

R S COMPONENTS LTD

**RS
data**

Def - 14 - 1500
new RSCB 110084

T-41-67

Silicon Photodiode with integrated amplifier

Stock number 308-067

The 308-067 consists of a high silicon photodiode combined with a high gain low noise amplifier in a T05 package. It is designed particularly for use where accurate measurements are needed of low light levels, and medium speed variation in such light levels. Its small size and excellent temperature coefficients make it ideally suited for use under adverse conditions. The 308-067 is blue sensitivity optimised and is therefore ideal for general purpose visible light detection.

Any supply voltage between $\pm 2.5V$ and $\pm 18V$ may be used. A single output line gives a voltage with respect to earth (Pin 1) proportional to the input light level, up to a maximum only slightly less than the power rail. Correction for dark level output is not normally required due to its extremely low value. The output may be short circuited to ground or either power rail without risk of damage. Changes in ambient temperature also cause only minimal variation in signal level, typically $150\mu V/^{\circ}C$.

Absolute maximum ratings

Supply voltage _____ $\pm 18V$
Output short circuit _____
Duration _____ Indefinite
Storage temperature _____ $-65^{\circ}C$ to $100^{\circ}C$
Operating temperature _____ $0^{\circ}C$ to $70^{\circ}C$

Connecting details

1. Earth
2. Output
3. V+
4. V-(Connected to can)

T05 can with 4 leads

Gold-plated leads:

12.7mm length
5mm²

Active light sensitive area:

Features

- Very high responsivity
- Linear response
- Low output impedance
- Low noise
- Rugged construction
- Excellent temperature characteristics
- Short circuit proof
- Excellent power supply noise rejection
- TTL compatible
- Simple to use

Applications include

- Light intensity measurements
- Light fluctuation detection
- Optical spectroscopy
- Pollution monitoring
- Alarm systems
- Optical shaft encoders
- Automated inspection and control
- Flow monitoring

CONNECTION DETAILS

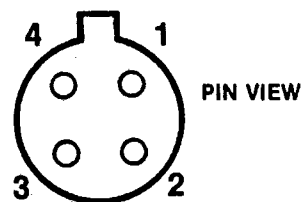
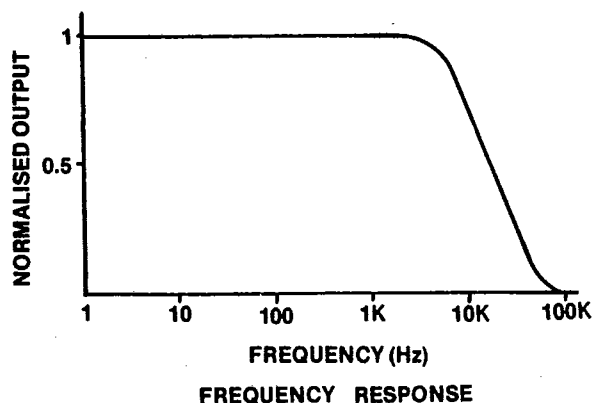
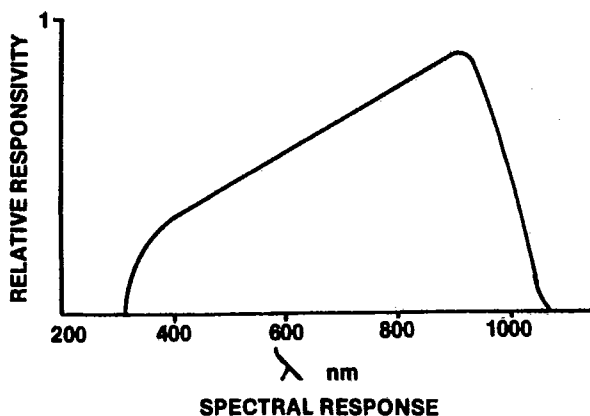


Figure 1: Spectral and frequency response





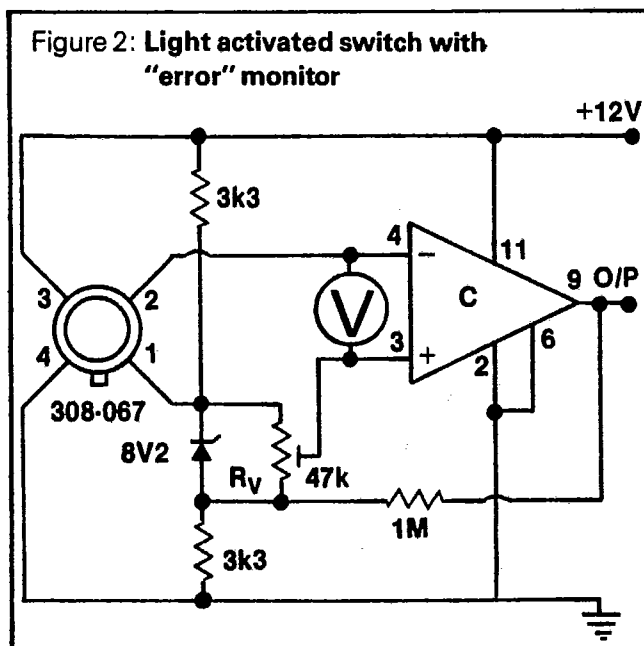
Electrical specification – All at $V_S \pm 15V$ and $25^\circ C$ unless otherwise stated.

Parameter	Conditions	Min.	Typ.	Max.	Units
O/P dark level			+20	+60	mV
O/P saturation level	$R_L \geq 2k\Omega$	-9	-12		V
O/P resistance ¹			75		Ω
O/P short circuit current			6		mA
O/P noise voltage			1	3	mV rms
Responsivity		30	60		$mV/\mu W^{-1}cm^2$
Supply voltage (V+)		2.5	15	18	V
Supply voltage (V-)		-2.5	-15	-18	V
Supply current	$R_L = \infty$		0.5	1.3	mA
Supply voltage rejection ratio		150	50		$\mu V/V$
Bandwidth	Upper 3dB point	3	5		kHz
Rise time ²	$C_L = 0$		30	50	μs
Fall time ²	$C_L = 0$		30	50	μs
Dark level temperature coefficient	$20^\circ C \leq T_A \leq 50^\circ C$		150	500	$\mu V/^\circ C$

Notes:

1. At 5kHz. Drops to 0.01 at d.c.
2. Time for output signal to reach 90% of true reading after application of a step change in light intensity.

Application examples



Linear interfacing

In Figure 2, the comparator (e.g. RS Stock No. 305-260) will switch its output state when the light

intensity increases above a pre-set level, determined by R_V . The centre zero voltmeter registers the difference between the switching threshold intensity and the actual intensity received by the 308-067. Since the threshold is determined with respect to pin 1 of the 308-067 supply voltage variations have no effect on the operation of the circuit.

Note:- Centre zero voltmeter (RS Stock No. 259-628) requires two resistors (RS Stock No. 259-369) wired in series.

