Abstract

An operational amplifier is one of the most commonly used components in analog and digital circuit designs. Low voltage and low power operational amplifier design has become an increasingly interesting subject as many applications switch to portable battery powered operations. The need for design techniques to allow amplifiers to maintain an acceptable level of performance when the supply voltages are decreased is immense. One of the most important features in low voltage amplifier designs is ensuring that the amplifier maintains constant behavior in the presence of rail-to-rail input common mode variations while providing a rail-to-rail output to maximize signal-to-noise ratio. As the supply voltage to a standard CMOS op-amp is reduced, the input common mode range and the output swing get reduced drastically. Special circuits have to be used to raise them up to rail-to-rail supply voltage. In this work we propose a design of a low-voltage CMOS rail-to-rail folded cascode operational amplifier to be realized in a standard 130 nm CMOS technology with 1.2V supply voltage and consumes power less than 400uW. A two stage miller compensated folded cascode op-amp has a UGB >10MHz and achieves a gain >80dB over almost full range of the common mode input voltage.
References

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