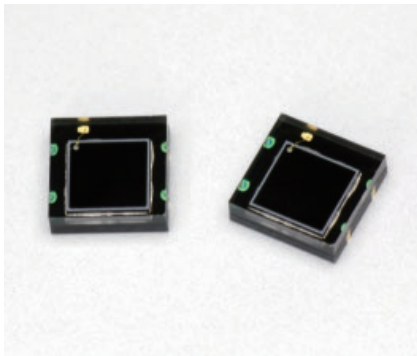


# Si PIN photodiode



S12158-01CT

## COB type, applicable to lead-free solder reflow

The S12158-01CT is a Si PIN photodiode for visible to near infrared range and is compatible with lead-free solder reflow processes. The small and thin leadless package allows reducing the mount area on a printed circuit board.

### Features

- COB type, small and thin leadless package
- Applicable to lead-free solder reflow
- Photosensitive area: 2.77 × 2.77 mm
- High sensitivity: 0.7 A/W ( $\lambda=960$  nm)

### Applications

- FSO (free space optics)
- Optical switches
- Laser radar, etc.

### Structure

Parameter	Specification	Unit
Photosensitive area	2.77 × 2.77	mm
Package	Glass epoxy	-
Seal material	Epoxy resin	-

### Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	$V_R$ max	$T_a=25$ °C	20	V
Operating temperature	$T_{opr}$		-25 to +85	°C
Storage temperature	$T_{stg}$		-40 to +100	°C
Reflow soldering conditions*1	$T_{sol}$		Peak temperature 260 °C, 2 times (see page 4)	-

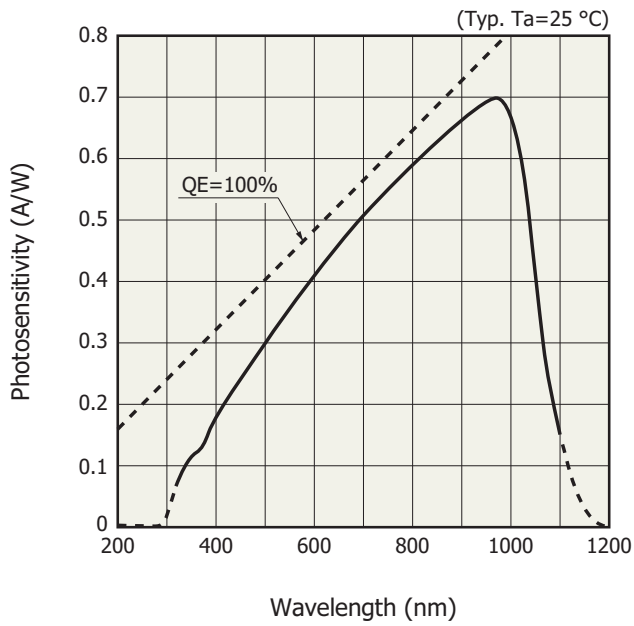
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

\*1: JEDEC level 4

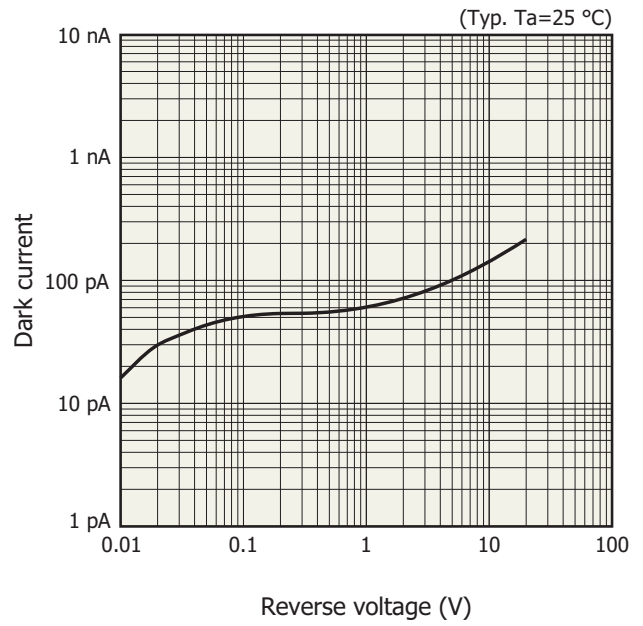
### Electrical and optical characteristics ( $T_a=25$ °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$		-	320 to 1100	-	nm
Peak sensitivity wavelength	$\lambda_p$		-	960	-	nm
Photosensitivity	$S$	$\lambda=\lambda_p$	0.6	0.7	-	A/W
Dark current	$I_D$	$V_R=12$ V	-	0.1	10	nA
Temperature coefficient of $I_D$	$T_{CID}$	$V_R=12$ V	-	1.15	-	times/°C
Cutoff frequency	$f_c$	$V_R=12$ V, $R_L=50$ $\Omega$ -3 dB	10	25	-	MHz
Terminal capacitance	$C_t$	$V_R=12$ V, $f=1$ MHz	-	15	30	pF

