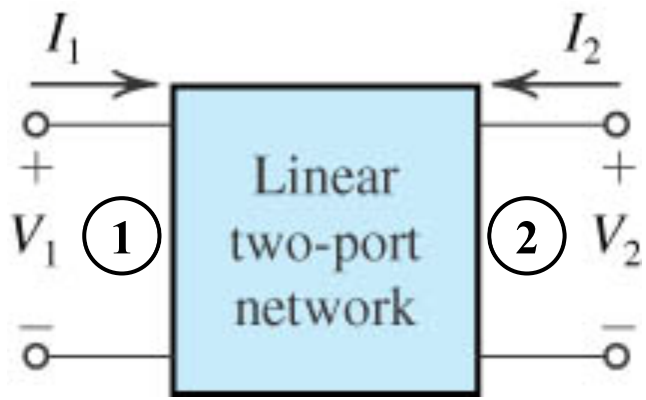
Caratterizzazione delle reti a due porte

Rete lineare a due porte

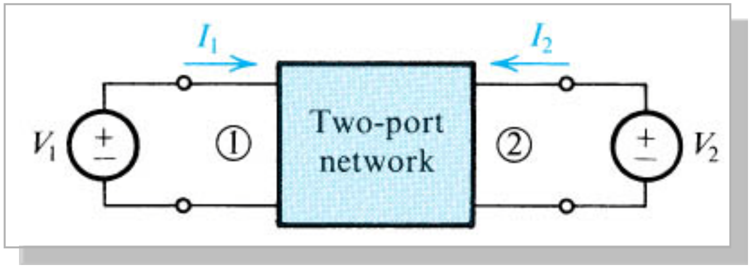


Parametri y (o ammettenze di corto circuito)

Per una qualsiasi rete lineare

$$\begin{cases} I_1 = y_{11}V_1 + y_{12}V_2 \\ I_2 = y_{21}V_1 + y_{22}V_2 \end{cases}$$

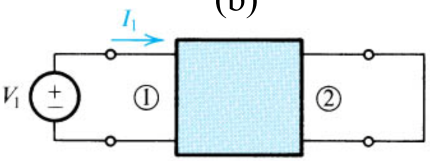
(a)



dove:

(b)

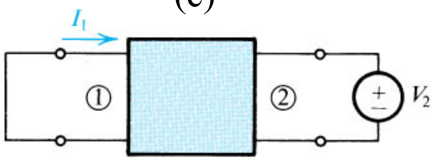
$$y_{11} \triangleq \left.\frac{I_1}{V_1}\right|_{V_2=0}$$



rappresenta l'**ammettenza di ingresso** con l'uscita in cc

(c)

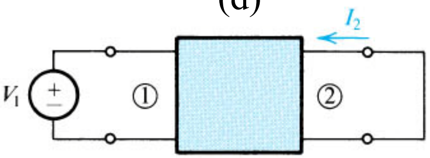
$$y_{12} \triangleq \left.\frac{I_1}{V_2}\right|_{V_1=0}$$



rappresenta il **parametro di retroazione** con l'ingresso in cc

(d)

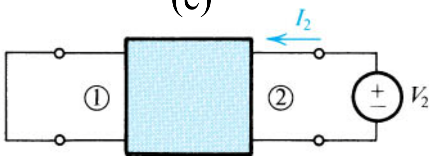
$$y_{21} \triangleq \left.\frac{I_2}{V_1}\right|_{V_2=0}$$



rappresenta il **parametro di trasmissione** con l'uscita in cc

(e)

$$y_{22} \triangleq \left.\frac{I_2}{V_2}\right|_{V_1=0}$$



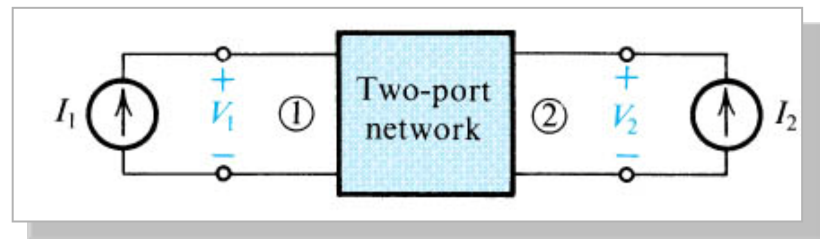
rappresenta l'**ammettenza di uscita** con l'ingresso in cc

Parametri z (o impedenze a circuito aperto)

Per una qualsiasi rete lineare

$$\begin{cases} V_1 = z_{11} I_1 + z_{12} I_2 \\ V_2 = z_{21} I_1 + z_{22} I_2 \end{cases}$$

