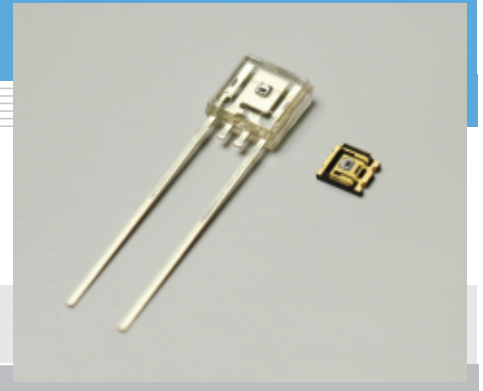


# Photo IC diode S9066-111, S9067-101

Spectral response close to human eye sensitivity



The S9066-111, S9067-101 photo ICs have spectral response close to human eye sensitivity. Two active areas are made on a single chip. One is for detecting light in the visible to near infrared range and the other is only sensitive to near infrared light and used for output signal correction. Almost only the visible range can be measured by finding the difference between the two output signals in the internal current amplifier circuit. Compared to previously available devices, these photo ICs offer lower output fluctuations for light sources producing the same illuminance at different color temperatures.

### Features

- Spectral response close to human eye sensitivity is attained without using visual-compensated filter.
- Operation just as easy to use as a photodiode
- Large output current equivalent to phototransistors
- Lower output-current fluctuations
- Excellent linearity
- Low output fluctuations for light sources producing the same illuminance at different color temperatures

### Applications

- Energy-saving sensor for TVs, etc.
- Light dimmers for liquid crystal panels
- Cellular phone backlight dimmers
- Various types of light level measurement

### Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	S9066-111	S9067-101	Unit
Reverse voltage	VR	-0.5 to 12		V
Photocurrent	IL	5		mA
Forward current	IF	5		mA
Power dissipation *1	P	250	150	mW
Operating temperature	Topr	-30 to +80		°C
Storage temperature	Tstg	-40 to +85		°C

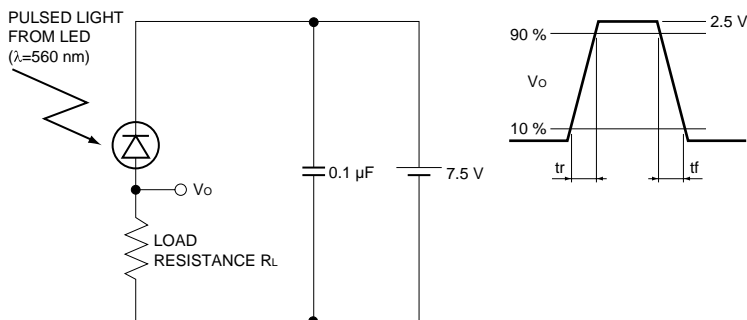
\*1: Derate power dissipation at a rate of the following rate above Ta=25 °C.

S9066-111: -3.3 mW/°C, S9067-101: -2.0 mW/°C

### Electrical and optical characteristics (Ta=25 °C)

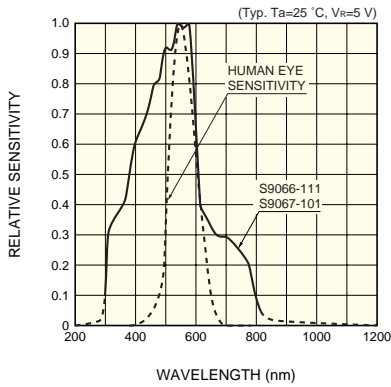
Parameter	Symbol	Condition	S9066-111			S9067-101			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		300 to 820			300 to 820			nm
Peak sensitivity wavelength	$\lambda_p$		-	560	-	-	560	-	nm
Dark current	ID	VR=5 V	-	1.0	50	-	1.0	50	nA
Photocurrent	IL	VR=5 V, 2856 K, 100 lx	0.19	0.27	0.35	0.18	0.26	0.34	mA
Rise time *2	tr	10 to 90 %, VR=7.5 V	-	6.0	-	-	6.0	-	ms
Fall time *2	tf	RL=10 k $\Omega$ , $\lambda$ =560 nm	-	2.5	-	-	2.5	-	ms

