

HIGH SPEED SILICON DETECTOR/PREAMPLIFIER

This series of silicon PIN integrated receivers are designed for high speed, for both the digital and analog user. These flexible and versatile devices are used in video, computer and instrumentation applications. The detectors proportionately convert an input optical signal to a linear voltage signal.

Featuring a large 850nm enhanced detector active area (0.85mm^2), these receivers exhibit an excellent signal-to-noise ratio. The use of fully integrated and internally tuned feedback resistors allow for standard bandwidth selections of 6.5, 20, 60 and 100MHz, with custom bandwidths available for OEM customers. These receivers are packaged in hermetically sealed cases, with separate case ground leads, and have a very high immunity to RF pickup. It should be noted that for proper operation, the device must be capacitively coupled to the next stage of electronics.

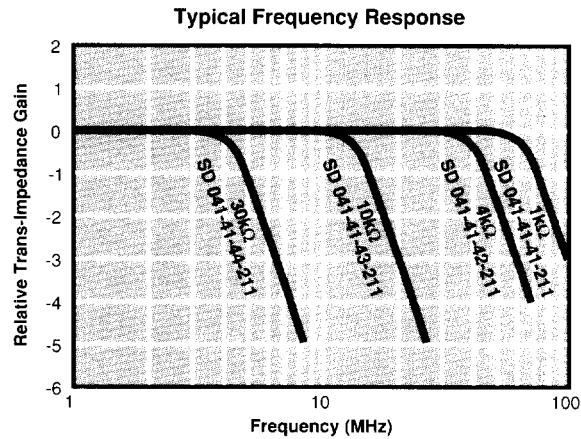
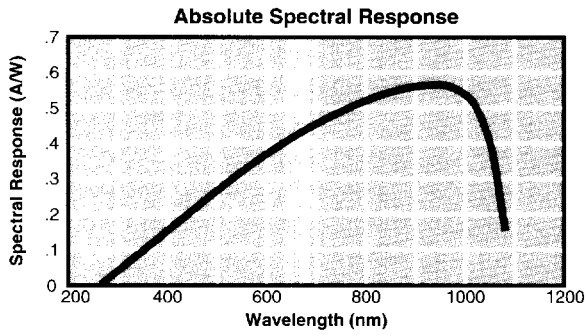
SPECIFICATIONS

Photodiode Bias:	-5 to -50V	Dynamic Range ($10\log V_n/V_m$):	40dB
Output Voltage Amplitude: (Nonlinear distortion at 10%)	1.4V @ 6V 3.5V @ 10V 4.5V @ 15V	Amplifier Power Supply Voltage:	4V min., 18V max.
Output Offset Voltage ($P_o=0$):	0.8V	Operating Temperature:	-20°C to 80°C
Output Impedance ($f=5\text{MHz}$):	25Ω	Storage Temperature:	-40°C to 100°C
Amplifier Power Supply Current:	4mA	Load Impedance:	50Ω typical

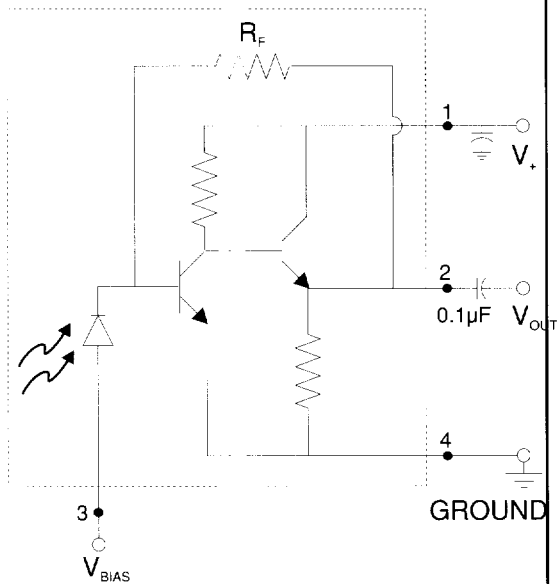
Part Number	Active Area	Cutoff Frequency (-3dB)	Rise/Fall Time	Sensitivity	Transimpedance Gain	Broadband Noise	NEP
	(in)	$P_o=10\mu\text{W peak}$ (MHz)	$P_o=10\mu\text{W peak}$ (ns)	$\lambda=850$ (V/W)	(k-Ohm)	BW=15MHz ($\mu\text{V rms}$)	$\lambda=850$ ($\text{W}/\sqrt{\text{Hz}}$)
SD 041-41-41-211	0.040 x 0.033	100	3.5	540	1	70	29×10^{-12}
SD 041-41-42-211	0.040 x 0.033	35	10	2200	4	80	8.4×10^{-12}
SD 041-41-43-211	0.040 x 0.033	18	20	5400	10	80	3.2×10^{-12}
SD 041-41-44-211	0.040 x 0.033	6.5	55	16200	30	150	3.0×10^{-12}

Test conditions: $V_{cc}=6\text{V}$, $V_R=-50\text{V}$, $T=23^\circ\text{C}$

For extremely low light level applications, API can combine a high frequency avalanche photodiode with a discrete amplifier circuit to produce the lowest noise, high speed detection system available. NEP values as low as $6\text{fW}/\sqrt{\text{Hz}}$ at 850nm and 20°C, and a responsivity of $4.5\text{MV}/\text{W}$ at 10MHz can be achieved with a 0.3mm APD and a discrete transimpedance amplifier. Speeds as high as 350MHz can be obtained by optimizing the circuit.



Circuit Schematic



Circuit Schematic

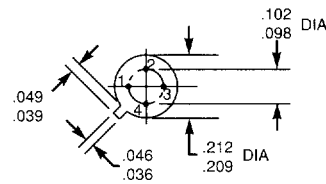
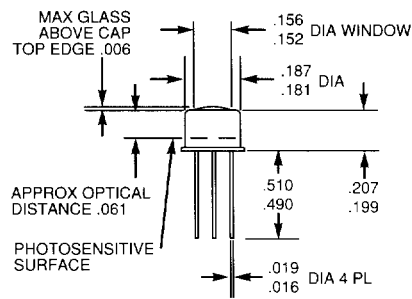
Note: Components shown outside the dashed area are external to the device, and must be supplied by the user.

SD 041-41-41-211

SD 041-41-42-211

SD 041-41-43-211

SD 041-41-44-211



BOTTOM VIEW