

# Surface Mount PIN Photodiode

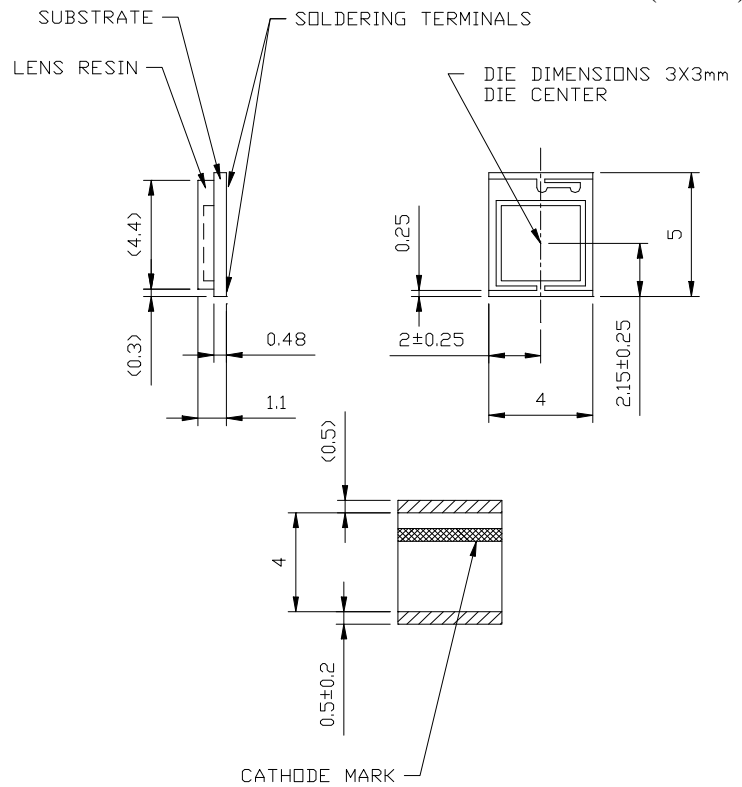
# MSD-12421D

## Description

Wide area surface mount PIN Photodiode.

## Package Dimensions

Unit: mm ( inches )



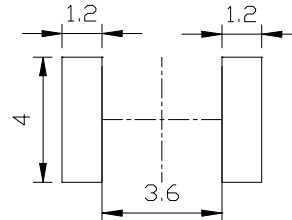
## Features

- Large radiant sensitive area (  $A=7.5\text{mm}^2$  )
- Wide angle of half sensitivity  $\varphi = \pm 65^\circ$
- High photo sensitivity
- Fast response times
- Small junction capacitance
- Suitable for visible and near infrared radiatio

## Applications

High speed photo detector

## Recommended Solder



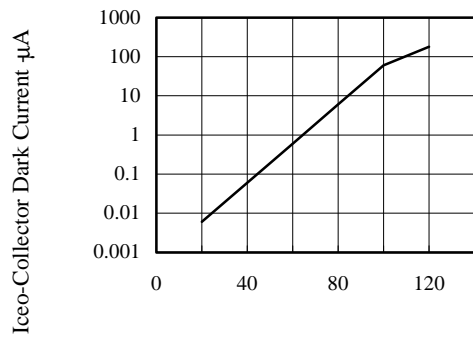
## Absolute Maximum Ratings

Parameter	Test Conditions	Symbol	Value	Units
Reverse Voltage		$V_R$	30	V
Power Dissipation	$T_{amb} @ 25^\circ\text{C}$	$P_V$	215	mW
Junction Temperature		$T_j$	100	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-55 to + 100	$^\circ\text{C}$
Soldering Temperature	$t = 3 \text{ s}$	$T_{sd}$	240	$^\circ\text{C}$
Thermal Resistance Junction / Ambient		$R_{thJA}$	350	K/W

