

Structured Electronic Design

Amplifiers: voltage and current drive capability

Static (DC) voltage and current drive capability

Static (DC) voltage and current drive capability

Signal excursions limited by:

Static (DC) voltage and current drive capability

Signal excursions limited by

Power supply voltages

Static (DC) voltage and current drive capability

Signal excursions limited by

Power supply voltages

Breakdown mechanism

Static (DC) voltage and current drive capability

Signal excursions limited by

- Power supply voltages

- Breakdown mechanism

- Circuit protection mechanism

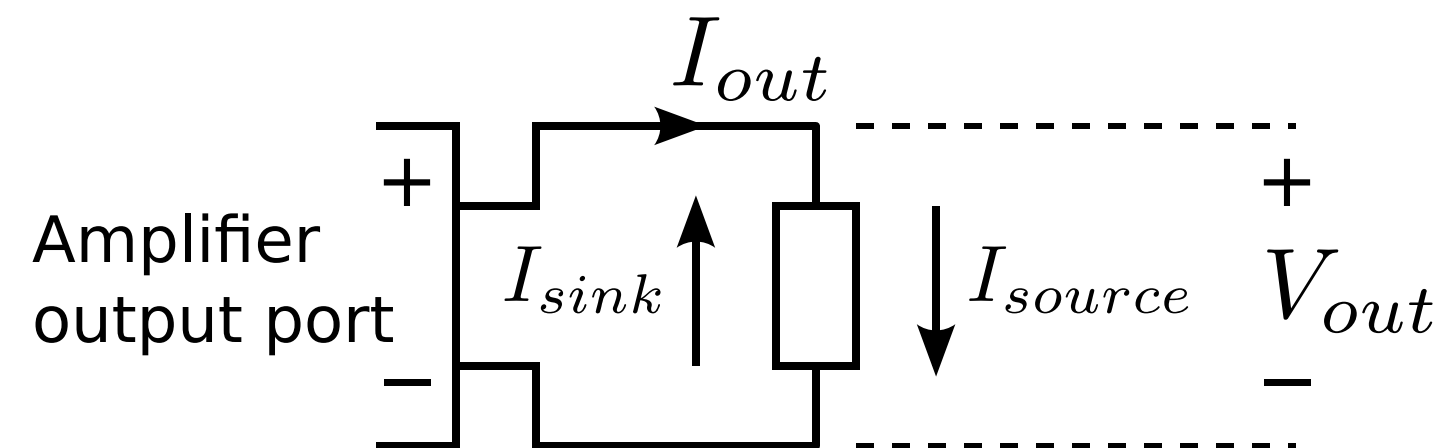
Static (DC) voltage and current drive capability

