

EE 3113

INTRODUCTION INTO RF

CIRCUIT DESIGN

Lecture Notes for A-term 1999

LECTURE 13

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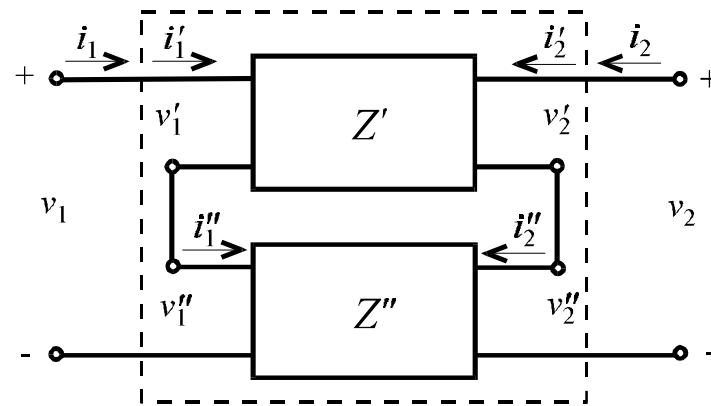
Worcester, MA 01609

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Interconnecting Networks

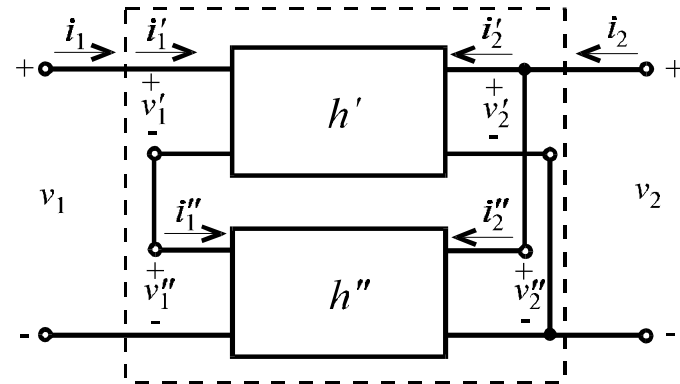
- Certain networks are more advantageous to interconnect.

Example: series connection



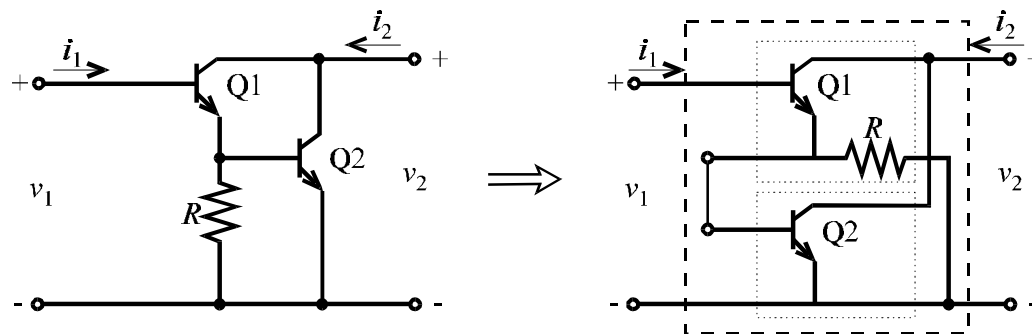
$$[Z] = [Z'] + [Z'']$$

- Hybrid representation



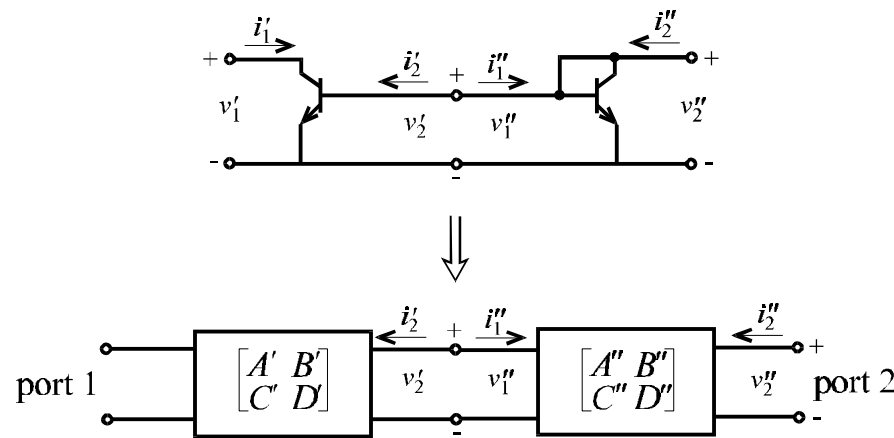
$$[h] = [h'] + [h'']$$

Typical example



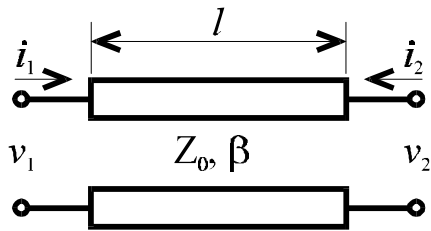
ABCD parameter representation

- Very useful when cascading networks



$$\begin{Bmatrix} v_1 \\ i_1 \end{Bmatrix} = \begin{bmatrix} A' & B' \\ C' & D' \end{bmatrix} \begin{bmatrix} A'' & B'' \\ C'' & D'' \end{bmatrix} \begin{Bmatrix} v_2'' \\ -i_2'' \end{Bmatrix}$$

ABCD network is very useful for transmission line representations



$$\begin{bmatrix} A & B \\ C & D \end{bmatrix} = \begin{bmatrix} \cos(bl) & jZ_0 \sin(bl) \\ j \frac{\sin(bl)}{Z_0} & \cos(bl) \end{bmatrix}$$

Example:

