

Si PIN PHOTODIODES WITH PRE-AMPLIFIER S6468 SERIES

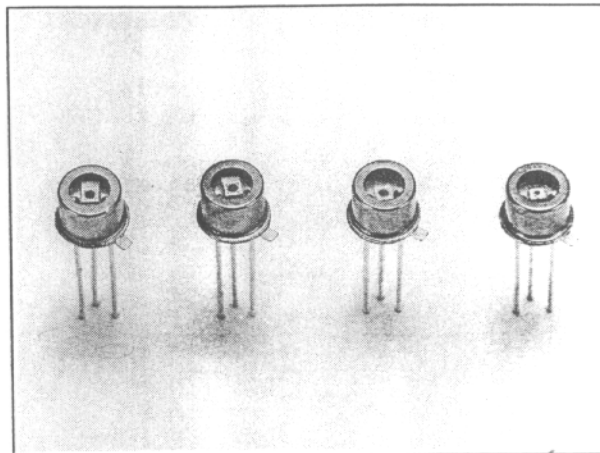
High-speed sensors with pre-amp

FEATURES

- Cut-off frequency ($V_{CC}=5\text{ V}$)
S6468: 15 MHz
S6468-02: 35 MHz
S6468-05: 50 MHz
S6468-10: 100 MHz
- Low noise ($f=1\text{ MHz}$)
S6468: 25 nVrms/Hz^{1/2}
S6468-02: 28 nVrms/Hz^{1/2}
S6468-05: 26 nVrms/Hz^{1/2}
S6468-10: 16 nVrms/Hz^{1/2}
- 3 pin TO-18 package
- Active area:
S6468, -02, -05: $\phi 0.8\text{ mm}$
S6468-10: $\phi 0.4\text{ mm}$

APPLICATIONS

- Optical fiber communication
- Video signal transmission
- Optical disk pick-up



■ OPTICAL AND ELECTRICAL CHARACTERISTICS [$T_a=25^\circ\text{C}$, $V_{CC}=5\text{ V}$, $R_L=500\ \Omega$, $C_L=13\text{ pF}$ (S6468-05/-10: $C_L=3\text{ pF}$)]¹

Parameter	Symbol	Condition	S6468			S6468-02			S6468-05			S6468-10			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral Response Range	λ		320 to 1000			320 to 1000			320 to 1000			320 to 1000			nm
Peak Sensitivity Wavelength	λ_p		-	900	-	-	800	-	-	800	-	-	800	-	nm
Photo Sensitivity	S	$\lambda=680\text{ nm}$	-	13.5	-	-	8.5	-	-	7.5	-	-	4.5	-	mV/ μW
		$\lambda=780\text{ nm}$	-	15.5	-	-	11	-	-	9.5	-	-	5	-	mV/ μW
		$\lambda=830\text{ nm}$	-	16.5	-	-	11	-	-	9.5	-	-	5	-	
Trans-impedance	R_T		-	30	-	-	20	-	-	18	-	-	10	-	k Ω
Power Supply Current	I_{CC}	$R_L=\infty$	-	-	3	-	-	3	-	-	6.5	-	-	18	mA
Output Bias Voltage *2	V_O	$R_L=\infty$ $P_{in}=0\ \mu\text{W}$	0.55	0.65	0.8	0.65	0.8	0.9	1.25	1.55	1.85	1.1	1.4	1.8	V
Temperature Coefficient of Output Bias Voltage	-		-	-2	-	-	-2	-	-	-4	-	-	-3	-	mV/ $^\circ\text{C}$
Cut-off Frequency	f_c	$P_{in}=10\ \mu\text{W}$ ³	12	15	-	28	35	-	40	50	-	80	100	-	MHz
Maximum Output Voltage Amplitude	-	Nonlinear Distortion: 10 % Max.	0.5	-	-	0.5	-	-	1.0	-	-	0.8	-	-	Vp-p
Output Impedance	Z_O	$f=5\text{ Hz}$	-	30	-	-	30	-	-	17	-	-	17	-	Ω
Output Noise Voltage	V_n	$P_{in}=0\ \mu\text{W}$ $f=1\text{ MHz}$	-	25	-	-	28	-	-	26	-	-	16	-	mV $^{1/2}$
Overshoot	-	$P_{in}=10\ \mu\text{W}$ ³	-	-	10	-	-	10	-	-	10	-	-	10	%

■ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage *4	V_{CC}	-0.5	7	V
Power Dissipation	P	-	300	mW
Operating Temperature	T_{opr}	-20	70	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40	100	$^\circ\text{C}$

■ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	S6468/-02			S6468-05/-10			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	4.75	5	5.25	4.75	5	5.25	V
Load Resistance	R_L	500	-	-	500	-	-	Ω
Load Capacitance	C_L	-	-	13	-	-	3	pF
Operating Temperature	T_{opr}	0	-	60	0	-	60	$^\circ\text{C}$

*1: For definitions of R_L and C_L , refer to the basic connection in figure 5.