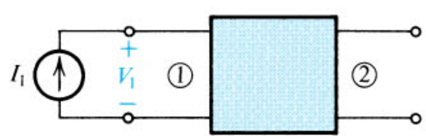
(a)



dove:

$$z_{11} \triangleq \left. \frac{V_1}{I_1} \right|_{I_2=0}$$

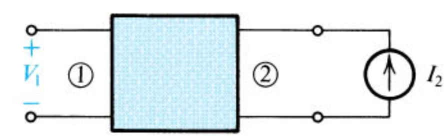
(b)



rappresenta l'**impedenza di ingresso** con l'uscita a ca

$$z_{12} \triangleq \left. \frac{V_1}{I_2} \right|_{I_1=0}$$

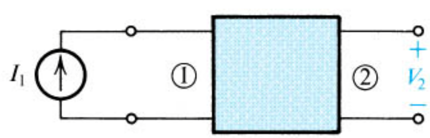
(c)



rappresenta il **parametro di retroazione** con l'ingresso a ca

$$z_{21} \triangleq \left. \frac{V_2}{I_1} \right|_{I_2=0}$$

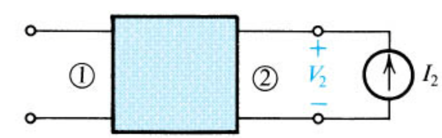
(d)



rappresenta il **parametro di trasmissione** con l'uscita a ca

$$z_{22} \triangleq \left. \frac{V_2}{I_2} \right|_{I_1=0}$$

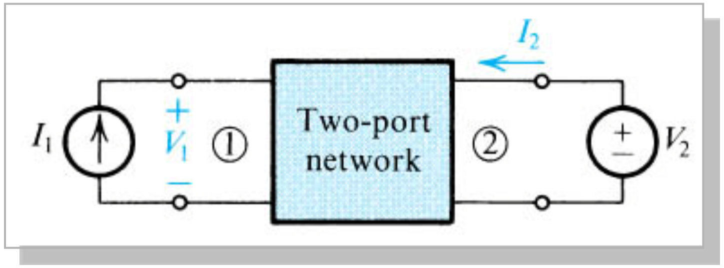
(e)



rappresenta l'**impedenza di uscita** con l'ingresso a ca

Parametri *h* (o parametri ibridi)

(a)



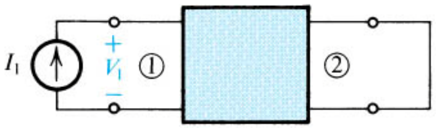
Per una qualsiasi rete lineare

$$\begin{cases} V_1 = h_{11} I_1 + h_{12} V_2 \\ I_2 = h_{21} I_1 + h_{22} V_2 \end{cases}$$

dove:

(b)

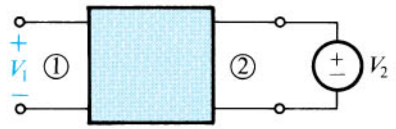
$$h_{11} \triangleq \left. \frac{V_1}{I_1} \right|_{V_2=0}$$



rappresenta l'**impedenza di ingresso** con l'uscita in cc

(c)

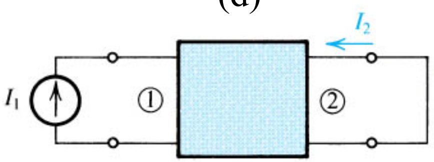
$$h_{12} \triangleq \left. \frac{V_1}{V_2} \right|_{I_1=0}$$



rappresenta il **rapporto di retroazione tra le tensioni** con l'ingresso a ca

(d)

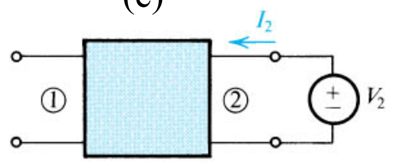
$$h_{21} \triangleq \left. \frac{I_2}{I_1} \right|_{V_2=0}$$



rappresenta il **guadagno di corrente** con l'uscita in cc

(e)

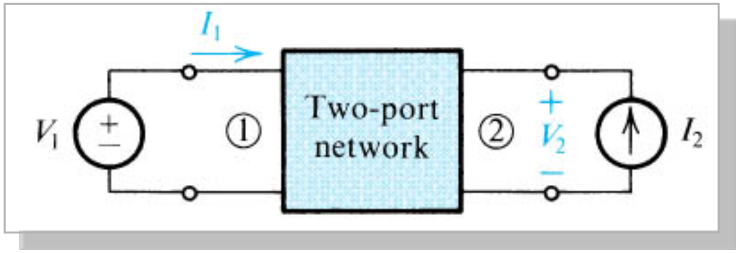
$$h_{22} \triangleq \left. \frac{I_2}{V_2} \right|_{I_1=0}$$



rappresenta l'**ammettenza di uscita** con l'ingresso a ca

Parametri g (o parametri ibridi inversi)

(a)



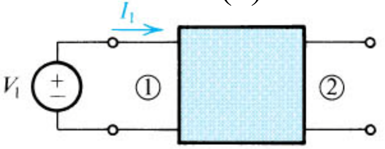
Per una qualsiasi rete lineare

$$\begin{cases} I_1 = g_{11}V_1 + g_{12}I_2 \\ V_2 = g_{21}V_1 + g_{22}I_2 \end{cases}$$

dove:

(b)

