Optimalisasi fully differential operational amplifier dengan menggunakan variasi common mode feedback = Optimization of fully differential operational amplifier by using common mode feedback variation

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Abstrak

Fully differential operational amplifier memiliki beberapa kelebihan sehingga seringkali dijadikan pilihan utama dalam perencanaan rangkaian terpadu modern. Sayangnya, fully differential op-amp memiliki kelemahan utama yaitu memerlukan rangkaian umpan balik. Rangkaian umpan balik ini, atau yang biasa disebut common mode feedback, dipakai untuk mengatur keluaran tegangan common mode. Variasi topologi CMFB akan mempengaruhi karakteristik rangkaian fully differential op-amp secara keseluruhan. Dalam skripsi ini, rangkaian CMFB asli diganti dengan beberapa topologi rangkaian CMFB lain, kemudian dianalisa karakteristik DC. Topologi dengan dua differential pair menghasilkan karakteristik yang lebih baik dibandingkan dengan topologi lain. Rangkaian ini dipakai untuk mengoptimalkan rangkaian fully differential op-amp lebih lanjut. Sebagai perbandingan rangkaian op-amp dengan CMFB asli juga dioptimalisasi.

<hr>Fully differential operational amplifier has several advantages, making it the main option in the design of modern integrated circuits. Unfortunately, fully differential op-amp has a major disadvantage too. Fully differential op-amp requires an additional feedback circuit. This feedback circuit, or the so-called common mode feedback, is used to adjust the output common mode voltage. CMFB topology variations will affect circuit characteristics of a fully differential op-amp overall.

In this paper, the original CMFB circuit is replaced with some other CMFB circuit topology. Better characteristics produced by topology with two differential pairs, compared with other topologies. This circuit is used to optimize the circuit fully differential operational amplifier further. As a comparison op-amp with the original CMFB is also optimized.