*2: Output voltage $V_O = V_O - (P_{in} \times S)$ P_{in} : incident radiant flux (μW)

*3: Peak value

*4: A bypass capacitor (0.01 μF to 0.1 μF ceramic) is connected between the V_{CC} lead and the GND lead. The lead length should be less than 20 mm (S6468/-02) or 5 mm (S6468-05/-10).

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Figure 1: Spectral Response

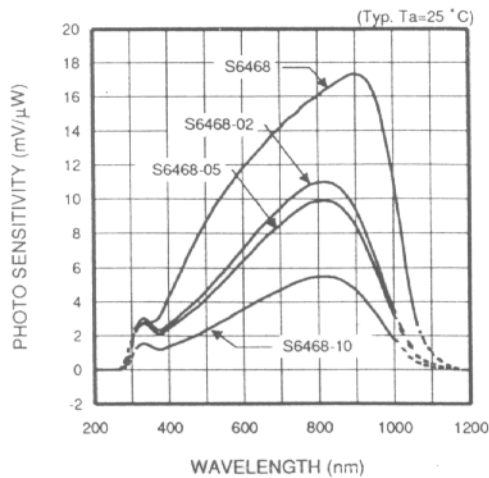


Figure 2: Frequency Characteristics

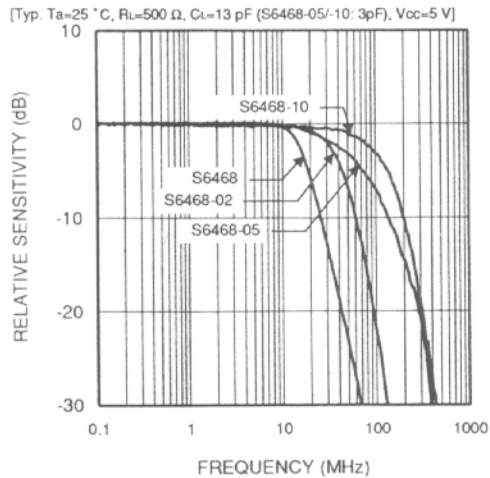


Figure 3: Output Noise Spectrum

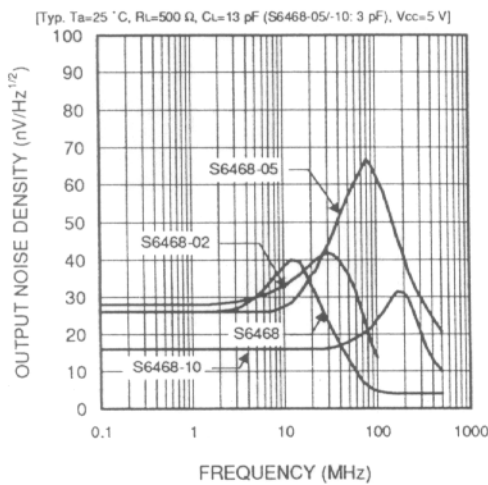
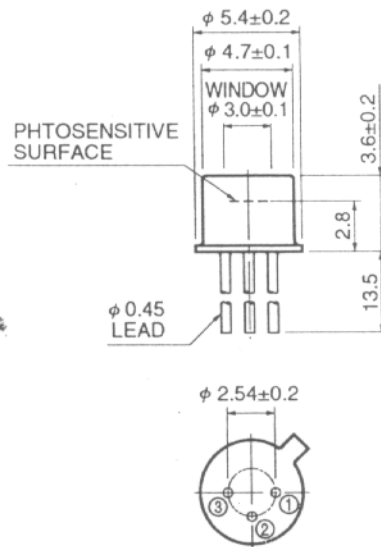


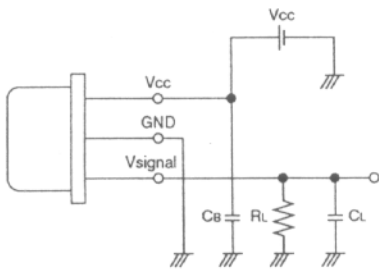
Figure 4: Dimensional Outlines (Unit: mm)



- ① Vcc
- ② GND (CASE)
- ③ V signal

KPINAD001EB

Figure 5: Basic Connection



KPINC0001JA

Note: R_L and C_L are total resistive load and capacitive load viewed from the Vsignal terminal. They should be used in accordance with the recommended operating conditions: $R_L \geq 500 \Omega$ and $C_L \leq 13 \text{ pF}$ (S6468-05/-10: $C_L \leq 3 \text{ pF}$).

A bypass capacitor ($C_B = 0.01 \mu\text{F}$ to $0.1 \mu\text{F}$ ceramic) is connected between the Vcc lead and the GND lead.

The lead length should be less than 20 mm (S6468/-02) and 5 mm (S6468-05/-10).

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