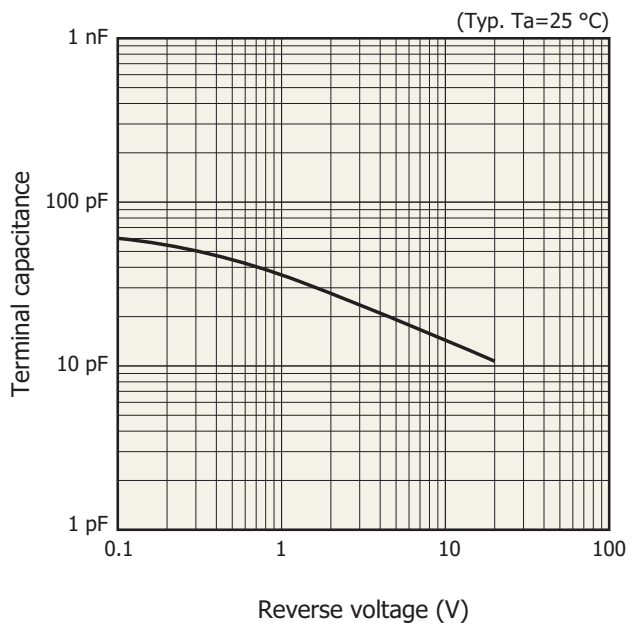
**Spectral response**



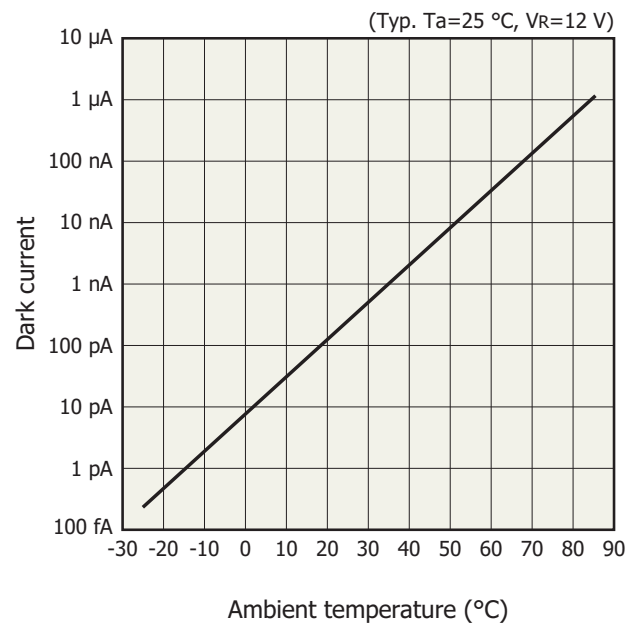
**Dark current vs. reverse voltage**



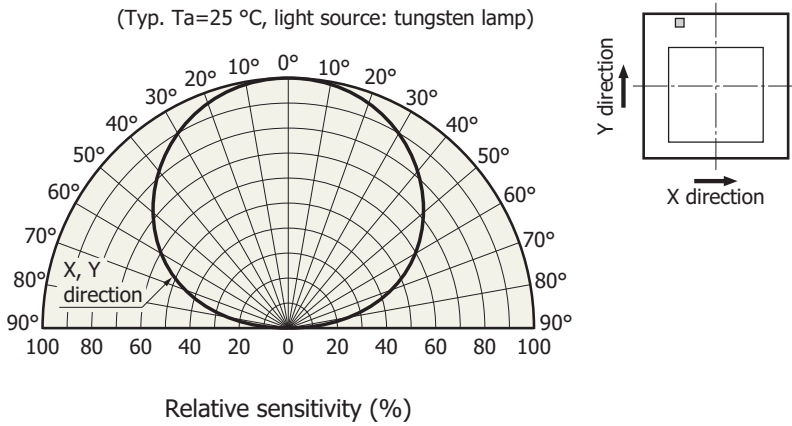
**Terminal capacitance vs. reverse voltage**



