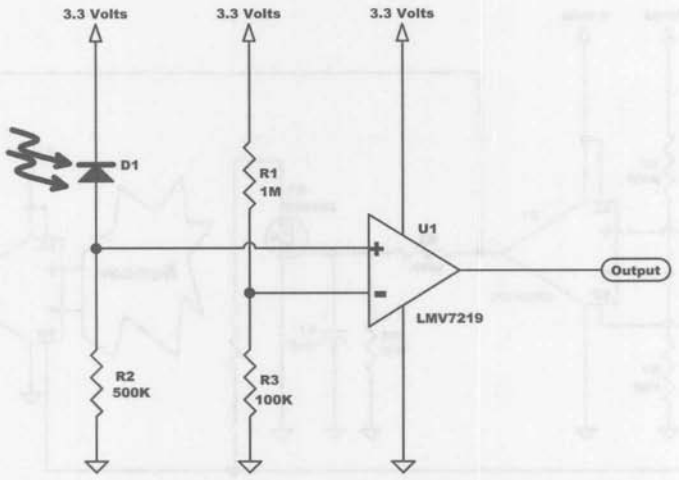
Photodiode Comparator Application



National Semiconductor

This application uses a low-power comparator, the LMV7219, to sense the output of a photodiode amplifier. Infra-red light falls on the photodiode D1, generating reverse bias current. The R1/R3 ladder creates a 0.3 volts reference level at the inverting input. Consequently, when the photodiode reverse current reaches 0.6 microamperes the comparator switches. The fundamental limitation of this circuit relative to the other photodiode amplifiers in this seminar is speed. Since the photodiode is not looking into a virtual ground the voltage across it is changing as the photo-current changes across R2. The capacitance of the photodiode fights this changing voltage and limits the speed the circuit can toggle at. This simple circuit can be useful when there is a controlled IR source and speeds are under 1MHz. The 1.1 milliampere supply current of the LMV7219 is fairly low especially in view of the 7 nanosecond propagation delay but may be too high for battery powered circuits. Other lower-power, lower-speed comparators could be substituted.