SECTION-B

ELECTRONIC INSTRUMENTS

Instruments for measurement of Voltage, Current & other circuit parameters

Quality and Dissipation Factors

- Different from the Q associated with resonators and filters

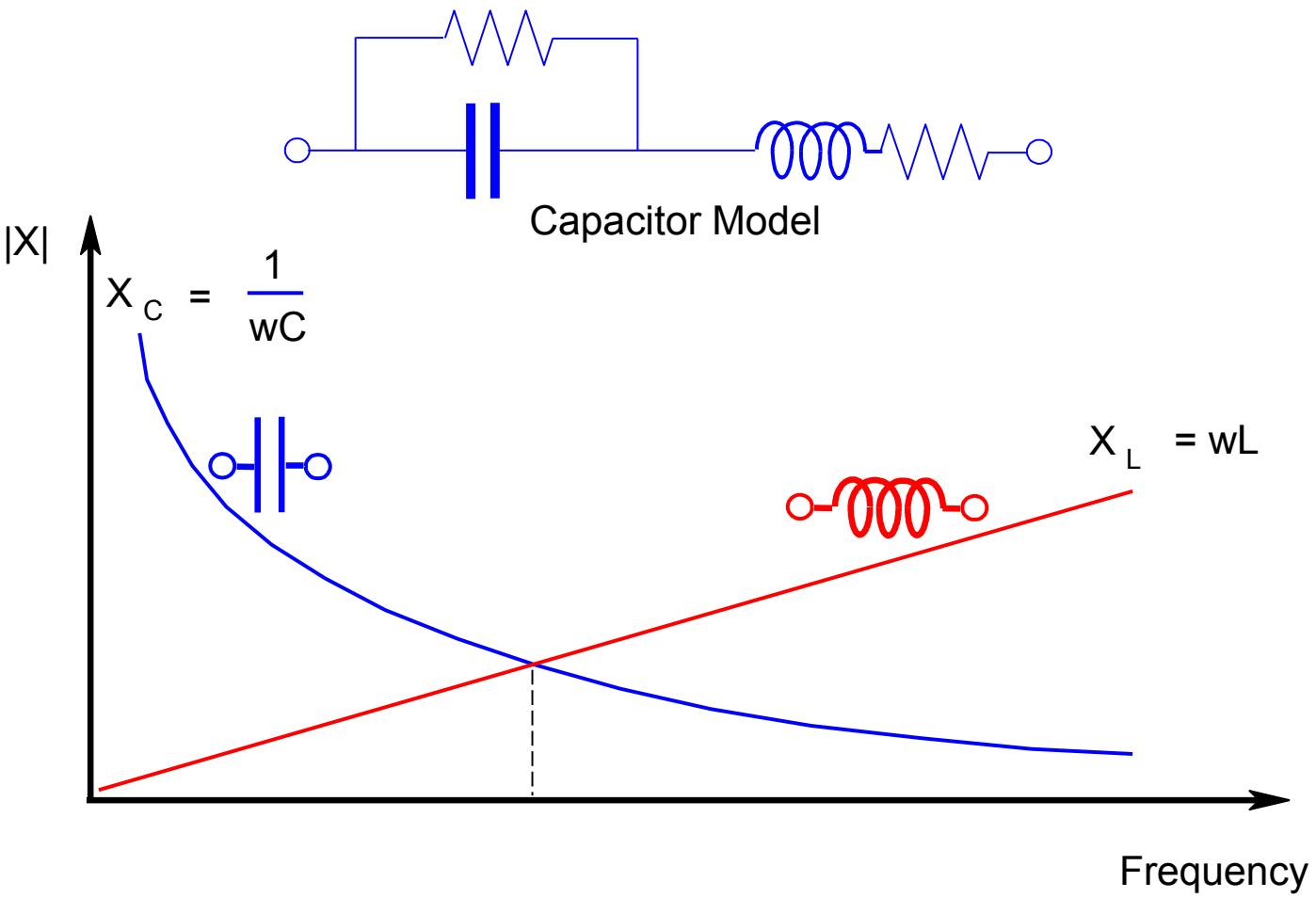
- $Q = \dfrac{\text{Energy stored}}{\text{Energy lost}} = \dfrac{X_s}{R_s}$

