering, IPC/JEDEC J-STD-020 MSL 5a, see P.6

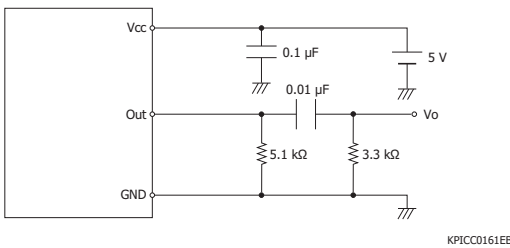
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C, Vcc=5.0 V)

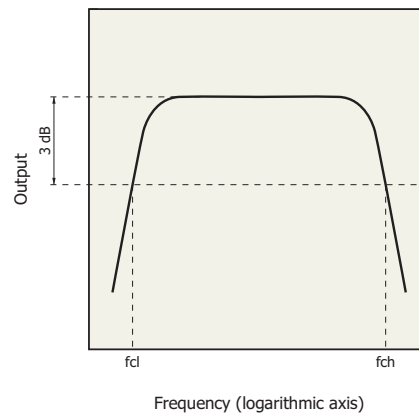
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Vcc		4.5	-	5.5	V
Current consumption	Icc		-	-	2.2	mA
Spectral response range	λ		-	380 to 1120	-	nm
Peak sensitivity wavelength	λ_p		-	800	-	nm
Photo sensitivity	S11049-202SB	A $\lambda=950\text{ nm}^{*5}$ Input signal=100 kHz Including diffused reflection inside package	120	200	300	V/mW
	S11049-203DT		160	200	300	
AC photoelectric sensitivity linearity	Alin	Input pulse signal 0.01 μW to 4.0 μW^{*5} Input pulse signal 4.0 μW to 7.5 μW^{*5}	-10	-	+10	%
			-50	-	+50	
Cut-off frequency ^{*6}	Low band	fcl	-	-	50	kHz
	High band	fch	1250	1450	1650	
Allowable background light level ^{*7}	Pdc	Input pulse signal 2.5 μW^{*5}	4000	6000	-	L_x
Output noise voltage (with no input)	VON	^{*5}	-	-	2.8	mV rms

*5: Measurement circuit (Waveform at terminal Vo is measured.)