**Dark current vs. ambient temperature**

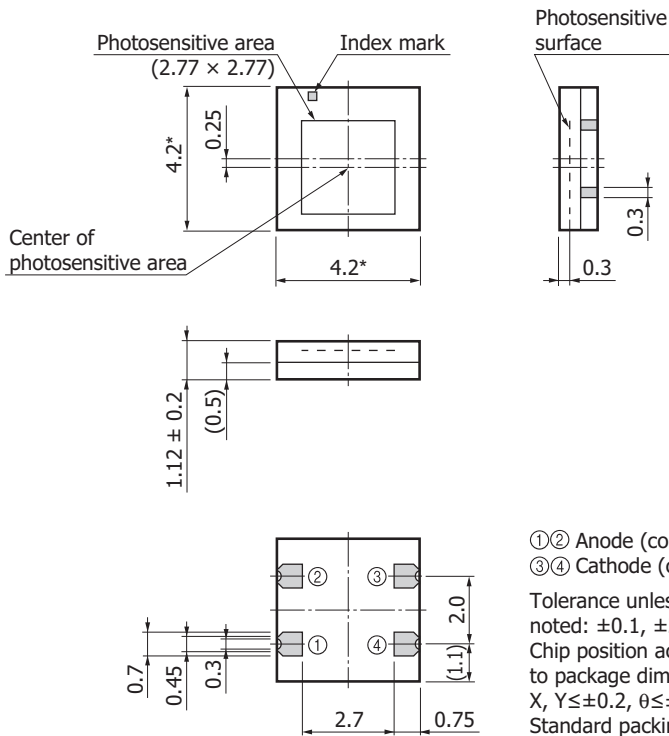


**Directivity**



KPINB0383EA

**Dimensional outline (unit: mm)**



- ①② Anode (common)
- ③④ Cathode (common)

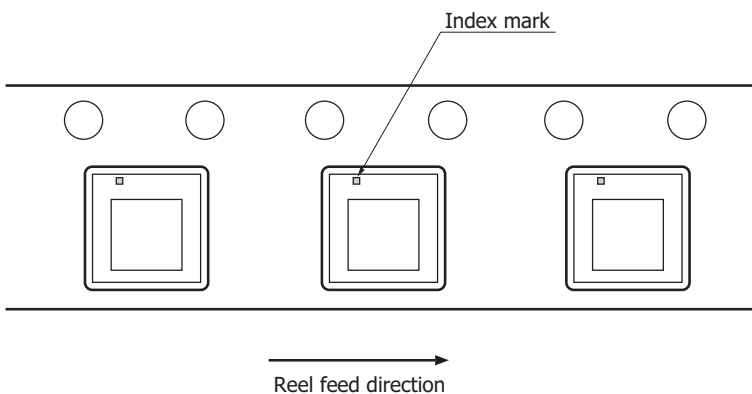
Tolerance unless otherwise noted:  $\pm 0.1, \pm 2^\circ$

Chip position accuracy with respect to package dimensions marked\*

$X, Y \leq \pm 0.2, \theta \leq \pm 2^\circ$   
Standard packing state: reel (2000 pcs/reel)

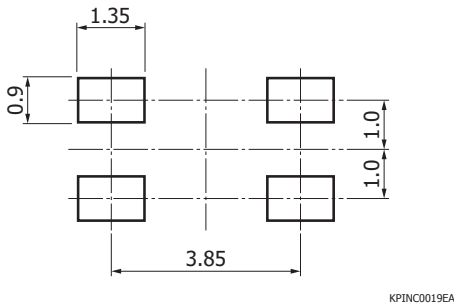
KPINA0113EA

**Product orientation on reel**

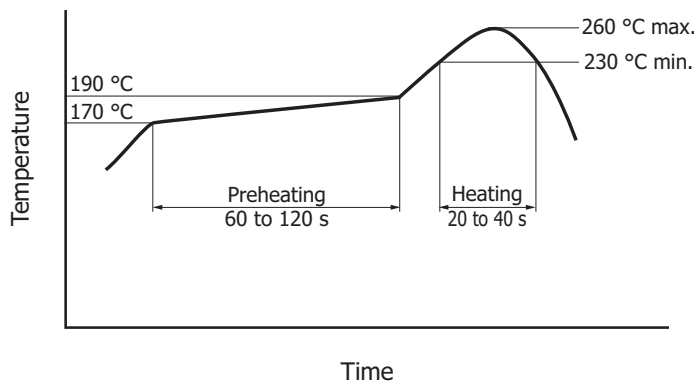


KPIN0020EA

### Recommended land pattern (unit: mm)



### Recommended temperature profile of reflow soldering (typical example)



KPINB0385EA

- After unpacking, store this device in an environment at a temperature of 5 to 30 °C and a humidity below 70%, and perform reflow soldering on this device within 72 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. Before actual cleaning, check for any problems by testing out the cleaning methods in advance. A sudden temperature rise and cooling may be the cause of trouble, so make sure that the temperature change is within 4 °C per second.

Information described in this material is current as of October, 2012.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental 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.

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