Signal excursions limited by

Power supply voltages

Breakdown mechanism

Circuit protection mechanism



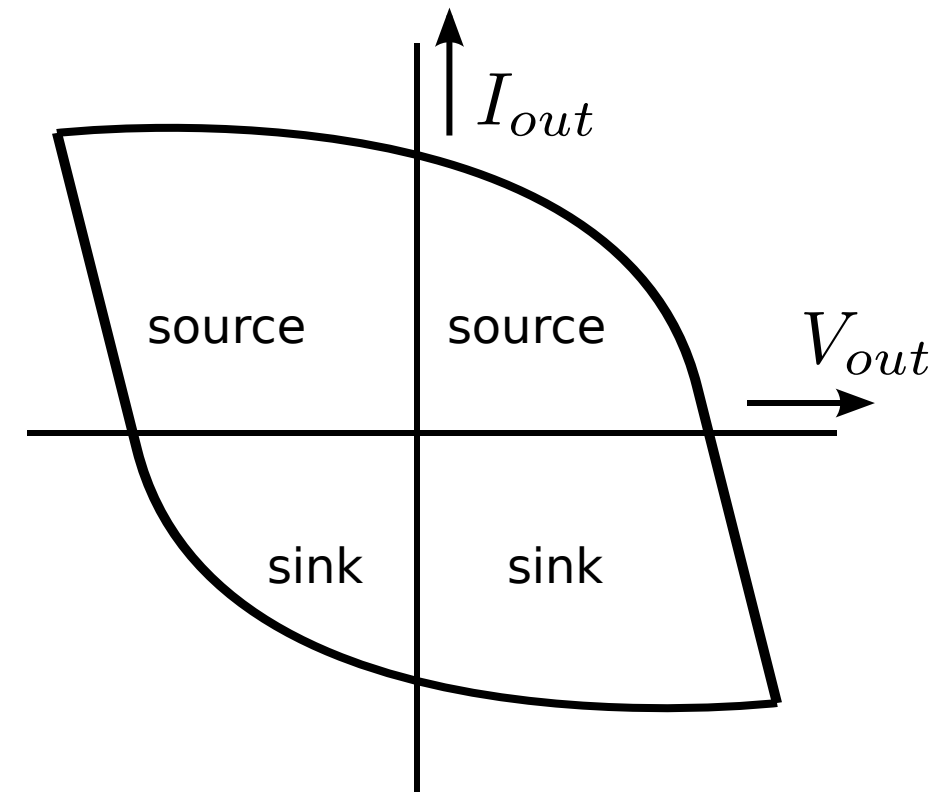
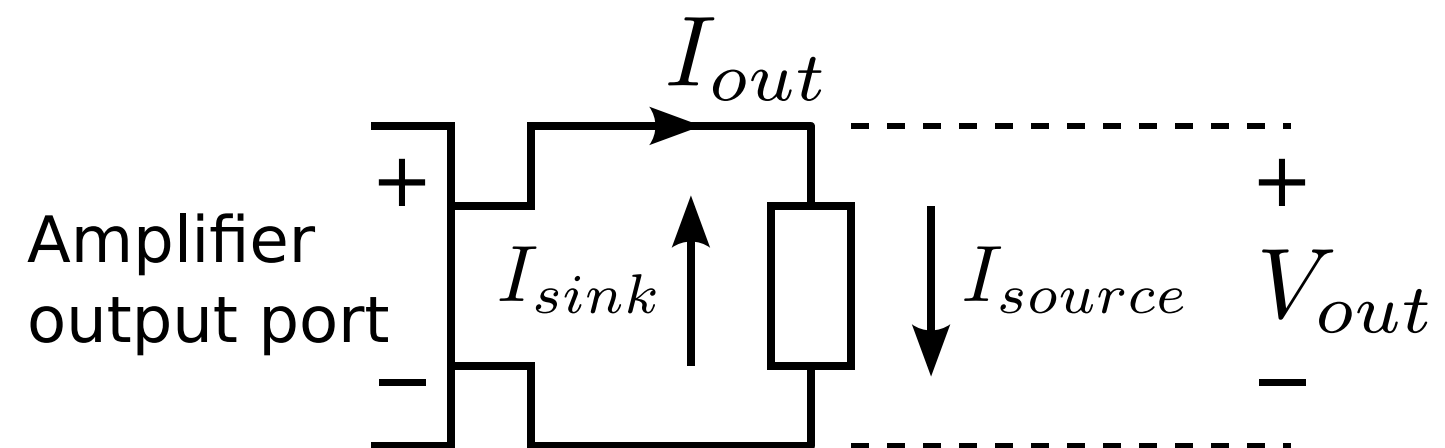
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Dynamic voltage and current drive capability

Dynamic voltage and current drive capability

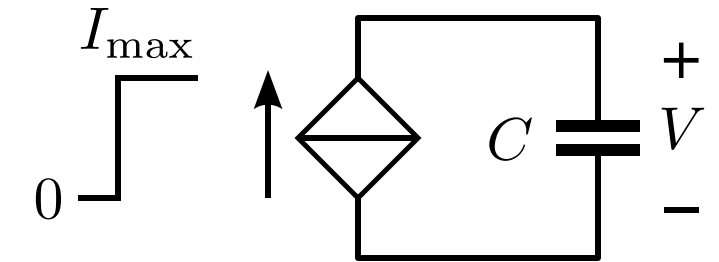
Limitation of the rate of change of the signal

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

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

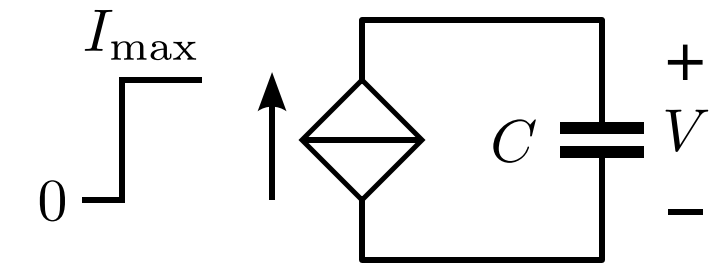


Dynamic voltage and current drive capability

Limitation of the rate of change of the signal

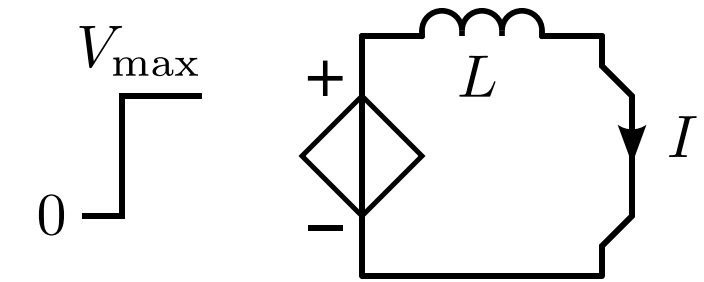
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Signal voltage limitation and inductance in series with the signal path