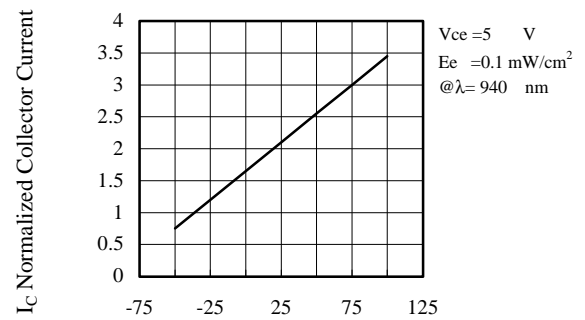
**Optical-Electrical Characteristics**

Parameter	Test Conditions	Symbol	Min.	Typ .	Max.	Unit
Reverse Dark Current	$V_R=10V$ $E=0$	$I_D$	-	2	30	nA
Reverse Breakdown Voltage	$I_R=100\mu A$ $E=0$	$V_{(BR)}$	60	-	-	V
Diode Capacitance	$V_R=0V, f=1MHz, E=0$	$C_D$	-	70	-	pF
	$V_R=3V, f=1MHz, E=0$		-	25	40	
Open Circuit Voltage	$E_e=1 \text{ mW/cm}^2, \lambda=950 \text{ nm}$	$V_o$	-	350	-	mV
Temp. Coefficient of $V_o$	$E_e=1 \text{ mW/cm}^2, \lambda=950 \text{ nm}$	$TK_{I_K}$	-	-2.6	-	mV/K
Short Circuit Current	$E_A=1 \text{ klx}, V_R=5V$	$I_K$	-	70	-	$\mu A$
	$E_e=1 \text{ mW/cm}^2, \lambda=950 \text{ nm}$	$I_K$	-	50	-	
Temp. Coefficient of $I_K$	$E_e=1 \text{ mW/cm}^2, \lambda=950 \text{ nm}$	$TK_{V_o}$	-	0.1	-	%/K
Reverse Light Current	$E_A=1 \text{ klx}, V_R=5V$	$I_{ra}$	-	75	-	$\mu A$
	$E_e=1 \text{ mW/cm}^2, \lambda=950 \text{ nm}, V_R=5V$	$I_{ra}$	40	55	-	
Angle of Half Sensitivity		$\phi$	-	$\pm 65$	-	deg
Wavelength of Peak Sensitivity		$\lambda_p$	-	900	-	nm
Range of Spectral Bandwidth		$\lambda_{0.5}$	-	600...1050	-	nm
Noise Equivalent Power	$V_R=10V, \lambda=950 \text{ nm}$	NEP	-	$4 \times 10^{-14}$	-	$W/\sqrt{Hz}$
Rise Time	$V_R=10V, R_L=1K, \lambda=820 \text{ nm}$	$t_r$	-	100	-	ns
Fall Time	$V_R=10V, R_L=1K, \lambda=820 \text{ nm}$	$t_f$	-	100	-	ns

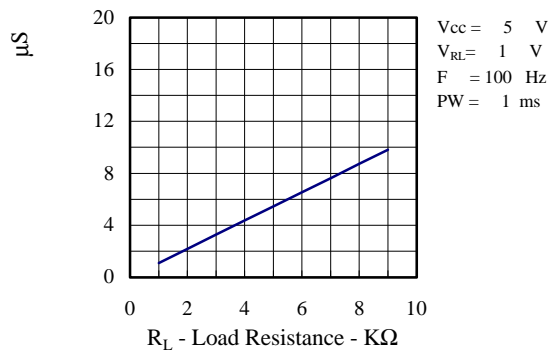
## Typical Optical-Electrical Characteristic Curves



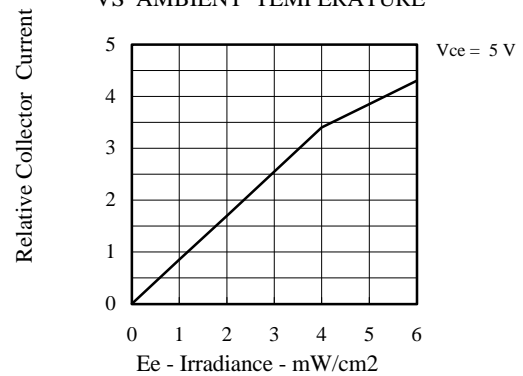
T<sub>A</sub> - Ambient Temperature -  
**FIG.1 COLLECTOR DARK CURRENT VS AMBIENT TEMPERATURE**



T<sub>A</sub> - Ambient Temperature -  
**FIG.2 NORMALIZED COLLECTOR CURRENT VS AMBIENT TEMPERATURE**



R<sub>L</sub> - Load Resistance - KΩ  
**FIG.3 RISE AND FALL TIME VS LOAD RESISTANCE**



E<sub>e</sub> - Irradiance - mW/cm<sup>2</sup>  
**FIG.4 RELATIVE COLLECTOR CURRENT VS IRRADIANCE**