



## Precision Low Level Voltage Detector/Comparator

### Description

This circuit utilizes a rail-to-rail precision operational amplifier with high slew rate to act as a precision voltage comparator. The input reference level is adjusted from V- rail to ground via  $R_1$ . Note that this input reference level is ratiometric with the supply voltage. The output changes state whenever the input signal  $V_{IN}$  at the +input terminal crosses the reference voltage at the -input terminal. A high-precision voltage comparator function can be implemented by selecting a low offset voltage rail-to-rail operational amplifier. This circuit is suitable for very low level input signals from a ground reference, high gain requiring high ratio of  $R_2/R_1$ . Start this component selection process by first determining the available voltage supplies, the comparator response time required, power dissipation budget, and the offset voltages required. This selection process can then be narrowed down to selecting an operational amplifier with very high input impedance (a few pA input currents), such that the input of the operational amplifier would not load down the power consumption of the operational amplifier itself. The input characteristics of the operational amplifier would limit  $R_1$  and  $R_2$  values that can be used. For micropower applications a high value for  $R_1$  and a low power consuming operational amplifier such as the ALD1706 could be used.

For full schematic diagram and notes, please register and login at [aldinc.com](http://aldinc.com)