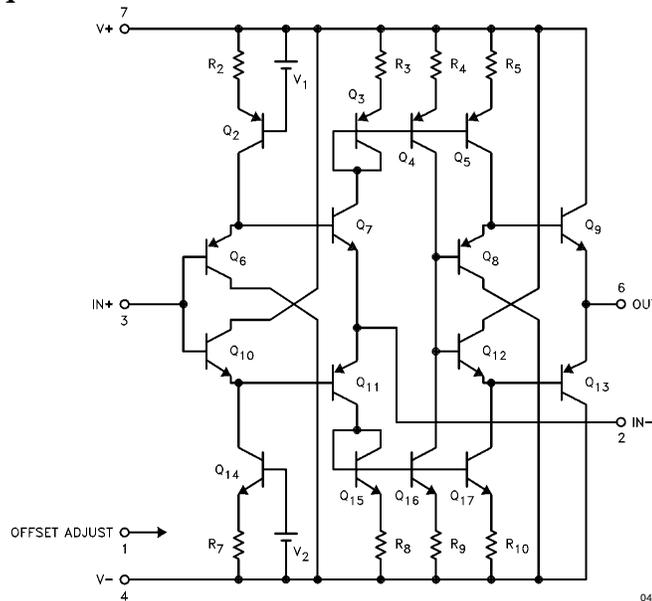


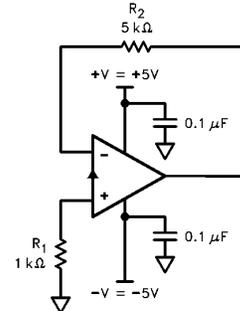
EL400C

200 MHz Current Feedback Amplifier

Equivalent Circuit



Burn-In Circuit



0400-9
ALL PACKAGES USE THE SAME SCHEMATIC.

Applications Information

Theory of Operation

The EL400 has a unity gain buffer from the non-inverting input to the inverting input. The error signal of the EL400 is a current flowing into (or out of) the inverting input. A very small change in current flowing through the inverting input will cause a large change in the output voltage. This current amplification is called the transimpedance (R_{OL}) of the EL400 [$V_{OUT} = (R_{OL}) * (-I_{IN})$]. Since R_{OL} is very large, the current flowing into the inverting input in the steady-state (non-slewing) condition is very small.

Therefore we can still use op-amp assumptions as a first-order approximation for circuit analysis, namely that:

1. The voltage across the inputs is approximately 0V.
2. The current into the inputs is approximately 0 mA.

Resistor Value Selection and Optimization

The value of the feedback resistor (and an internal capacitor) sets the AC dynamics of the

EL400. The nominal value for the feedback resistor is 250Ω, which is the value used for production testing. This value guarantees stability. For a given closed-loop gain the bandwidth may be increased by decreasing the feedback resistor and, conversely, the bandwidth may be decreased by increasing the feedback resistor.

Reducing the feedback resistor too much will result in overshoot and ringing, and eventually oscillations. Increasing the feedback resistor results in a lower -3 dB frequency. Attenuation at high frequency is limited by a zero in the closed-loop transfer function which results from stray capacitance between the inverting input and ground. Consequently, it is very important to keep stray capacitance to a minimum at the inverting input.

Differential Gain/Phase

An industry-standard method of measuring the distortion of a video component is to measure the amount of differential gain and phase error it introduces. To measure these, a 40 IRE_{PP} reference signal is applied to the device with 0V DC offset (0IRE) at 3.58 MHz for NTSC, 4.43 MHz for