*6: Cutoff frequency definition



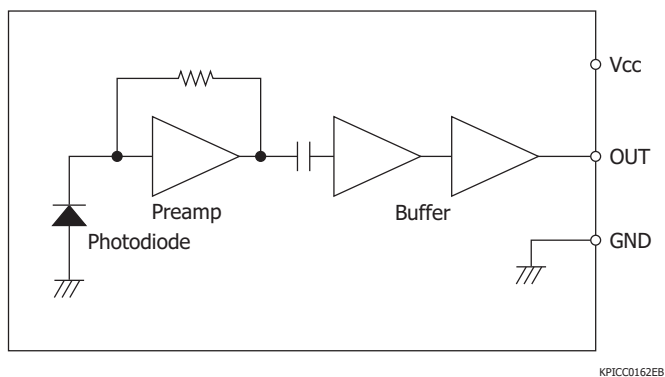
KPIC0161EB



KPIC0241EA

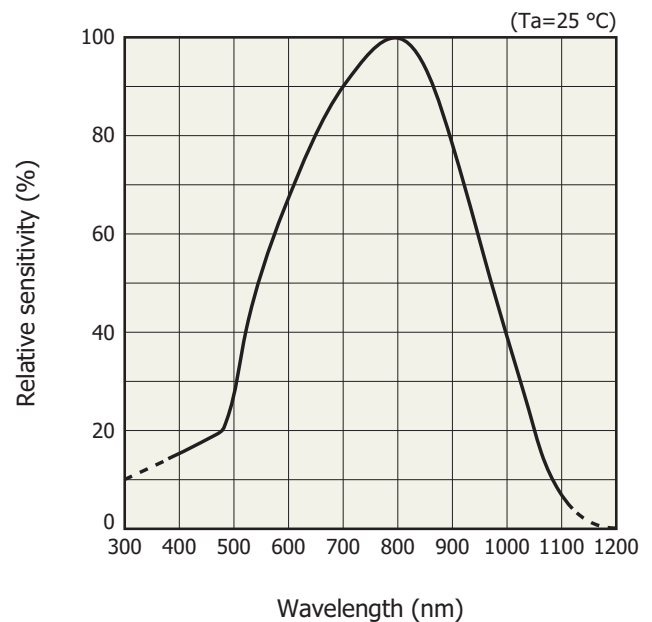
*7: This is defined as the background light level in the active area at which the photo IC sensitivity drops by 20%

Block diagram



KPIC0162EB

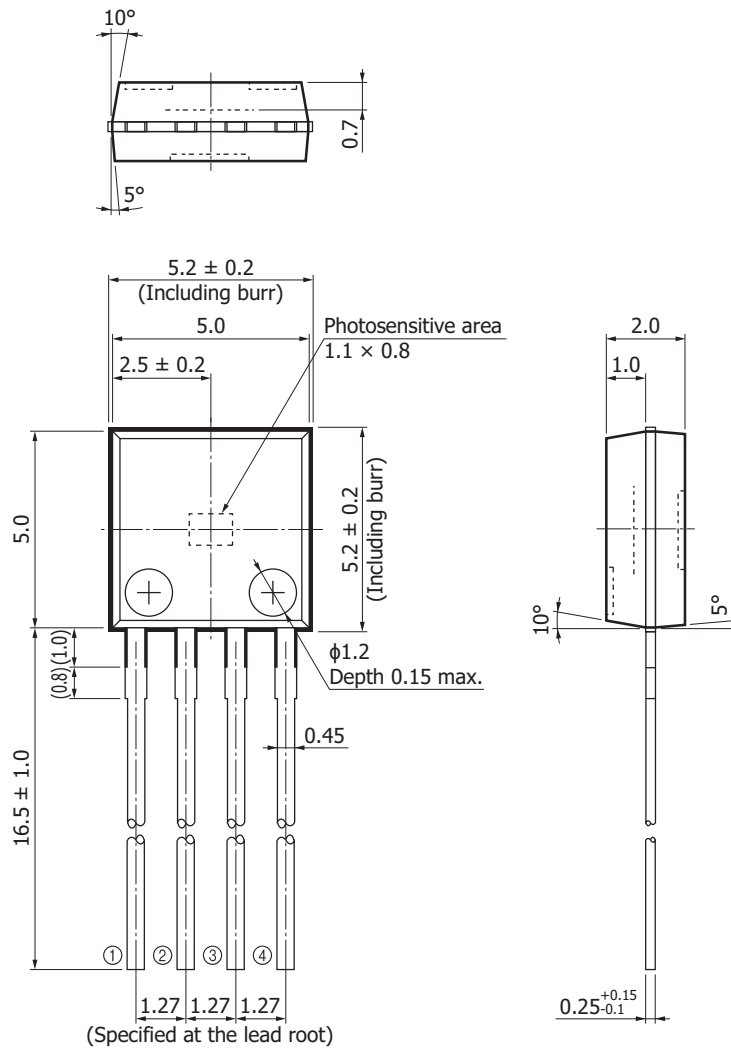
Spectral response (typical example)



KPIC0142EC

Dimensional outlines (unit: mm)