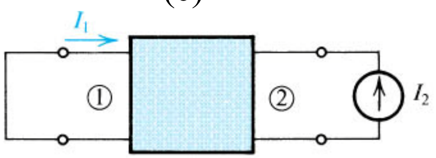
$$g_{11} \equiv \left.\frac{I_1}{V_1}\right|_{I_2=0}$$



rappresenta l'**ammettenza di ingresso** con l'uscita a ca

(c)

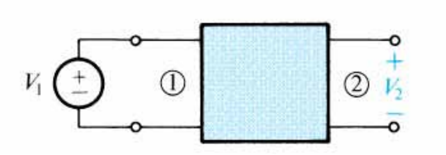
$$g_{12} \equiv \left.\frac{I_1}{I_2}\right|_{V_1=0}$$



rappresenta il **rapporto di retroazione tra le correnti** con l'ingresso in cc

(d)

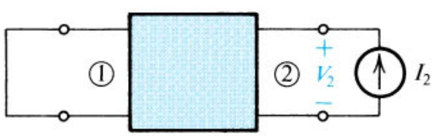
$$g_{21} \equiv \left.\frac{V_2}{V_1}\right|_{I_2=0}$$



rappresenta il **guadagno di tensione a vuoto** con l'uscita a ca

(e)

$$g_{22} \equiv \left.\frac{V_2}{I_2}\right|_{V_1=0}$$

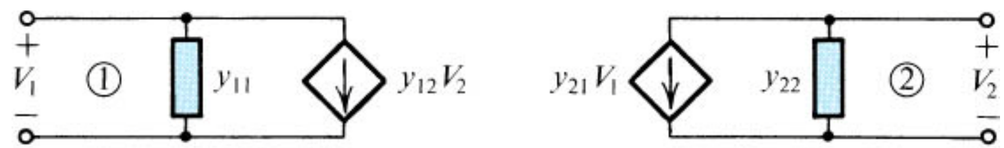


rappresenta l'**impedenza di uscita** con l'ingresso in cc

Rappresentazione con circuiti equivalenti

parametri y

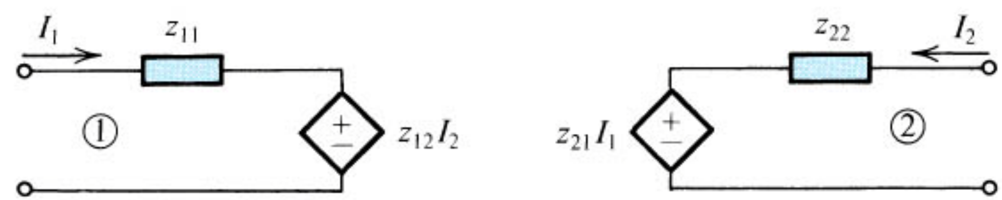
$$\begin{cases} I_1 = y_{11}V_1 + y_{12}V_2 \\ I_2 = y_{21}V_1 + y_{22}V_2 \end{cases}$$



(a)

parametri z

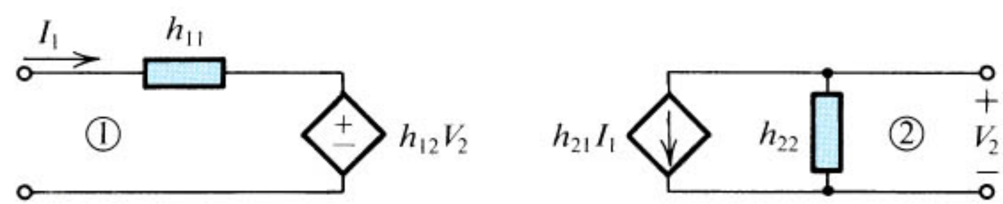
$$\begin{cases} V_1 = z_{11}I_1 + z_{12}I_2 \\ V_2 = z_{21}I_1 + z_{22}I_2 \end{cases}$$



(b)

parametri h

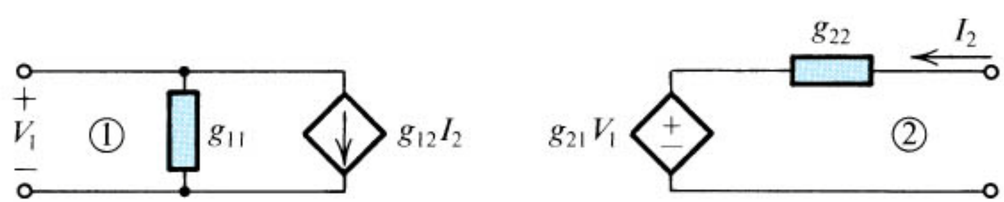
$$\begin{cases} V_1 = h_{11}I_1 + h_{12}V_2 \\ I_2 = h_{21}I_1 + h_{22}V_2 \end{cases}$$



(c)

parametri g

$$\begin{cases} I_1 = g_{11}V_1 + g_{12}I_2 \\ V_2 = g_{21}V_1 + g_{22}I_2 \end{cases}$$



(d)