Structured Electronic Design

EE3C11
Amplifiers: voltage and current drive capability

Anton J.M. Montagne

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

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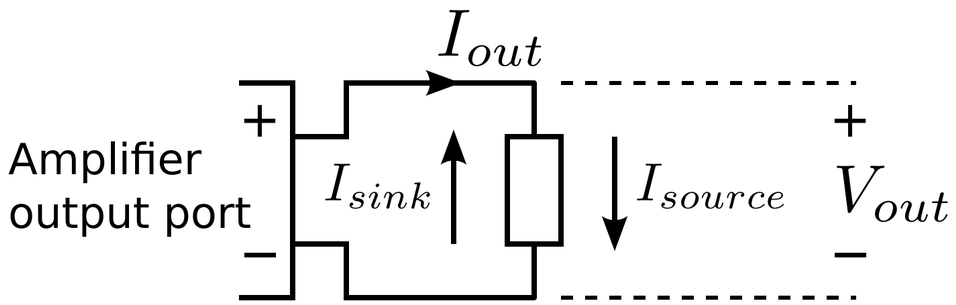

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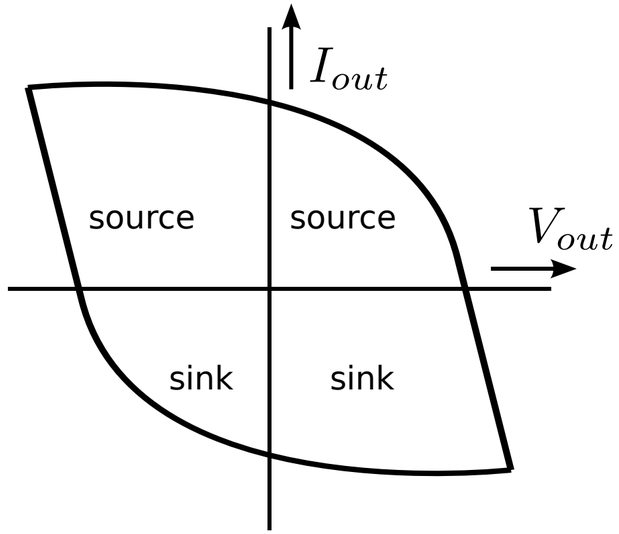
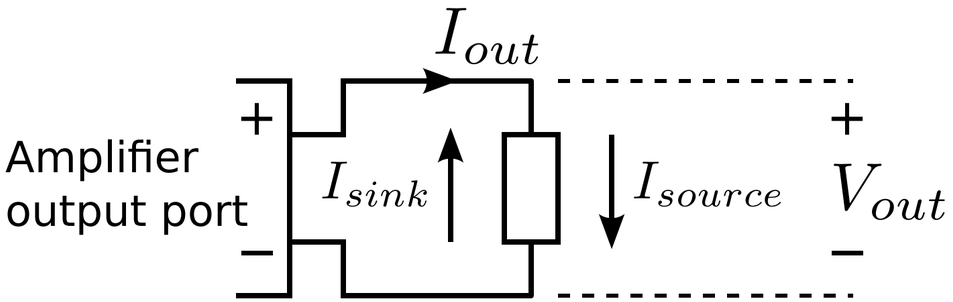




Dynamic voltage and current drive capability

Dynamic voltage and current drive capability

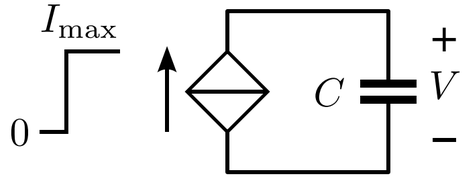
Limitation of the rate of change of the signal

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

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



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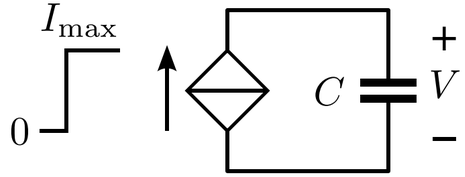

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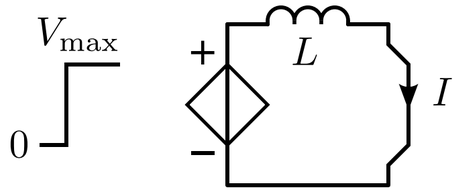

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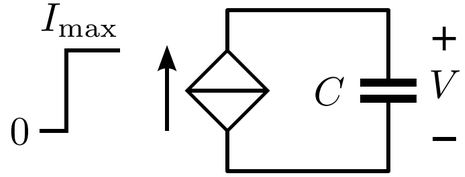