S11049-202SB

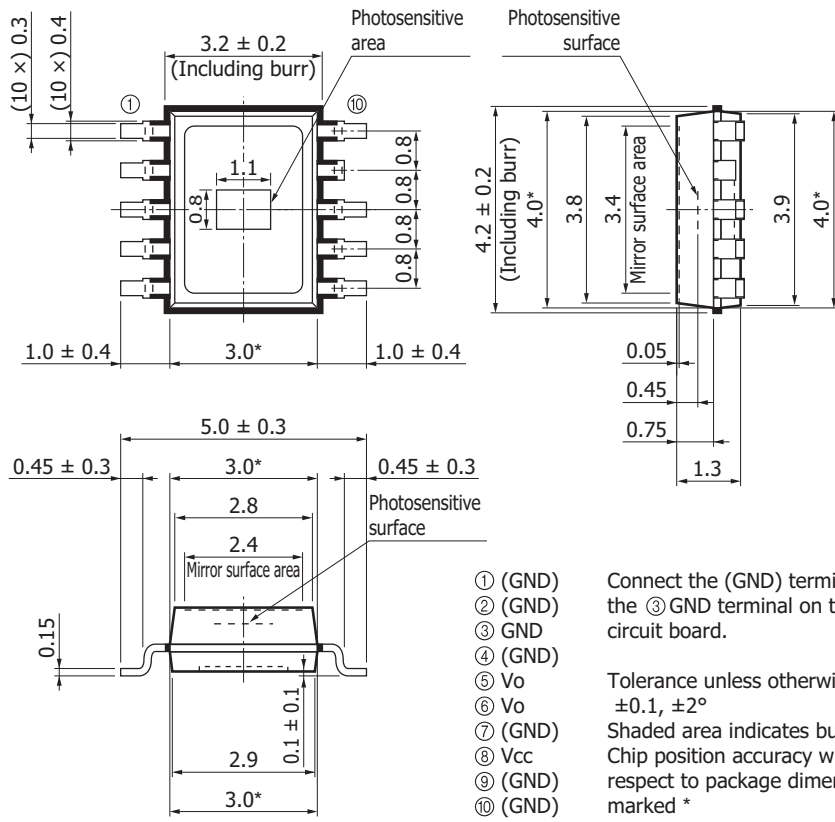


- ① GND
- ② Vout
- ③ Vcc
- ④ GND

Tolerance unless otherwise noted: ± 0.1 , $\pm 2^\circ$
 Shaded area indicates burr.
 Values in parentheses are not guaranteed,
 but for reference.
 Lead surface finish: silver plating

KPICA0083EB

S11049-203DT



Connect the (GND) terminal to the ③ GND terminal on the circuit board.

Tolerance unless otherwise noted: $\pm 0.1, \pm 2^\circ$

Shaded area indicates burr.
Chip position accuracy with respect to package dimensions marked *
 $X, Y \leq \pm 0.2, \theta \leq \pm 2^\circ$

