



# Electronics II

## Lecture 07 BJT Small Signal Analysis

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# Previous Lecture

- BJT Small Signal Analysis
  - CE Voltage Divider Bias Configuration.
  - CE Emitter Bias Configuration.



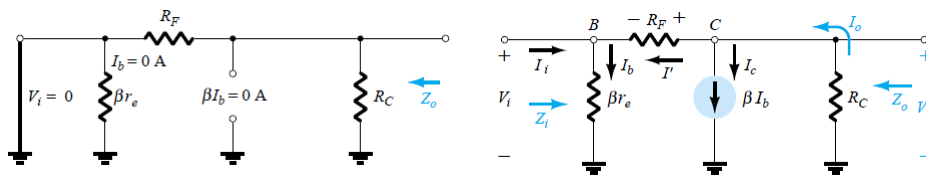
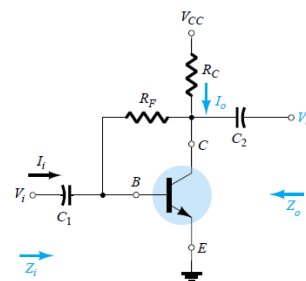
# Session Overview

<b>Topic</b>	BJT Small Signal Analysis
<b>Concepts</b>	Small Signal Analysis of CE ▪ Collector Feedback Configuration. ▪ Emitter Follower Configuration. ▪ Common Base Configuration.
<b>Recommended Reading</b>	Sections 8.5, 8.6 & 8.7 of [1]
<b>Keywords</b>	Emitter Bias, Collector Feedback, Emitter Follower, Common Base .



# Collector Feed Back Configuration

- Input Impedance,  $Z_i$
- Output Impedance,  $Z_o$

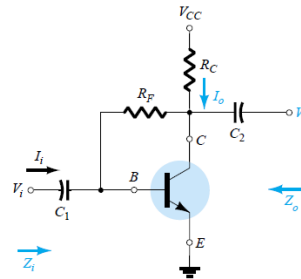


Robert L. Boylestad, *Electronic Devices and Circuit Theory*, 8<sup>th</sup> Edition, Pearson Education Inc, ISBN: 81-7808-590-9.

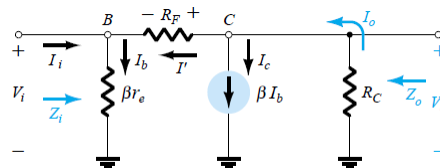


# Collector Feed Back Configuration

- Voltage Gain,  $A_v$



- Current Gain,  $A_i$

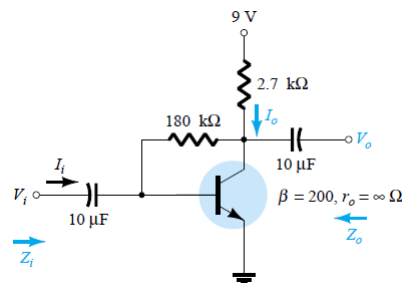


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# Collector Feed Back Configuration

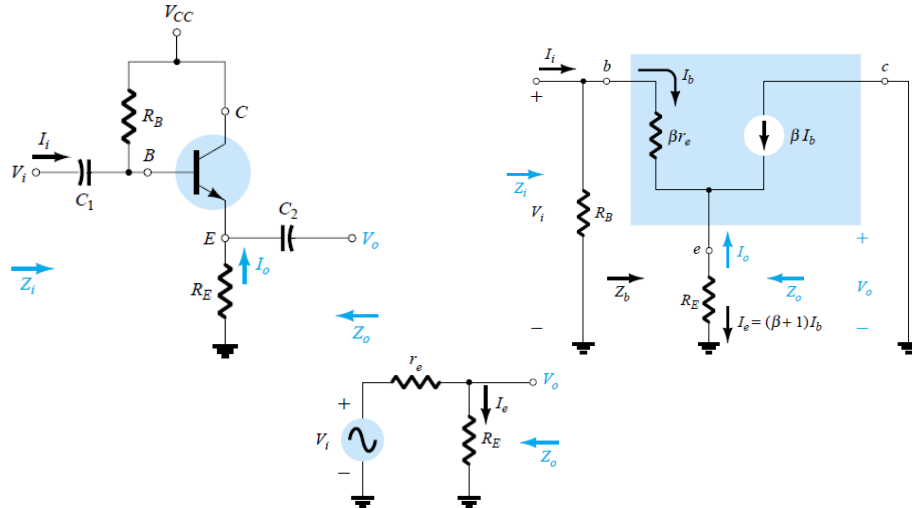
- *Example 8.9 (Boylestad):* For given network, calculate  $r_e$ ,  $Z_i$ ,  $Z_o$ ,  $A_v$  and  $A_i$ .
  - Calculate with  $r_o = 20 \text{ k}\Omega$



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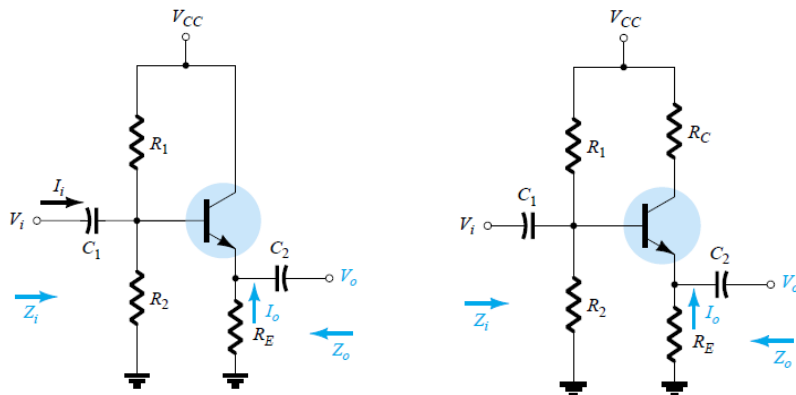
# Emitter Follower Configuration



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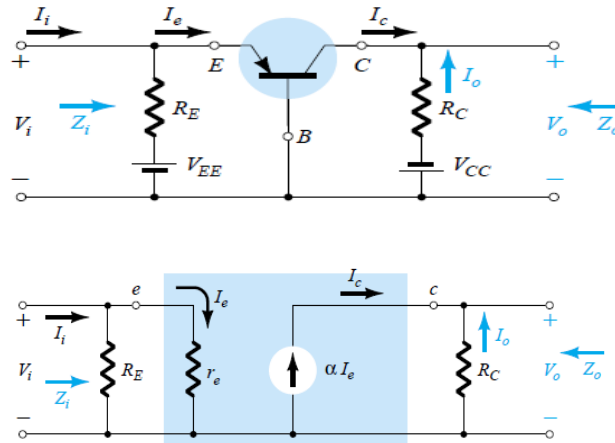
# Emitter Follower Configuration



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# Common Base Configuration



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# References

- [1] Robert L. Boylestad, *Electronic Devices and Circuit Theory*, 8<sup>th</sup> Edition, Pearson Education Inc, ISBN: 81-7808-590-9.