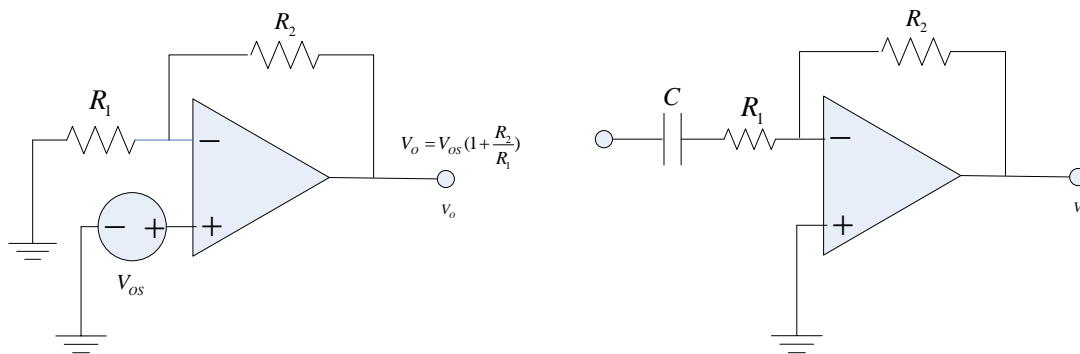


DGD3-DC Imperfections- Offset Voltage(Ref Sedra/Smith Microelectronic Circuits Six Edition)



Q1(Exercise 2.22) Consider an inverting amplifier with a nominal gain of 1000 constructed from an op amp with an input offset voltage of 3mV and with output saturation levels of $\pm 10V$.(a) What is the peak sine wave input signal that can be applied without output clipping? (b) If the effect of V_{OS} is nulled at room temperature ($25^{\circ}C$), how large an input can one now apply if :(i) the circuit is to operate at a constant temperature? (ii) the circuit is to operate at a temperature in the range $0^{\circ}C$ to $75^{\circ}C$ and the temperature coefficient of V_{OS} is $10\mu V / ^{\circ}C$?

Solution: (a) 7mV (b) 10mV, 9.5mV

Q2(Exercise 2.23)Consider the same amplifier as in Exercise 2.22- that is , an inverting amplifier with a nominal gain of 1000 constructed from an op amp with an input offset voltage of 3mV and with output saturation levels of $\pm 10V$ -except here let the amplifier be capacitively coupled as the above second figure.(a) What is the dc offset voltage at the output, and what is the peak sine wave signal that can be applied at the input without output clipping? (b) Is there a need for offset trimming?

Solutions:(a) 3mV, 10mV (b) no need for offset trimming