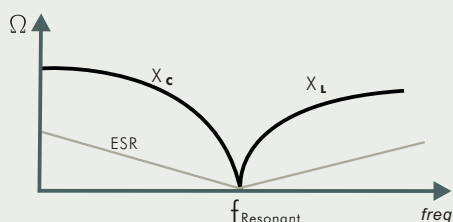


The Essence of Capacitor

FREQUENCY RESPONSE MODEL FROM A CAPACITOR



$$\text{Resonant Frequency, } f = \frac{1}{2\pi\sqrt{LC}}$$

$$|Z| = \sqrt{ESR^2 + (Xc - Xl)^2}$$

$$Xc = \frac{-1}{2\pi fc}$$

$$Xl = 2\pi fL$$



$$C = \frac{0.224KA}{T}$$

When 1) Working frequency = SRF of a capacitor

$$Xc - Xl = 0, |Z| \approx ESR$$

2) Working frequency < SRF

|Z| dominated by Xc

3) Working frequency > SRF

|Z| dominated by Xl

C = capacitance (Farads)

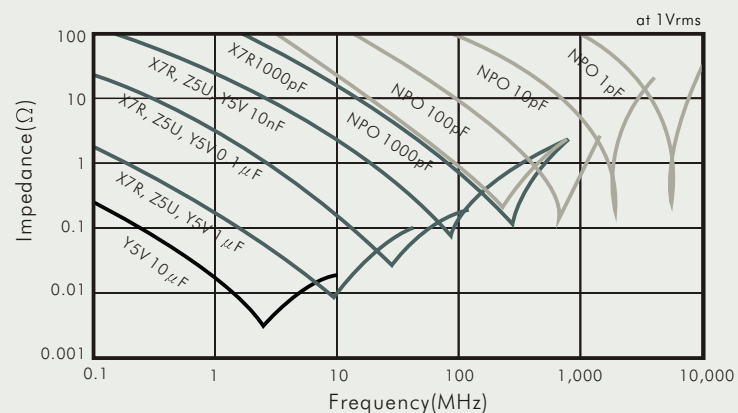
K = Dielectric constant

A = Area in square inches

T = Thickness of dielectric

0.224 = conversion constant

0.0884 for metric system, cm



Typical NPO, X7R, Z5U, Y5V Frequency Response