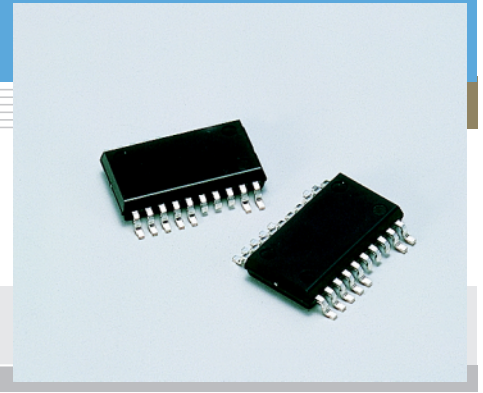


Si PIN photodiode with preamp

S5905-02

High-speed photosensor with built-in preamplifier



S5905-02 is a high-speed, high sensitivity photosensor consisting of a large area PIN photodiode and a preamplifier, sealed in a visible-cut plastic package almost impervious to adverse effects from background disturbance light.

Features

- Active area: 2.77×2.77 mm
- Preamplifier bandwidth: 25 MHz Typ.
Trans-impedance: 30 k Ω Typ.
- Visible-cut plastic package (5.2×9.5 mm)

Applications

- Spatial light transmission

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit	Note
Reverse voltage	V _R	15	V	Photodiode
Supply voltage	V _{CC}	-0.5 to +15	V	Preamplifier
Power dissipation *1	P	150	mW	
Operating temperature	T _{opr}	-20 to +70	°C	
Storage temperature	T _{stg}	-40 to +100	°C	
Soldering	-	230 °C, 5 s	-	

*1: Derate power dissipation at a rate of 1.65 mW/°C above Ta=25 °C

■ Electrical and optical characteristics (photodiode, Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	760 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	960	-	nm
Photo sensitivity	S	$\lambda=900$ nm	0.6	0.65	-	A/W
Dark current	I _D	V _R =12 V	-	0.2	10	nA
Cut-off frequency	f _c	V _R =12 V, R _L =50 Ω $\lambda=830$ nm, -3 dB	10	16	-	MHz
Terminal capacitance	C _t	V _R =12 V, f=1 MHz	-	16	30	pF

■ Electrical characteristics (preamplifier, Ta=25 °C, V_{CC}=12 V, R_L=500 Ω , C_L=20 pF)

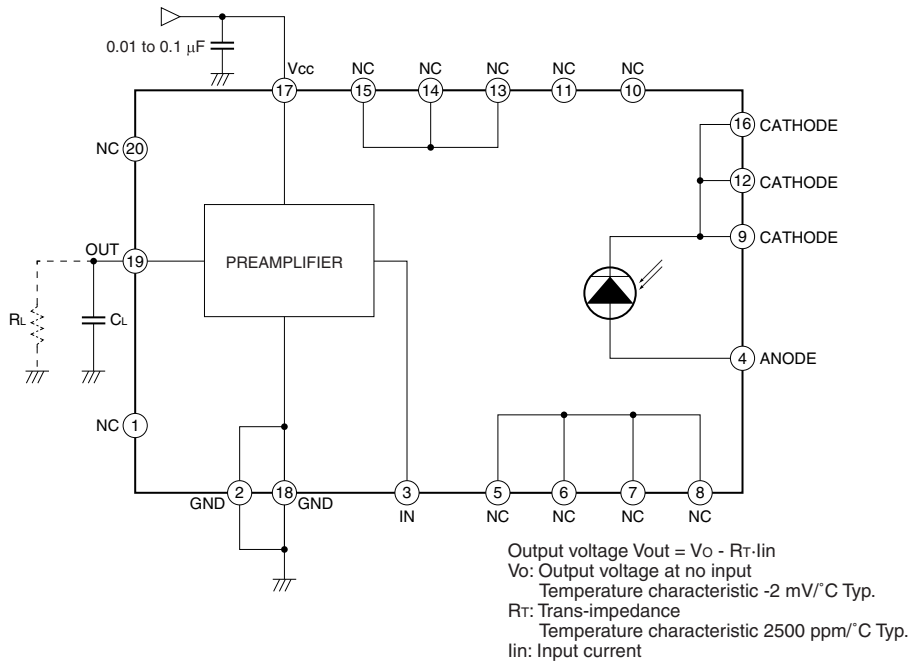
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Trans-impedance	R _T		24	30	36	k Ω
Current consumption	I _{CC}	I _{in} =0, R _L = ∞	-	-	3	mA
Output voltage at no input	V _O	I _{in} =0	0.6	0.7	0.85	V
Cut-off frequency	f _c	I _{in} =5 μ A _{p-p}	20	25	-	MHz
Maximum input current	I _{in}		-15	-	-	μ A
Equivalent input noise current	I _n	I _{in} =0, f=25 MHz	-	1.3	-	pArms/Hz ^{1/2}

