

Structured Electronic Design

EE3C11

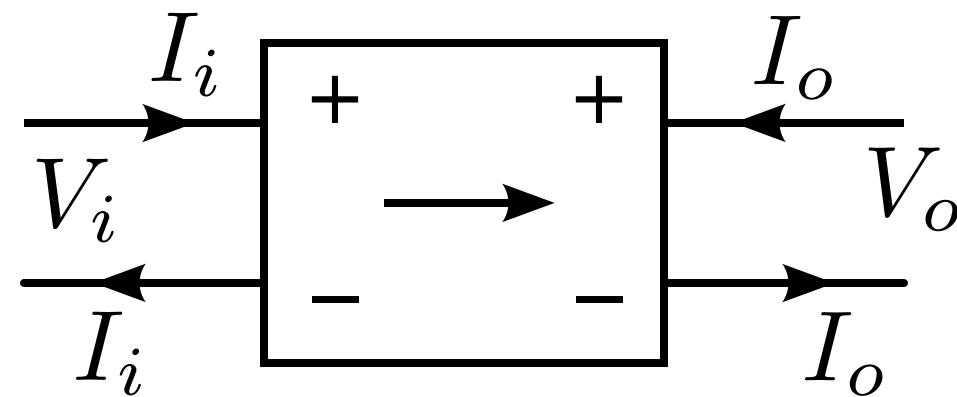
Amplifiers: modeling nonideal port isolation

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Two-ports and four-terminal networks

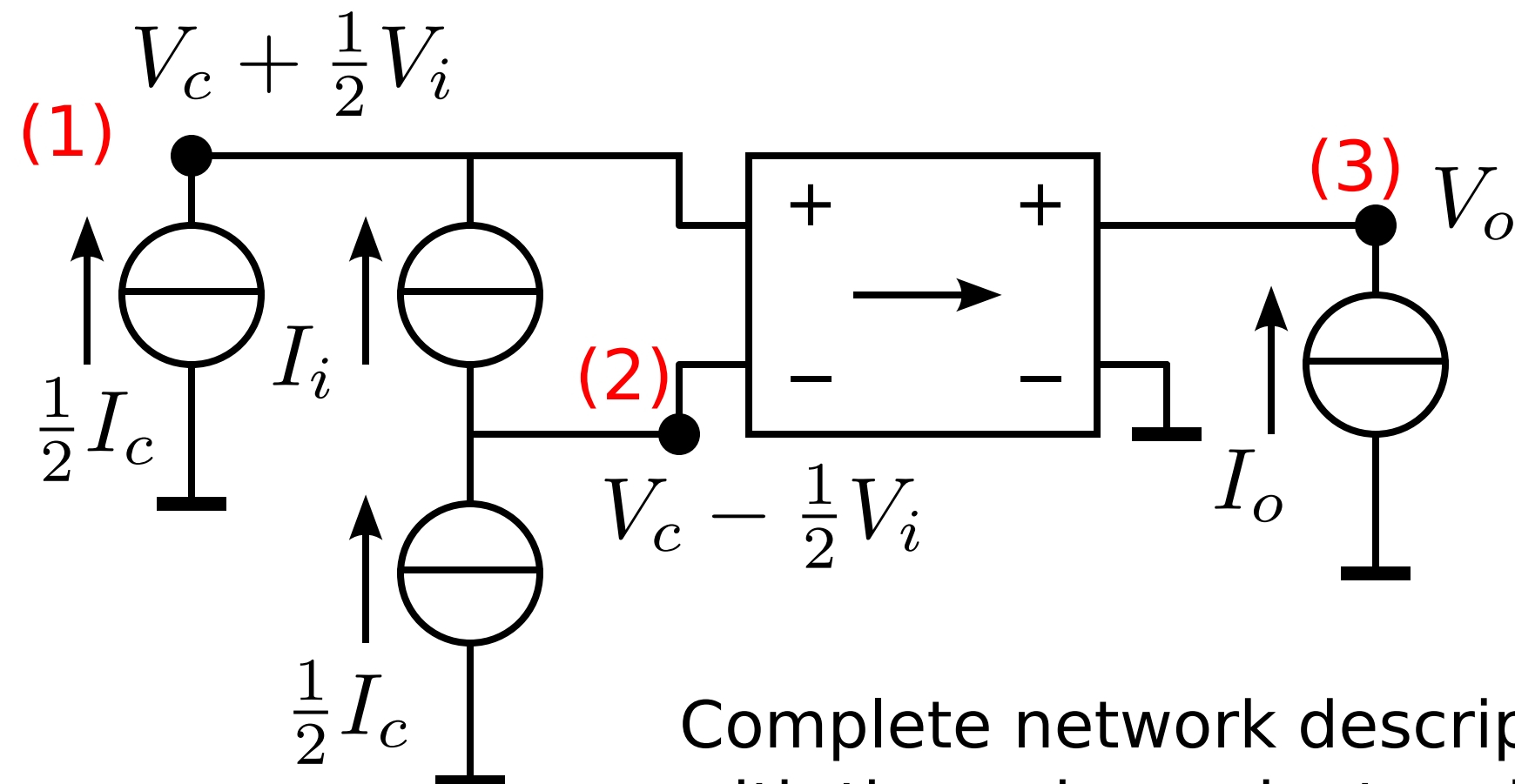
George P. Box (1987): all models are wrong, but some are useful

