

High Speed Integrated Photodiode Amplifiers

(Frequencies up to 20MHz) with 50Ω drive capability

The IPL range of sensitive photo-amplifiers is made up of PIN photodiodes integrated with fast bipolar input op-amps and packaged into four-pin TO5 window packages. The hybrid integration technology used provides an easy solution to achieve **fast, low noise** performance in both **visible** and **IR** measurement and detection applications.

These high speed amplifiers provide good sensitivity at high frequencies and are suitable for waveform and edge detection.

In this family of products, speed of response is determined by discrete components and as a result it is possible to tailor specifications for components to meet **customer requirements** in relatively small manufacturing batches.

These versions are available with plain windows or lensed versions. The lensed version are highly directional and have an additional on-axis sensitivity factor of approximately ten. Any of these devices can be supplied with optical filters to limit sensitivity to specified bands. Typical filters, available off-the-shelf, include "approximation to **eye response**" and **IR** band pass.

Application Notes

Customers PCB layout for these devices has been simplified by integrating within the package supply rail decoupling capacitors. However it is recommended that additional capacitors (eg. $0.1\mu\text{F}$ multilayer ceramics) be added to the PCB to minimise second order interactions that may occur in the associated circuit.

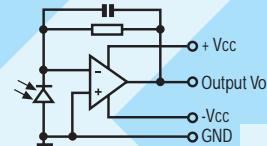
This amplifier would typically be used in **ac-coupled** applications.

IPL10537

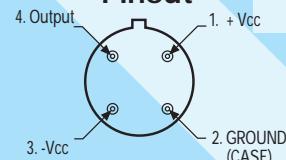
Economic fast amplifier for ac-coupled applications

Surface mount package versions available to order

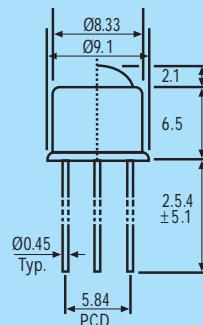
Basic Circuit



Pinout



Dimensions (mm)



All characteristics are typical values at 25°C. IPL reserves the right to change the product shown on this leaflet in the interests of improving specification. No responsibility is assumed for the use of information contained herein, nor for any infringement of patent or rights of others which may result from such use. No licence is granted by implication or otherwise under any patent or patent right of Integrated Photomatrix Limited or others.

Product Data

Typical Characteristics @ 25°C

PARAMETER	UNITS	20MHz	15MHz	10MHz
DC Supply Voltage (Dual Rail) Vcc	V	±5V to ±15V	±5V to ±15V	±5V to ±15V
Quiescent Current	mA	20	20	20
Max continuous output Current 3	mA RMS	33	33	33
Saturation @ High Light Level	V	10	10	10
Detector Frequency Response Small Signal (Vout = 10mV p-p)	MHz	22	16	10
Detector Frequency Response Large Signal (Vout = 2V p-p)	MHz	22	16	10
Detector Output Offset (typ) ²	mV	-100	-150	-200
Detector Output Offset (typ) with Temperature	mV	-120	-170	-240
Dark Level Noise (RMS) full BW ⁴	mV	320	350	360
Sensitivity @ 880nm ¹	mV(W ⁻¹ mm ⁻¹)	25	37	130
Responsivity @ 880nm ¹	mV(W ⁻¹)	100	150	200
Step Response 10% - 90% @ 1V	nS	16	25	35
Rise Time	nS	16	25	35
Fall Time	nS	16	25	35
Step Response 10% - 90% @ 10mV	nS	16	25	35
Temperature Range	°C	-20 to +80	-20 to +80	-20 to +80
Operating	°C	-30 to +100	-30 to +100	-30 to +100
Storage	°C	-30 to +100	-30 to +100	-30 to +100
Photodiode Active Area	(mm) ²	0.25	0.25	0.66

Filter Options

Eye response (BG18) or N.I.R. Bandpass (RG850) Many other options are available upon request.

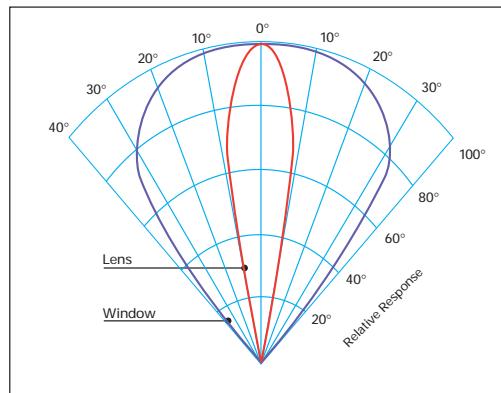
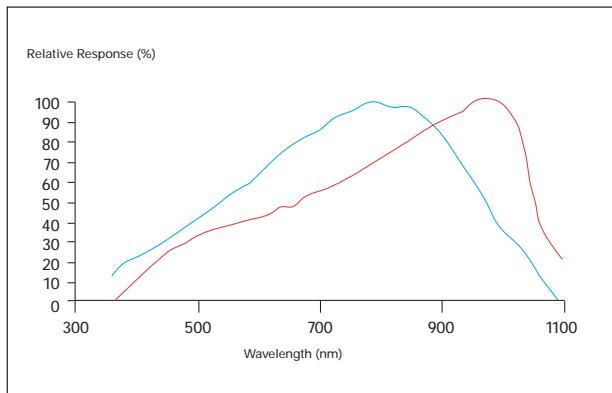
Notes

¹ Figures apply to on-axis sensitivity of version with lens, for plain window version divide by factor of 10.

² Maximum offset is 0.5 V but is trimmable.

³ O/P impedance is 30Ω, device will deliver 1Vp-p into 50Ω and will withstand momentary S/C to ground.

⁴ Noise measured over 20MHz bandwidth at amplifier output.



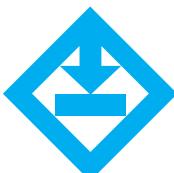
Responsivity can be estimated from graph above.

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