

## Features

S1087, S1133 : For visible range

S1087-01, S1133-01 : For visible to IR range

S1133-14 : For visible to near IR range

## Application

Exposure meter

Illuminometer

Camera auto exposure

Stroboscope light control

Copier

Display light control

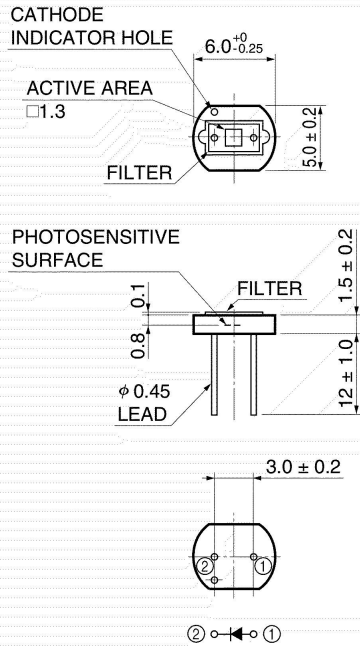
Optical switch

## Description

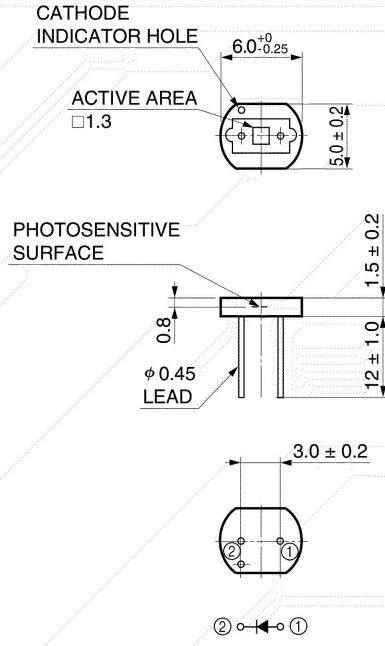
The S1087/S1133 series are ceramic package photodiodes that offer low dark current. Ceramic package used is light-impervious, so no stray light can reach the active area from the side or backside. This allows reliable optical measurements in the visible to near infrared range, over a wide dynamic range from low light levels to high light levels.