- The better the component, then

  $R \Rightarrow 0 \qquad Q \Rightarrow \infty$

- $D = \dfrac{1}{Q}$, mainly used for capacitors

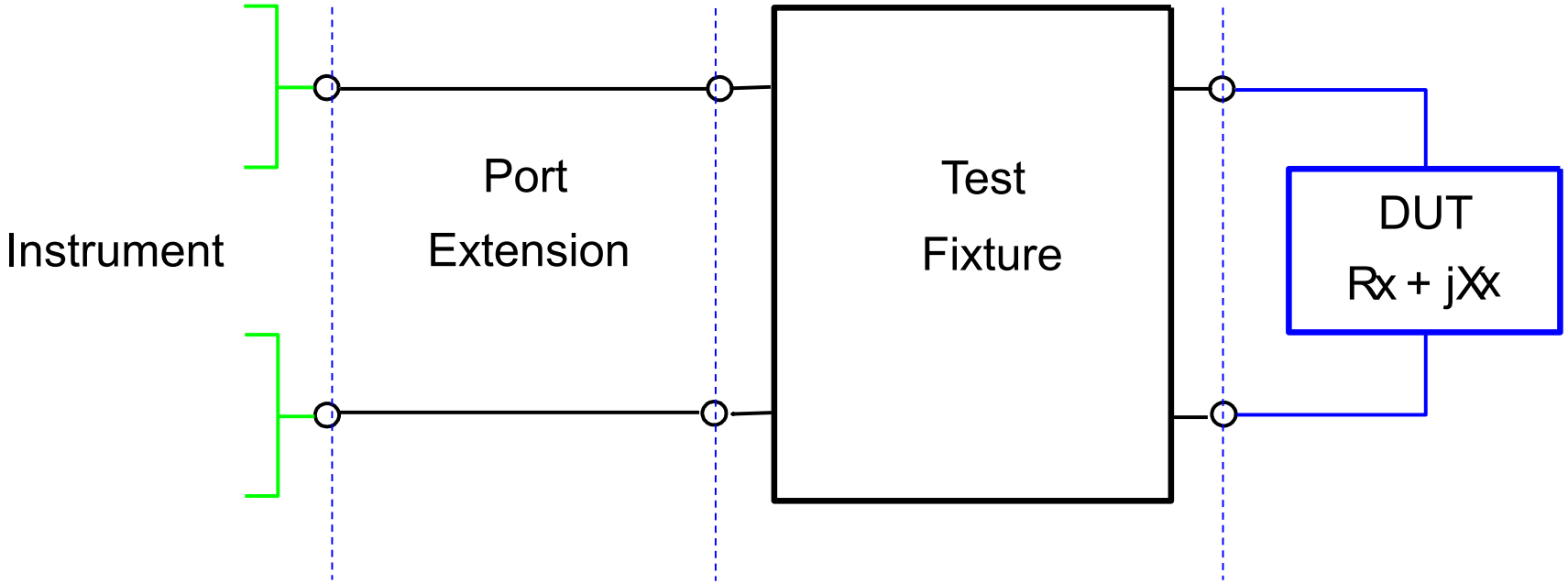
Capacitor Reactance vs. Frequency



Component Dependency Factors

- Test signal frequency
- Test signal level
- DC bias, voltage and current
- Environment (temperature, humidity, etc.)
- Component's current state
- Aging

Measurement Set-Up



Sources of Measurement Errors

- Measurement technique inaccuracies
- Port Extension complex residuals
- Fixture residuals
- RFI and other noise
- DUT stray and lead parasitics

Sources of Measurement Errors