Two-port model



Useful functional model
with two independent and
two dependent variables

Complete network model



Complete network description
with three dependent and
three independent variables

Modeling of imperfect port isolation

Commonly used description methods are incomplete:

Four two-port matrix coefficients

Common-mode input impedance (floating input port)

Common-mode (voltage) rejection ratio

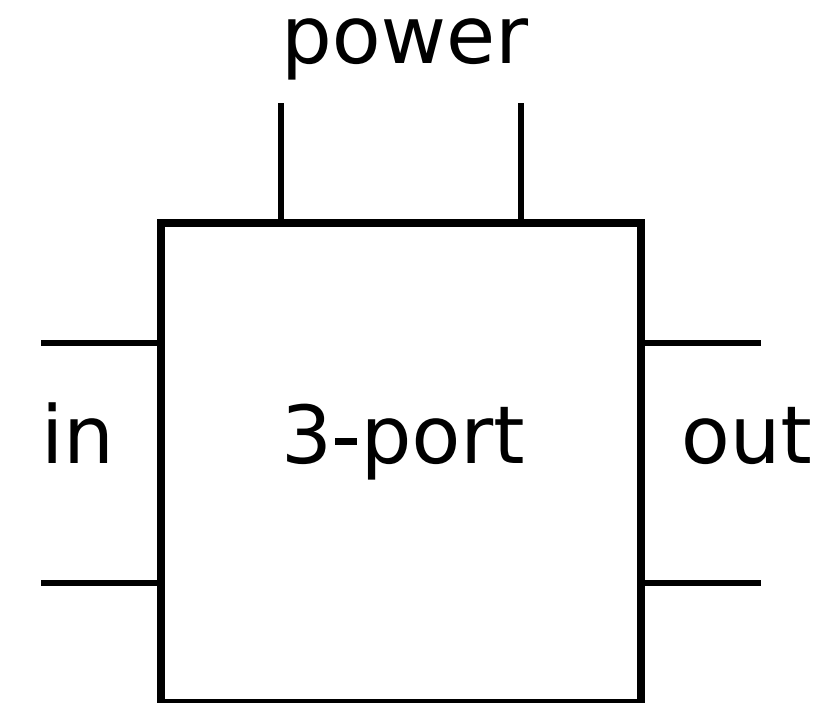
Common-mode (voltage) gain
(floating input port and floating output port)

Common-mode (voltage) rejection factor
(floating input port and floating output port)

Power supply rejection ratio (voltage)

Network theory: section 18.6.1

Specification of amplifiers: sections 2.4.1 and 2.4.1



6 nodes
(incl. reference node)

5 independent and 5
dependent variables

linear(ized):

25 matrix parameters