**PACKAGE DIMENSIONS** (unit: mm, tolerance unless otherwise noted:  $\pm 0.15$ )

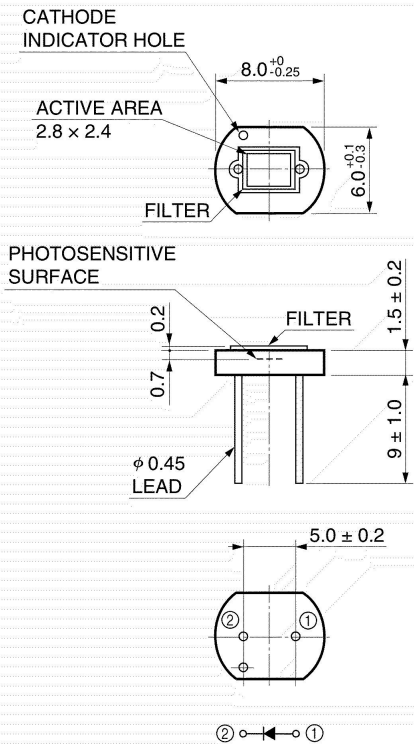
① S1087



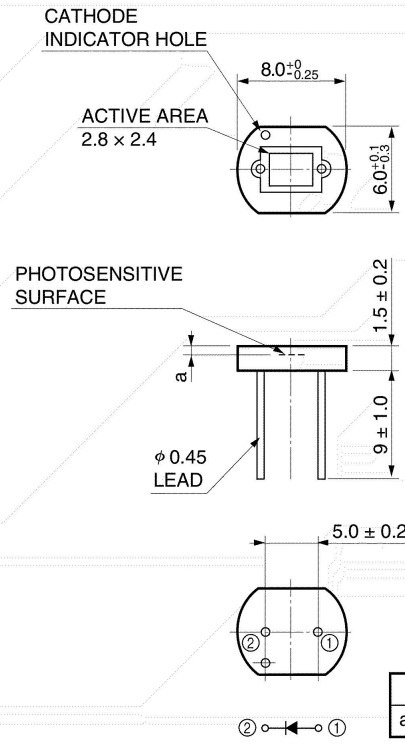
② S1087-01



③ S1133



④ S1133-01/-14



	S1133-01	S1133-14
a	0.7	0.6

**ABSOLUTE MAXIMUM RATINGS AT TA =25°C**

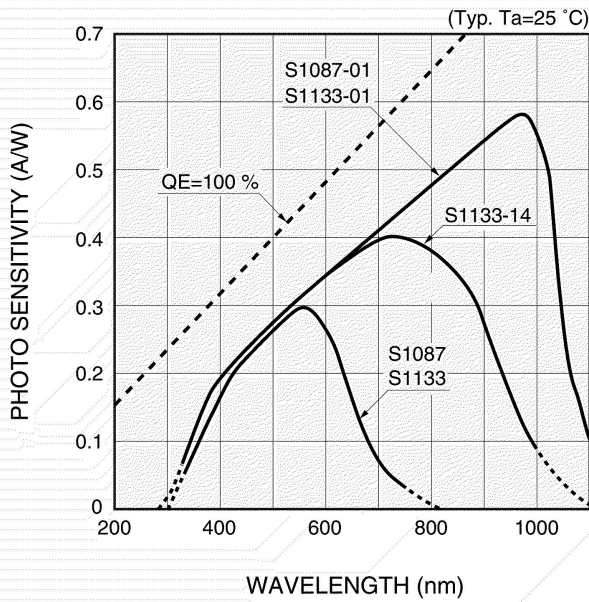
Type No.	Dimensional outline/ Window material *	Active area size (mm)	Effective active area (mm <sup>2</sup> )	Absolute maximum ratings		
				Reverse voltage VR Max. (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
S1087	①/V	1.3 × 1.3	1.6	10	-10 to +60	-20 to +70
S1087-01	②/R					
S1133	③/V	2.4 × 2.8	6.6			
S1133-01	④/R					
S1133-14						

\* Window material R: resin coating, V: visual-compensation filter

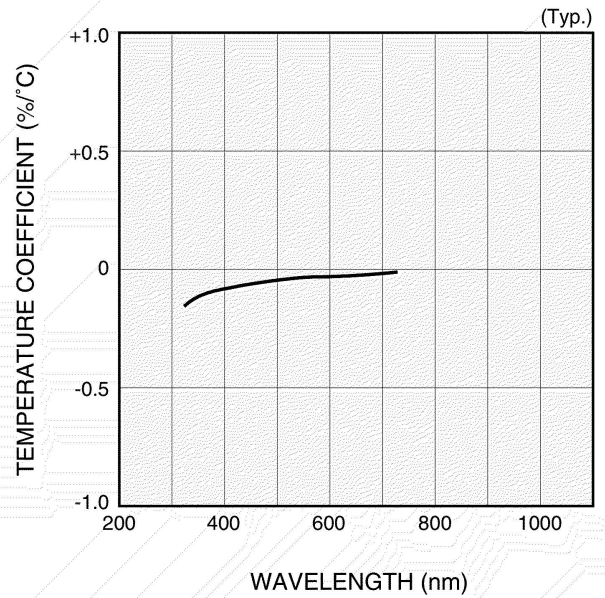
**BASIC CHARACTERISTICS AT TA=25°C**

Type No.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Photo sensitivity S (A/W)			Infrared sensitivity ratio (%)	Short circuit current Isc 100 lx ( $\mu$ A)	Temp. coefficient of Isc (%/°C)	Dark current Id VR=1 V Max. (pA)	Temp. coefficient of Id TCID (times/°C)	Rise time tr VR=0 V RL=1 k $\Omega$ ( $\mu$ s)	Terminal capacitance Ct VR=0 V f=10 kHz (pF)	Shunt resistance Rsh VR=10 mV	
			$\lambda_p$	GaP LED 560 nm	He-Ne laser 633 nm								Min. (G $\Omega$ )	Typ. (G $\Omega$ )
S1087	320 to 730	560	0.3	0.3	0.19	10	0.16	-0.01	10	1.12	0.5	200	10	250
S1087-01	320 to 1100	960	0.58	0.33	0.38	-	1.3	0.1						
S1133	320 to 730	560	0.3	0.3	0.19	10	0.65	-0.01	0.1	2.5	700	10	100	
S1133-01	320 to 1100	960	0.58	0.33	0.38	-	5.6							
S1133-14	320 to 1000	720	0.4		0.37	-	3.4							

