

Structured Electronic Design

EE3C11

Amplifiers: voltage and current drive capability

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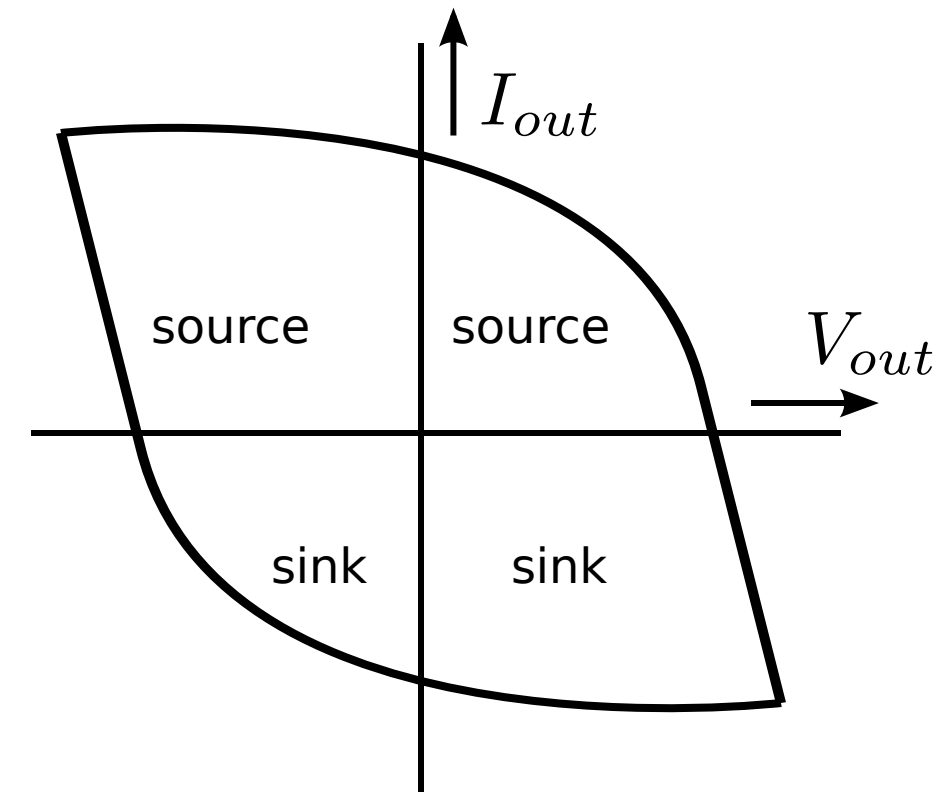
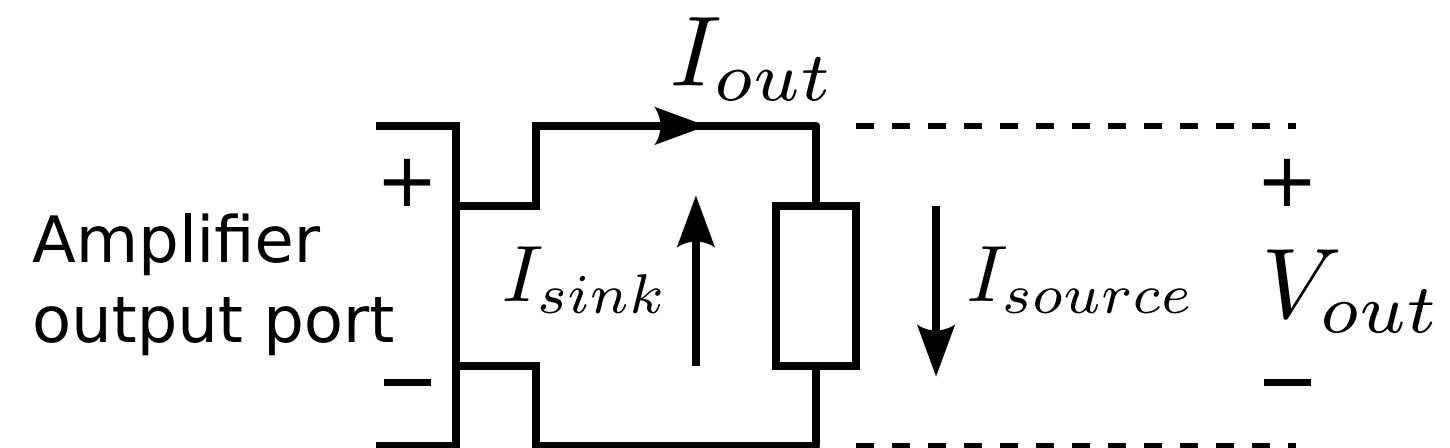
Static (DC) voltage and current drive capability

Signal excursions limited by

Power supply voltages

Breakdown mechanism

Circuit protection mechanism

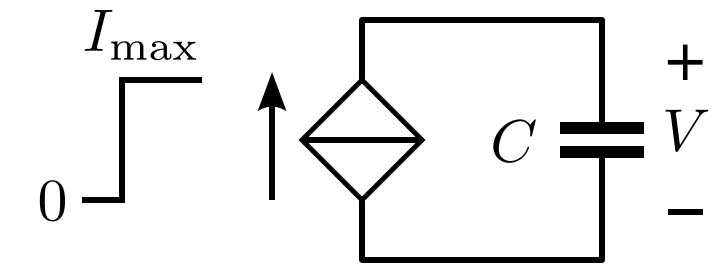


Dynamic voltage and current drive capability

Limitation of the rate of change of the signal

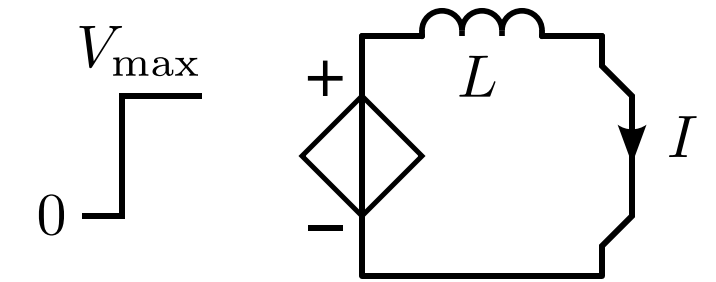
Signal current limitation and capacitance in parallel with the signal path

$$\left. \frac{dV}{dt} \right|_{\max} = \frac{I_{\max}}{C}$$



Signal voltage limitation and inductance in series with the signal path

$$\left. \frac{dI}{dt} \right|_{\max} = \frac{V_{\max}}{L}$$



Limitation of the full-power bandwidth

Maximum frequency of a sinusoidal signal of which:

peak-to-peak value equals maximum static signal swing

maximum of time derivative equals slew-rate limitation

$$f_{\text{fullPower}} = \frac{\text{SR}}{\pi A_{\max}}$$

← Maximum peak-to-peak signal swing
← Slew-rate limitation

