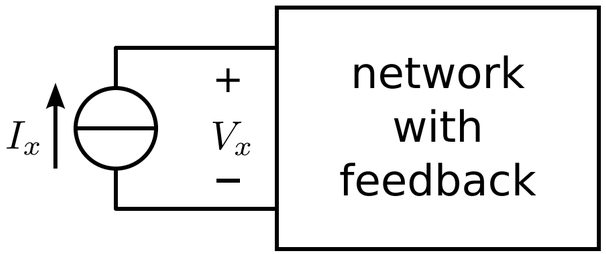
Structured Electronic Design

Port impedance of single-loop feedback amplifiers

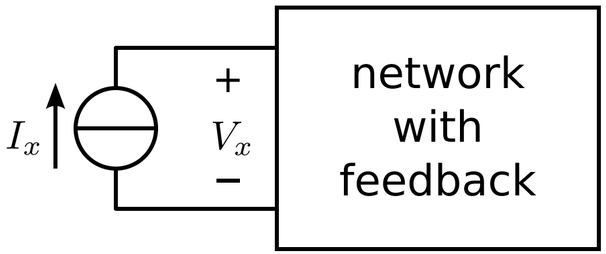
Anton J.M. Montagne

Port impedance and the asymptotic-gain model

Port impedance and the asymptotic-gain model

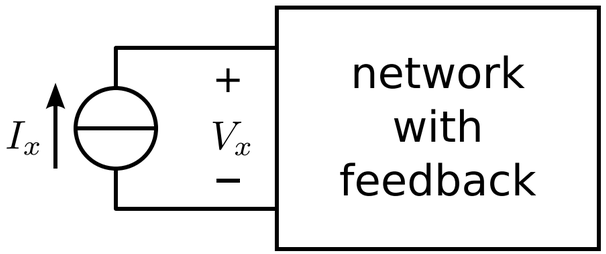


Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

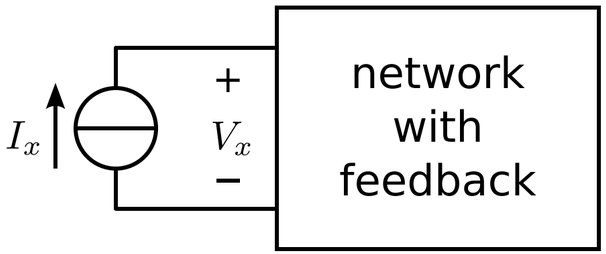
Port impedance and the asymptotic-gain model



$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

Port impedance and the asymptotic-gain model

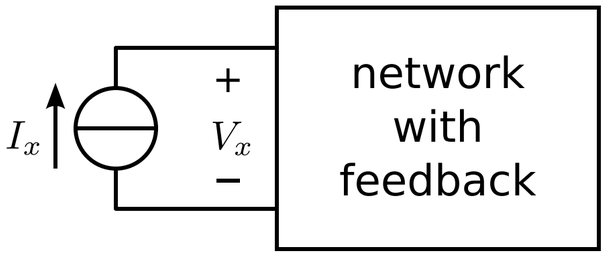


$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ Port impedance with gain of loop gain reference set to zero

Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

Port impedance and the asymptotic-gain model



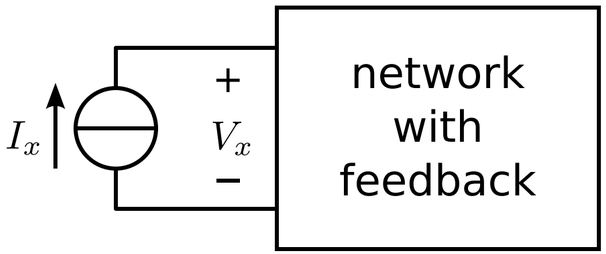
Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ Port impedance with gain of loop gain reference set to zero

L_{sc} Loop gain with port x shorted

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

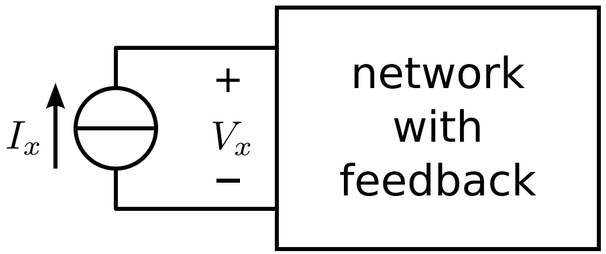
$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ Port impedance with gain of loop gain reference set to zero

L_{sc} Loop gain with port x shorted

L_o Loop gain with port x open

Port impedance and the asymptotic-gain model



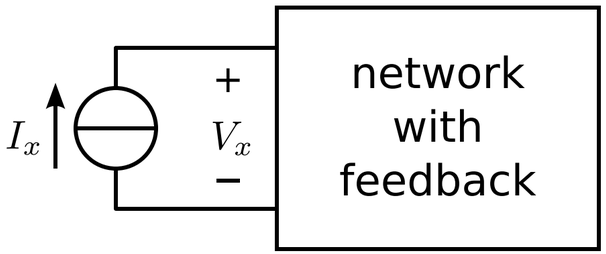
Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