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

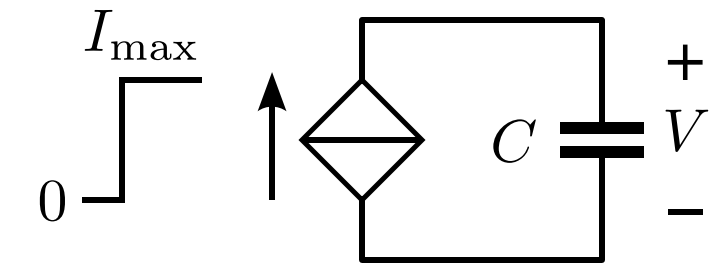


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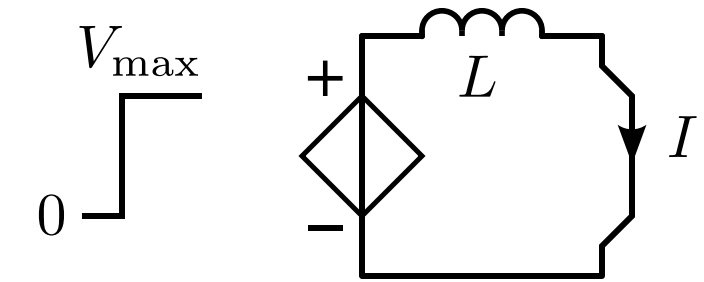
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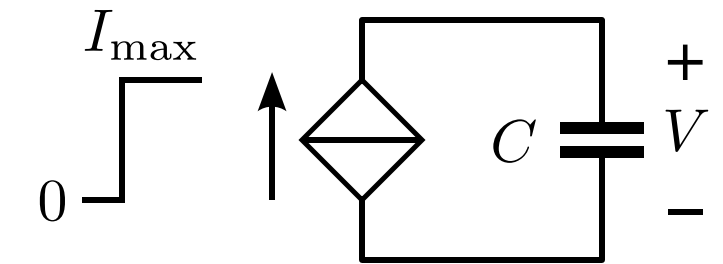
Limitation of the full-power bandwidth

Dynamic voltage and current drive capability

Limitation of the rate of change of the signal

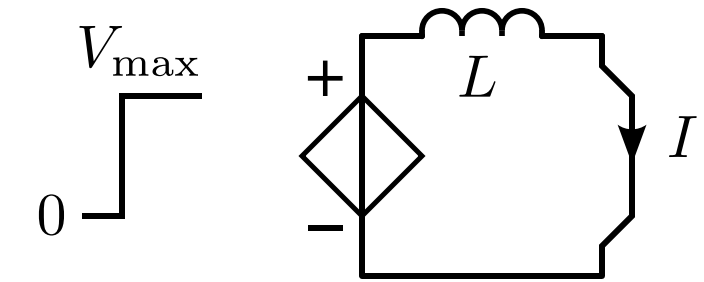
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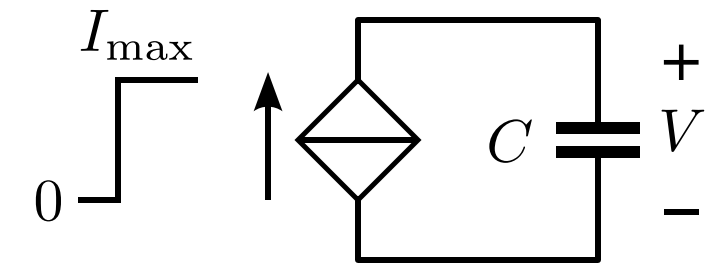
Maximum frequency of a sinusoidal signal of which:

