

TYPE
NAME

PD700A7

DESCRIPTION

PD7XX7 is an InGaAs pin photodiode having a light receiving diameter of $40\mu\text{m}$, which is suitable for receiving the light having a wavelength band of 1000 to 1600nm. This photodiode features a high quantum efficiency and a very small dark current is suitable for the light receiving element for long-distance optical communications.

FEATURES

- High quantum efficiency
- Very small dark current
- High speed response
- Active diameter $40\mu\text{m}$
- Wavelength range 1000~1600nm
- High reliability, long operation life

APPLICATION

Fiber-optic communication systems

ABSOLUTE MAXIMUM RATINGS

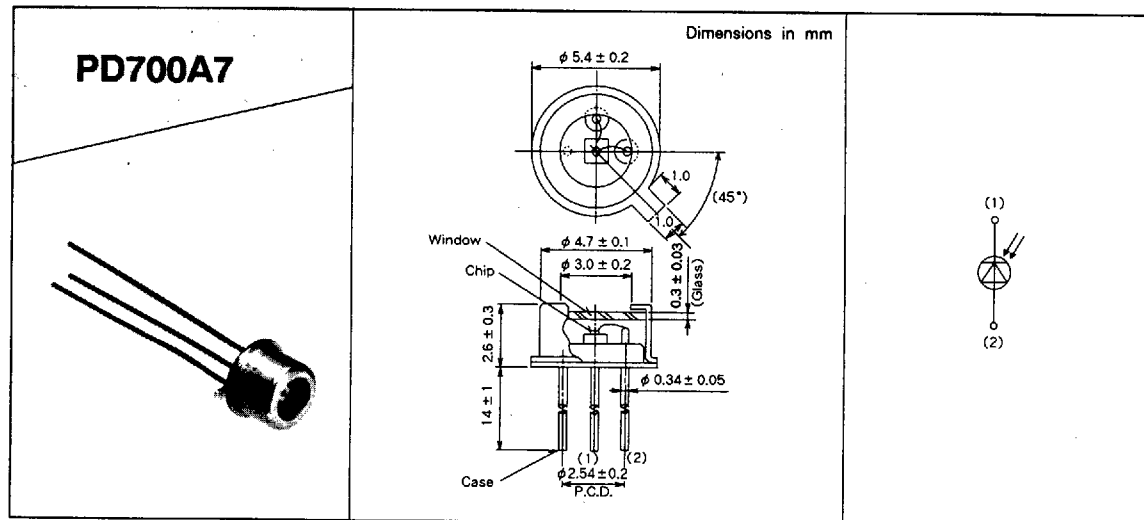
Symbol	Parameter	Conditions	Ratings	Unit
V_R	Reverse voltage	—	20	V
I_R	Reverse current	—	500	μA
I_F	Forward current	—	2	mA
T_C	Case temperature	—	$-30\sim+80$	$^{\circ}\text{C}$
T_{stg}	Storage temperature	—	$-40\sim+100$	$^{\circ}\text{C}$

ELECTRICAL/OPTICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
C_t	Total capacitance	$V_R = 5\text{V}, f = 1\text{MHz}$	—	0.6	1	pF
I_D	Dark current	$V_R = 5\text{V}$	—	0.05	0.3	nA
R	Responsivity	$V_R = 5\text{V}, \lambda = 1300\text{nm}$	0.6	0.9	—	A/W
f_c	Cutoff frequency	$V_R = 5\text{V}, \lambda = 1300\text{nm}, R_L = 50\Omega, -3\text{dB}$	1.5	3	—	GHz
t_r, t_f	Rise and fall time	$V_R = 5\text{V}, \lambda = 1300\text{nm}, R_L = 50\Omega$	—	0.1	0.3	ns

FOR OPTICAL COMMUNICATION

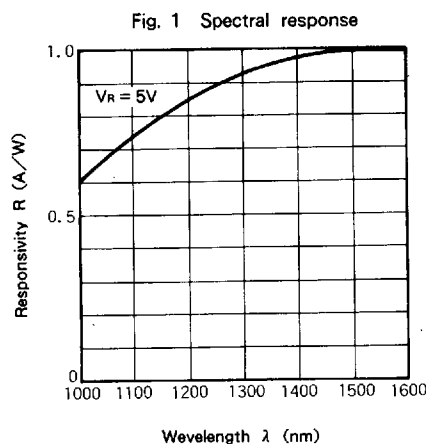
OUTLINE DRAWINGS



SAMPLE CHARACTERISTIC

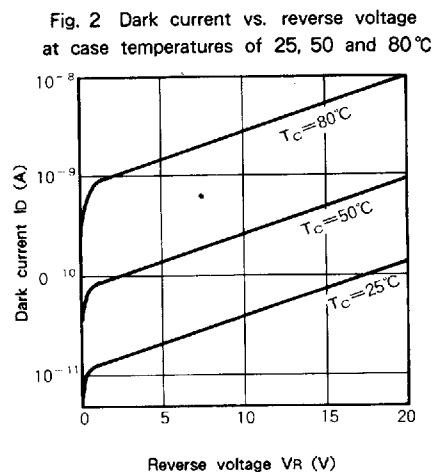
1 Spectral response

Typical spectral response at $V_R = 5V$ is shown in Fig. 1. The PD7XX7 are suitable for detection of the spectral region between 1000 and 1600nm. At a wavelength of 1300nm, the responsivity is typically about 0.9A/W.



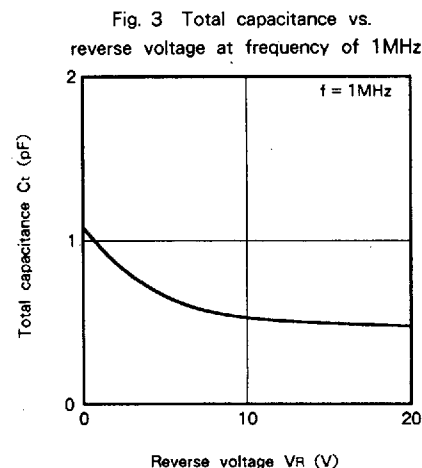
2 Dark current

Figure 2 shows PD7XX7's typical dark current vs. reverse voltage characteristics at $T_C = 25^\circ C$, $50^\circ C$, and $80^\circ C$. The dark current at $V_R = 5V$, $T_C = 25^\circ C$ is typically 50pA.



3 Total capacitance

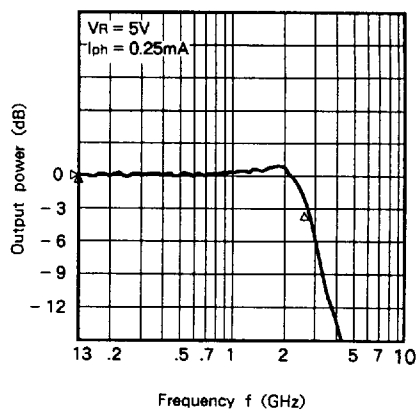
Typical capacitance vs. reverse bias characteristics are shown in Fig. 3. The total capacitance is typically 0.6pF at $V_R = 5V$.



4 Frequency response

Typical frequency response is shown in Fig. 4. For the light source, ML7XX1 ($\lambda = 1300\text{nm}$) was used. The cutoff frequency (-3dB) is typically 3GHz .

Fig. 4 Frequency response



5 Pulse response

Typical pulse response is shown in Fig. 5. Rise and fall times of about 0.1ns are typically obtained.

Fig. 5 Pulse response

