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CHAPTER SUMMARY

- Stacking a transistor atop another forms a cascode structure, resulting in a high output impedance.
- The cascode topology can also be considered an extreme case of source or emitter degeneration.
- The voltage gain of an amplifier can be expressed as $-G_m R_{out}$, where G_m denotes the short-circuit transconductance of the amplifier. This relationship indicates that the gain of amplifiers can be maximized by maximizing their output impedance.
- With its high output impedance, a cascode stage can operate as a high-gain amplifier.
- The load of a cascode stage is also realized as a cascode circuit so as to approach an ideal current source.
- Setting the bias currents of analog circuits to well-defined values is difficult. For example, resistive dividers tied to the base or gate of transistors result in supply- and temperature-dependent currents.
- If V_{BE} or V_{GS} are well-defined, then I_C or I_D are not.
- Current mirrors can “copy” a well-defined reference current numerous times for various blocks in an analog system.
- Current mirrors can scale a reference current by integer or non-integer factors.
- Current mirrors are rarely used in discrete design as their accuracy depends on matching between transistors.