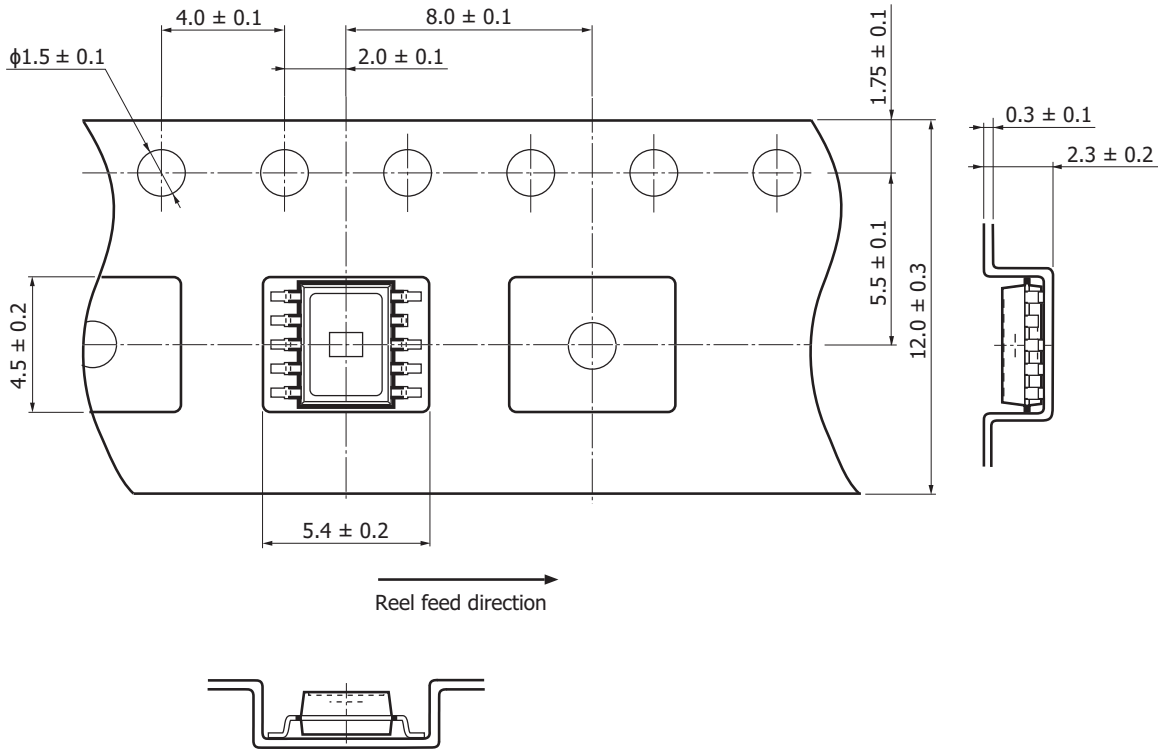
KPICA0092EA

Reel packing specifications (S11049-203DT)

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ254 mm	φ100 mm	12 mm	PS	Antistatic treatment

■ Embossed tape (unit: mm, material: PS, electrically conductive)



KPIC0238EB

■ Packing quantity
2000 pcs/reel

■ Packing type
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

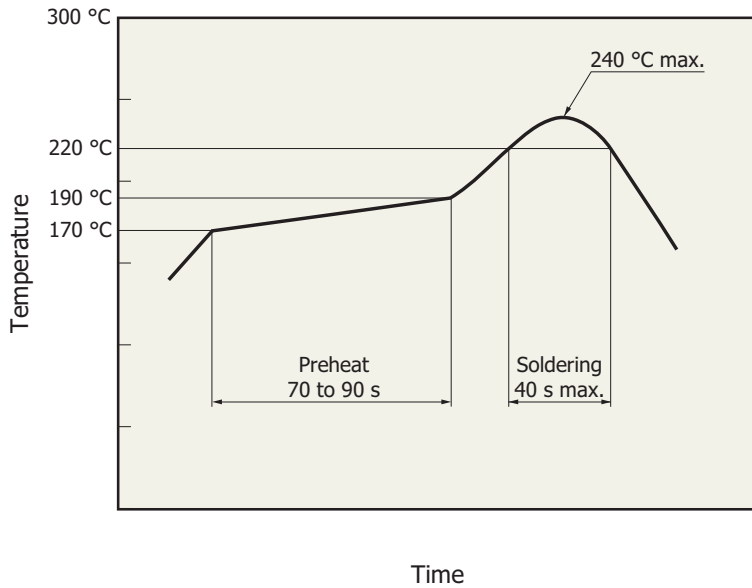
Recommended soldering conditions

S11049-202SB

Parameter	Specification	Remarks
Solder temperature	260 °C max. (once, less than 5 s)	at least 1.8 mm away from lead roots

Note: When setting the soldering conditions, check for any problems by testing out the soldering methods in advance.

S11049-203DT



KPICB0171EA

Note:

- These products support lead-free soldering. After unpacking, store them in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 24 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. When setting the reflow soldering conditions, check for any problems by testing out the reflow soldering methods in advance.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

- Disclaimer
- Metal, ceramic, plastic package products
- Surface mount type products

Information described in this material is current as of June 2020.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

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