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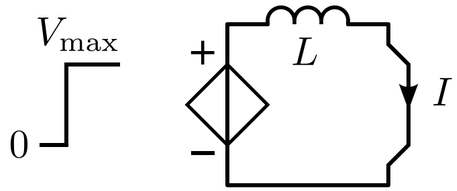

Limitation of the full-power bandwidth

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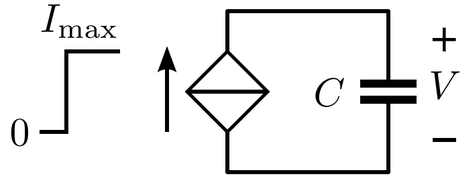

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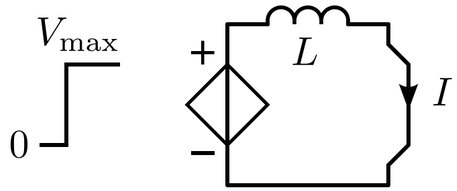

Limitation of the full-power bandwidth

Maximum frequency of a sinusoidal signal of which:

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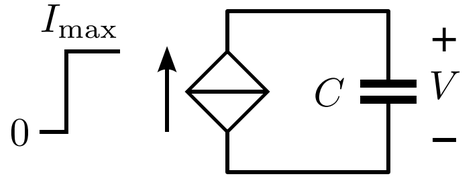

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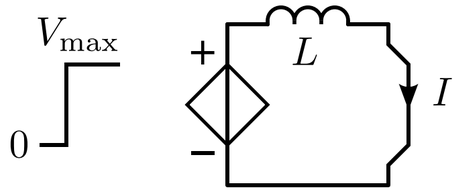

Limitation of the full-power bandwidth

Maximum frequency of a sinusoidal signal of which:

peak-to-peak value equals maximum static signal swing

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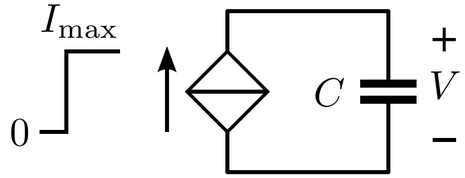

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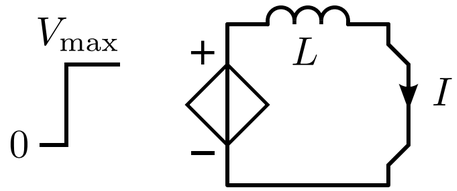

Limitation of the full-power bandwidth

Maximum frequency of a sinusoidal signal of which:

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maximum of time derivative equals slew-rate limitation

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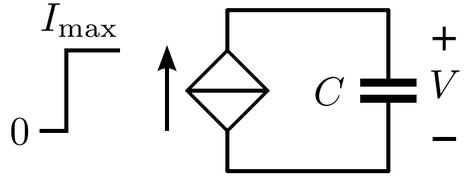

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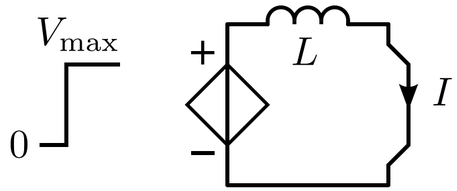

Limitation of the full-power bandwidth

Maximum frequency of a sinusoidal signal of which:

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maximum of time derivative equals slew-rate limitation

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

← Maximum peak-to-peak signal swing

← Slew-rate limitation

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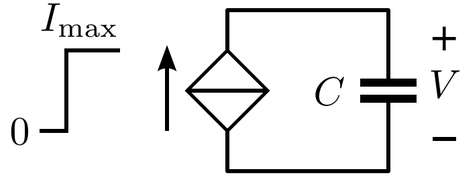

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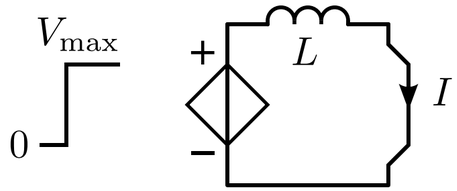

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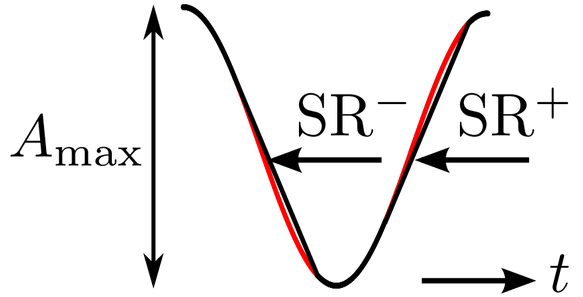

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← Maximum peak-to-peak signal swing

← Slew-rate limitation