Dynamic voltage and current drive capability

Limitation of the rate of change of the signal

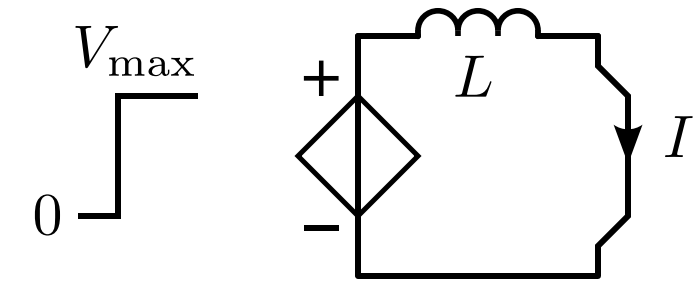
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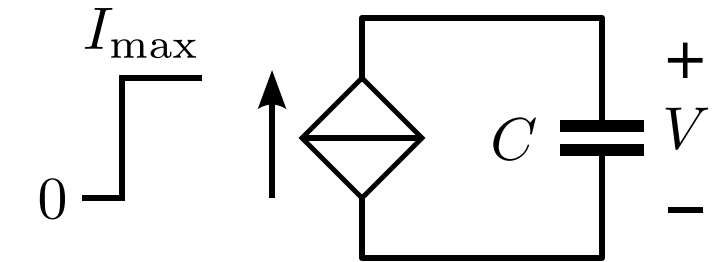
peak-to-peak value equals maximum static signal swing

Dynamic voltage and current drive capability

Limitation of the rate of change of the signal

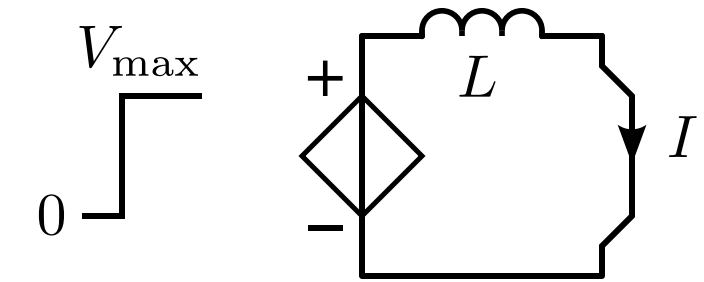
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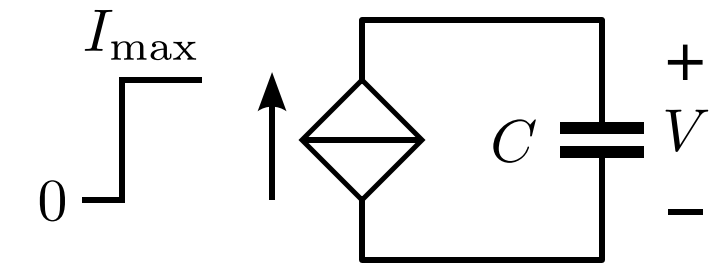
maximum of time derivative equals slew-rate limitation

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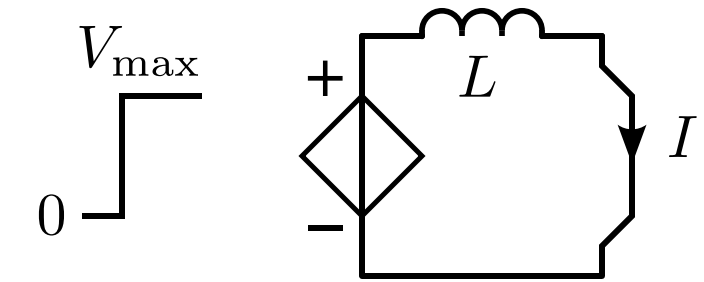
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Limitation of the full-power bandwidth

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

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

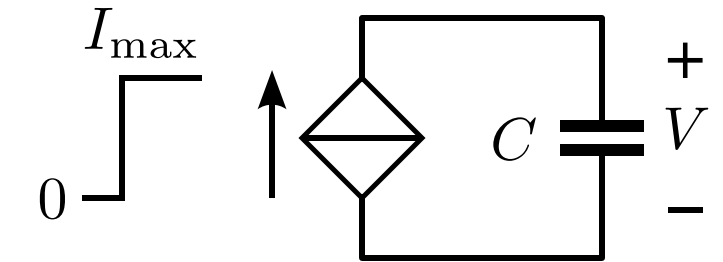
← Maximum peak-to-peak signal swing
← Slew-rate limitation

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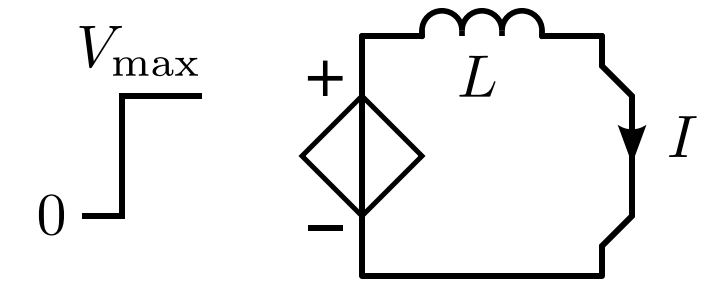
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