■ Operating condition (preamplifier, Ta=25 °C)

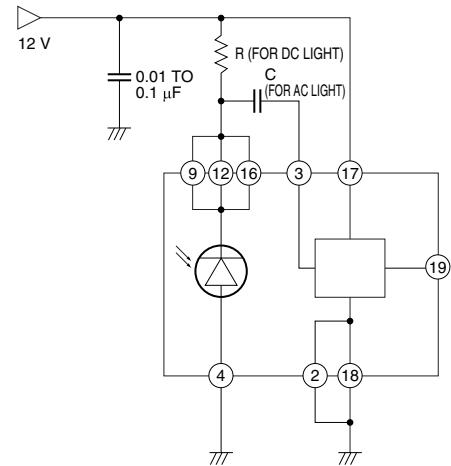
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage *2	V _{CC}		11	12	13	V
Load resistance	R _L		500	-	-	Ω
Load capacitance	C _L		-	20	-	pF

*2: A bypass capacitor (0.01 to 0.1 μ F ceramic capacitor) is connected between the V_{CC} and GND leads. The lead length should be less than 20 mm.

■ Block diagram



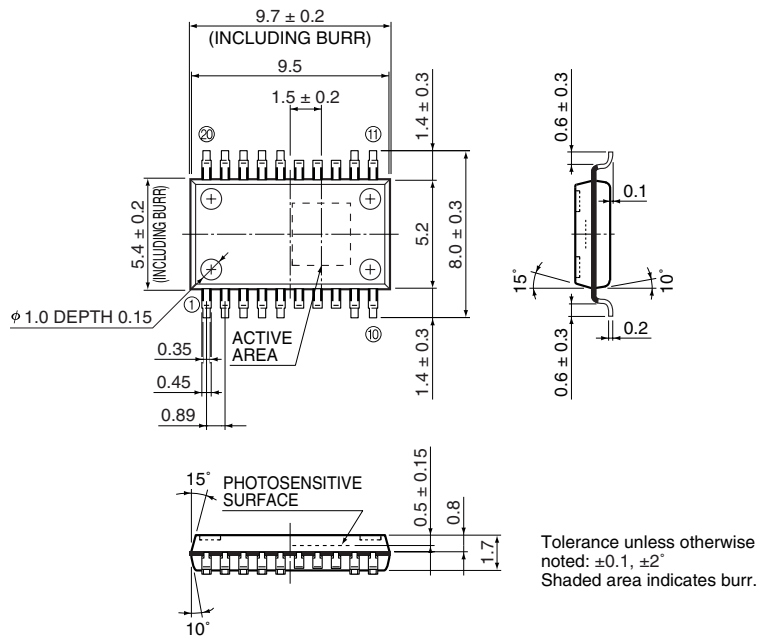
■ Application example (for DC light detection)



KPINC0011EA

KPINC0059EA

■ Dimensional outline (unit: mm)



KPINA0054EA

Pin No.	Name	Function
1	NC	No connection
2	GND	Preamplifier ground, internally connected.
3	IN	Preamplifier input terminal
4	Anode	Photodiode anode
5	NC	No connection. Internally connected.
6	NC	
7	NC	
8	NC	
9	Cathode	Photodiode cathode, internally connected.
10	NC	No connection
11	NC	No connection
12	Cathode	Photodiode cathode, internally connected.
13	NC	No connection. Internally connected.
14	NC	
15	NC	
16	Cathode	Photodiode cathode, internally connected.
17	Vcc	Preamplifier circuit power supply
18	GND	Preamplifier ground, internally connected.
19	OUT	Preamplifier output terminal
20	NC	No connection

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