

F.e.t.-input operational amplifier

For less than £1.50 this circuit offers the same input performance as the more expensive commercial units. Two f.e.t.s are used in a differential source-follower, operated at a constant source current of $200\mu\text{A}$ from Tr_1 and Tr_2 . Input leakage current is kept below 1pA by maintaining the drain-source voltages at 0.55V . This value is kept constant by Tr_3 because the input common-mode voltage changes within its -13 to $+11\text{V}$ range. Tr_4 acts as a $600\mu\text{A}$ current source, its collector current being shared equally between the f.e.t.s and Tr_3 . A constant $200\mu\text{A}$ thus flows through the $2.7\text{k}\Omega$ resistor. This current

sets the V_{DS} voltage of the f.e.t.s. A diode is used to cancel the base-emitter voltage drift of Tr_3 .

Input offset voltage should be trimmed to zero by adding a resistor in the appropriate f.e.t. source, and matching the f.e.t.s will reduce thermal drift. Common mode rejection ratio can be 94dB if a resistor of adequate value (several M Ω) is connected between one of the f.e.t. sources and ground. Input impedance of the circuit is greater than 10¹³ Ω .

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