

Two-Port Parameters

Electrical Engineering

Four ways to describe the same black box, and what each one is convenient for.

One network, four equivalent descriptions.

Set	Independent variables	Best suited to
z impedance	I_1 and I_2	Series connection
y admittance	V_1 and V_2	Parallel connection
h hybrid	I_1 and V_2	Transistor models
ABCD chain	V_2 and I_2	Cascaded stages
S scattering	Incident waves	RF, where opens are hard

A reciprocal network has $z_{12} = z_{21}$; a symmetric one also has $z_{11} = z_{22}$. Both tests catch algebra errors early.