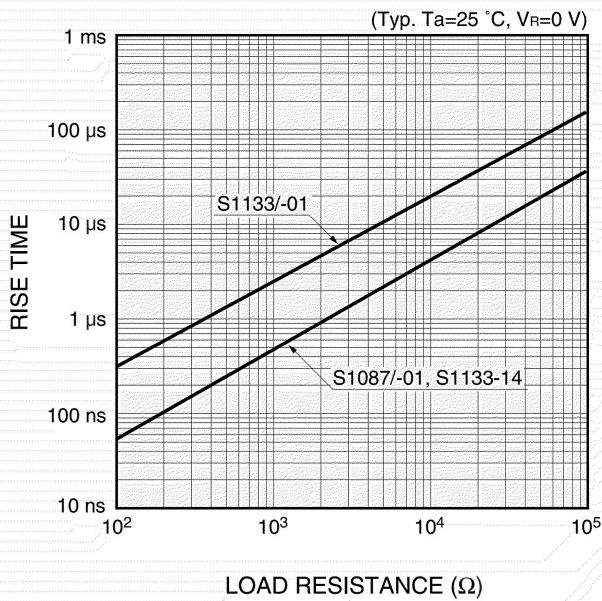
■ Spectral response



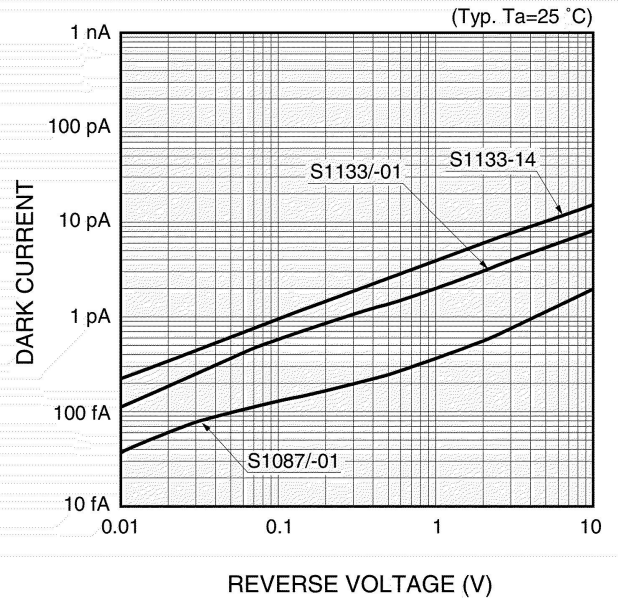
■ Photo sensitivity temperature characteristic (typical example: S1087)



■ Rise time vs. load resistance

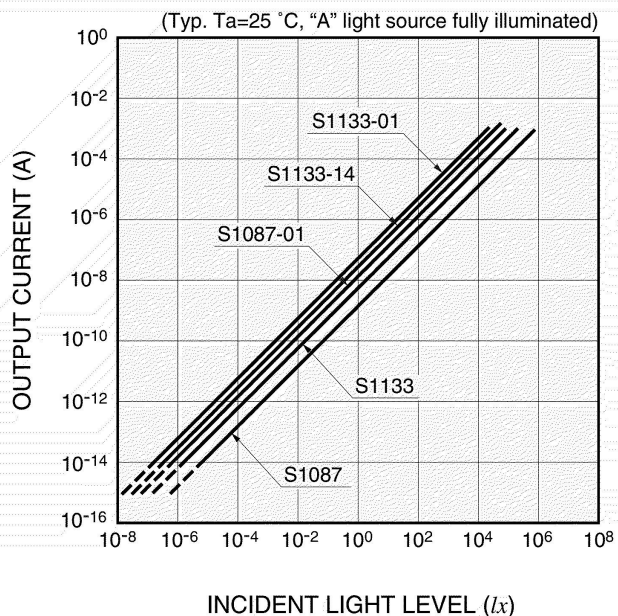
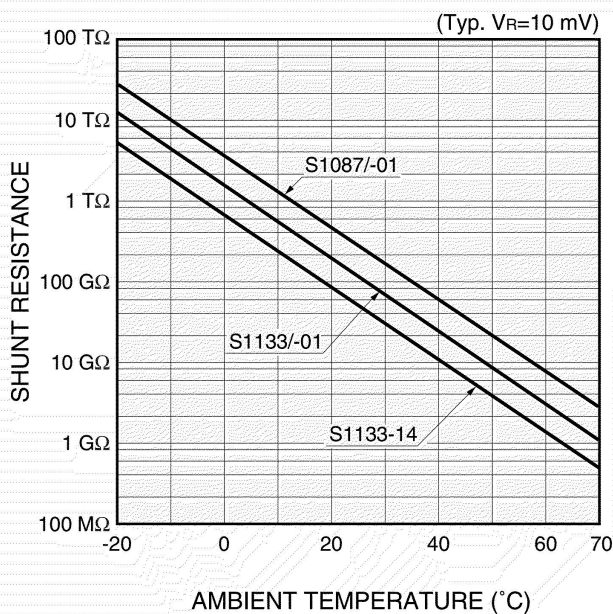