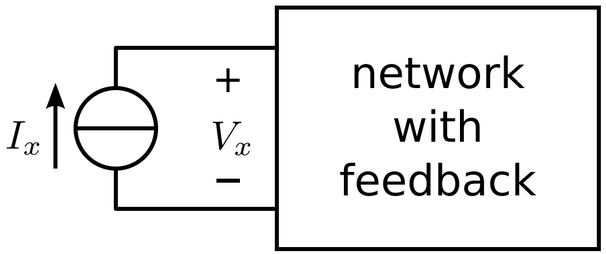
$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port:

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

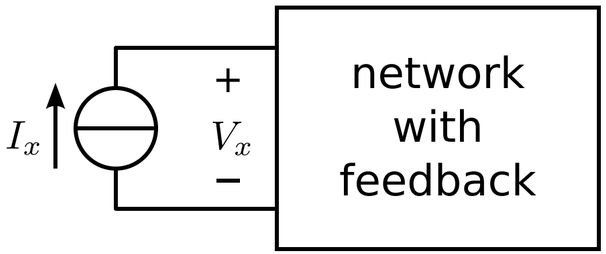
$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$

Port impedance and the asymptotic-gain model



$$Z_{xf} = \rho \frac{1 - L_{sc}}{1 - L_o}$$

ρ Port impedance with gain of loop gain reference set to zero

L_{sc} Loop gain with port x shorted

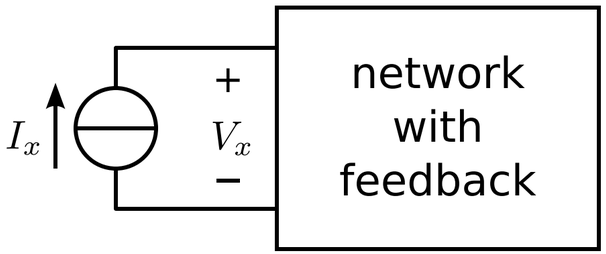
L_o Loop gain with port x open

Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$ Asymptotic-value of port impedance equals zero

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1 - L_{sc}}{1 - L_o}$$

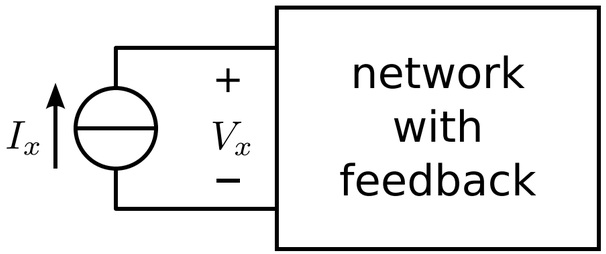
ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$ Asymptotic-value of port impedance equals zero

Series feedback at a port:

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1 - L_{sc}}{1 - L_o}$$

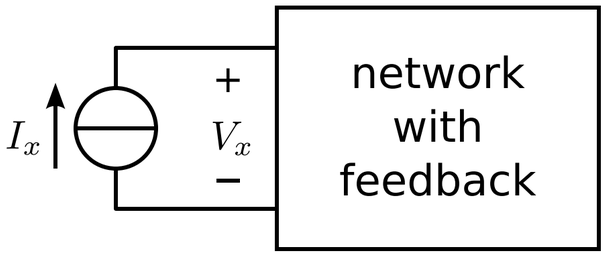
ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$ Asymptotic-value of port impedance equals zero

Series feedback at a port: $L_o = 0$

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

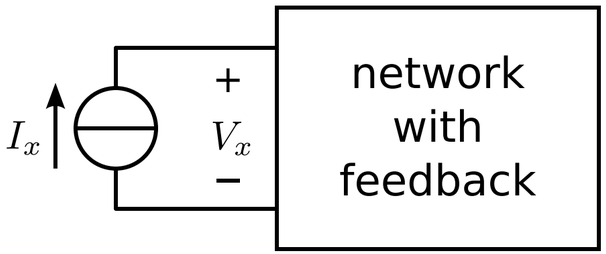
ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$ Asymptotic-value of port impedance equals zero

Series feedback at a port: $L_o = 0$ Asymptotic-value of port impedance equals infinity

Port impedance and the asymptotic-gain model



Impedance port x $Z_{xf} = \frac{V_x}{I_x}$

$$Z_{xf} = \rho \frac{1-L_{sc}}{1-L_o}$$

ρ	Port impedance with gain of loop gain reference set to zero
L_{sc}	Loop gain with port x shorted
L_o	Loop gain with port x open

Single-loop feedback amplifiers

Parallel feedback at a port: $L_{sc} = 0$ Asymptotic-value of port impedance equals zero

Series feedback at a port: $L_o = 0$ Asymptotic-value of port impedance equals infinity