\*2: Rise/fall time measurement method



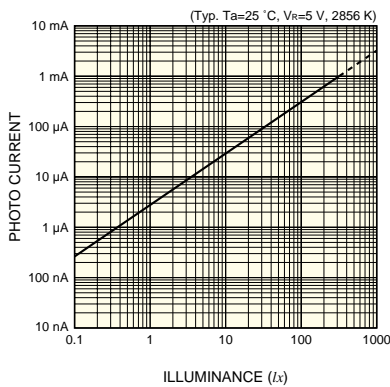
KPIC0041EA

## Spectral response



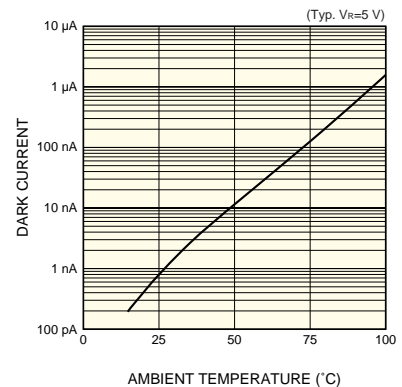
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## Linearity (S9066-111)



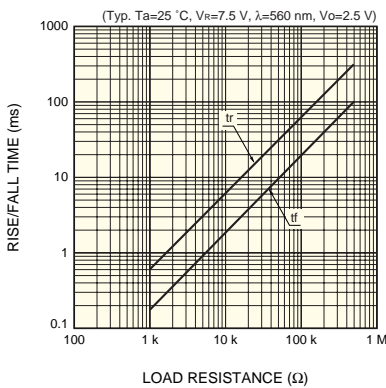
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## Dark current vs. ambient temperature



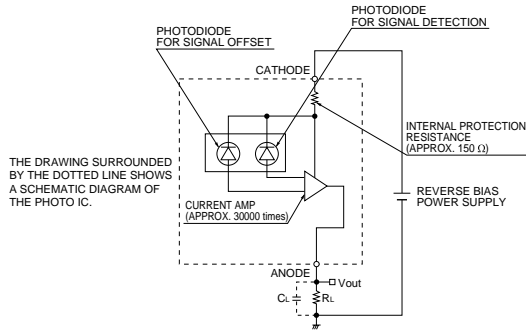
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## Rise/fall times vs. load resistance



KPICB0115EA

## Operating circuit example



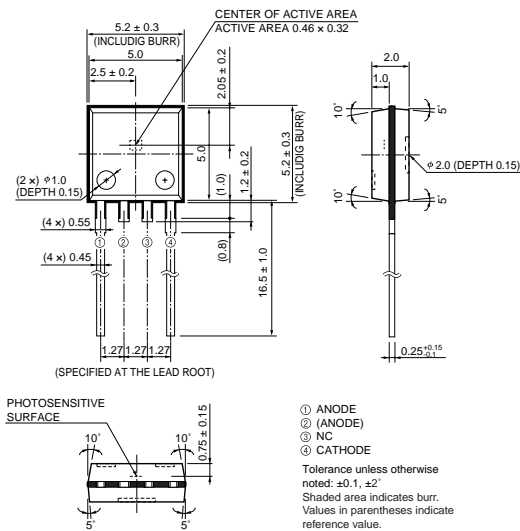
KPICC0091EB

The photo IC diode must be reverse-biased so that a positive potential is applied to the cathode. To eliminate high-frequency components, we recommend placing a load capacitance  $C_L$  in parallel with load resistance  $R_L$  as a low-pass filter.

$$\text{Cut-off frequency } f_c \approx \frac{1}{2\pi C_L R_L}$$

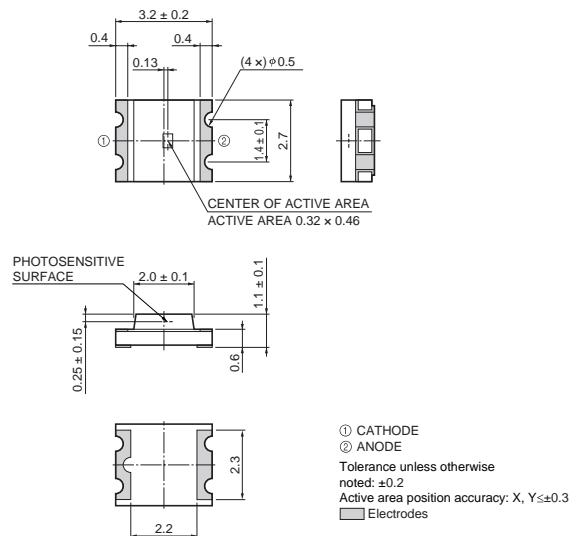
## Dimensional outlines (unit: mm)

S9066-111



KPICA0050EE

S9067-101



KPICA0051EC

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