■ Dark current vs. reverse voltage



■ Shunt resistance temperature characteristics


■ Short circuit current linearity



## Packing Quantity Specification

1. 160Pcs/1Box,10 Boxes/1 Carton

## Label Form Specification

製品名 PRODUCT	
コードNo. CODE No.	
数量 Q'TY	
ロットNo. LOT No.	
備考 REMARKS	
	

- PRODUCT: Part Number
- CODE NO.: Product Serial Number
- QTY: Packing Quantity
- LOT No: Lot Number
- REMARKS:Remarks

## Notes

### Lead Forming

1. During lead frame bending, the lead frame should be bent at a distance more than 3mm from bottom of the epoxy.

Note: Must fix lead frame and do not touch epoxy before bending to avoid Photodiode broken.

2. Lead forming should be done before soldering.

3. Avoid stressing the Photodiode package during leads forming. The stress to the base may damage the Photodiode's characteristics or it may break the Photodiode.

4. Cut the Photodiode lead frame at room temperature. Cutting the lead frame at high temperatures may cause failure of the Photodiode.

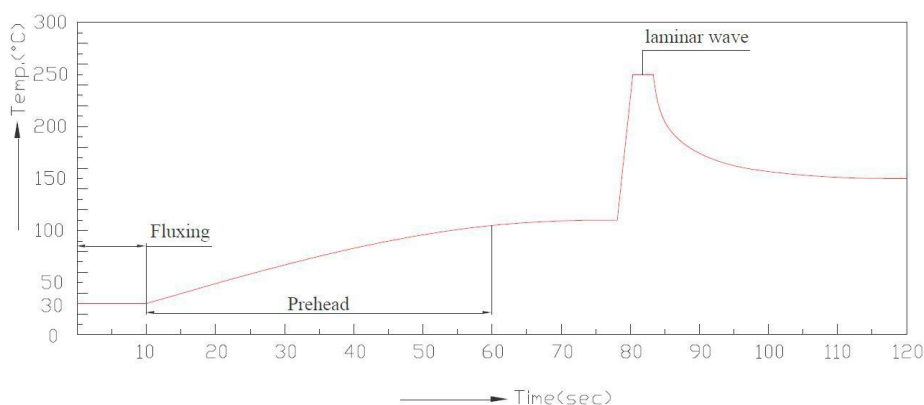
5. When mounting the Photodiode onto a PCB, the PCB holes must be aligned exactly with the lead position of the Photodiode. If the Photodiode are mounted with stress at the leads, it causes deterioration of the epoxy resin and this will degrade the Photodiode.

## Soldering

- Careful attention should be paid during soldering. When soldering, leave more than 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.
- Recommended soldering conditions:

Hand Soldering		DIP Soldering	
Temp. at tip of iron	300°C Max. (30W Max.)	Preheat temp.	100°C Max. (60 sec Max.)
Soldering time	3 sec Max.	Bath temp. & time	260 Max., 5 sec Max
Distance	3mm Min.(From solder joint to epoxy bulb)	Distance	3mm Min. (From solder joint to epoxy bulb)

### 3. Recommended soldering profile



- Avoiding applying any stress to the lead frame while the Photodiode are at high temperature particularly when soldering.
- Dip and hand soldering should not be done more than one time
- After soldering the Photodiode, the epoxy bulb should be protected from mechanical shock or vibration until the Photodiode return to room temperature.
- A rapid-rate process is not recommended for cooling the Photodiode down from the peak temperature.
- Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Photodiode.
- Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

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