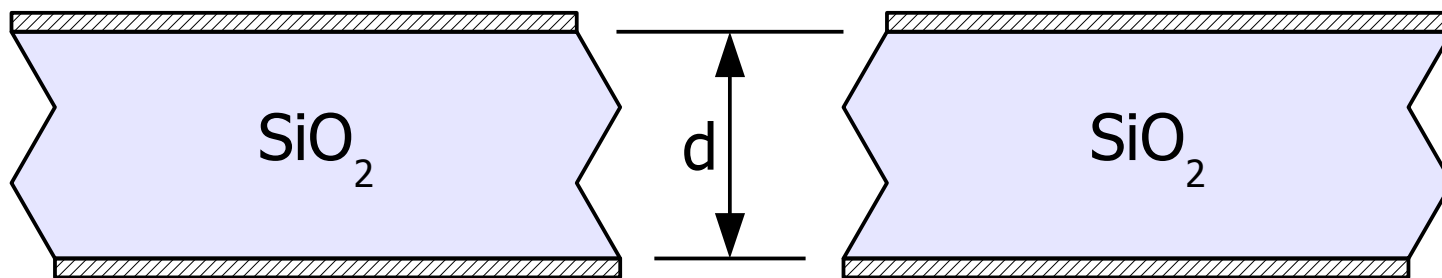
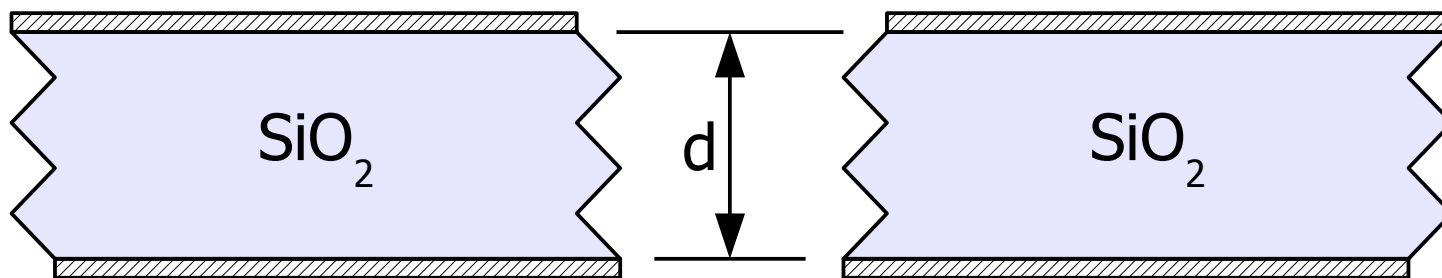


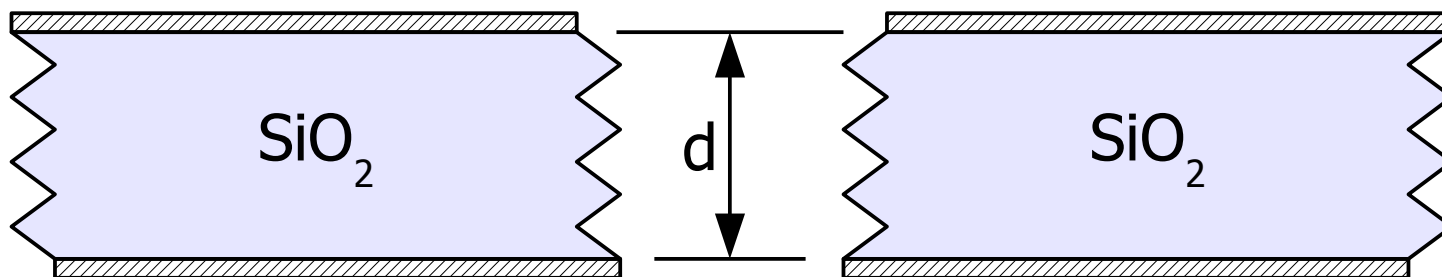
Osnovna rezonanca
 $f_1 \approx v/2d$



Tretji overton $\sim 3f_1$



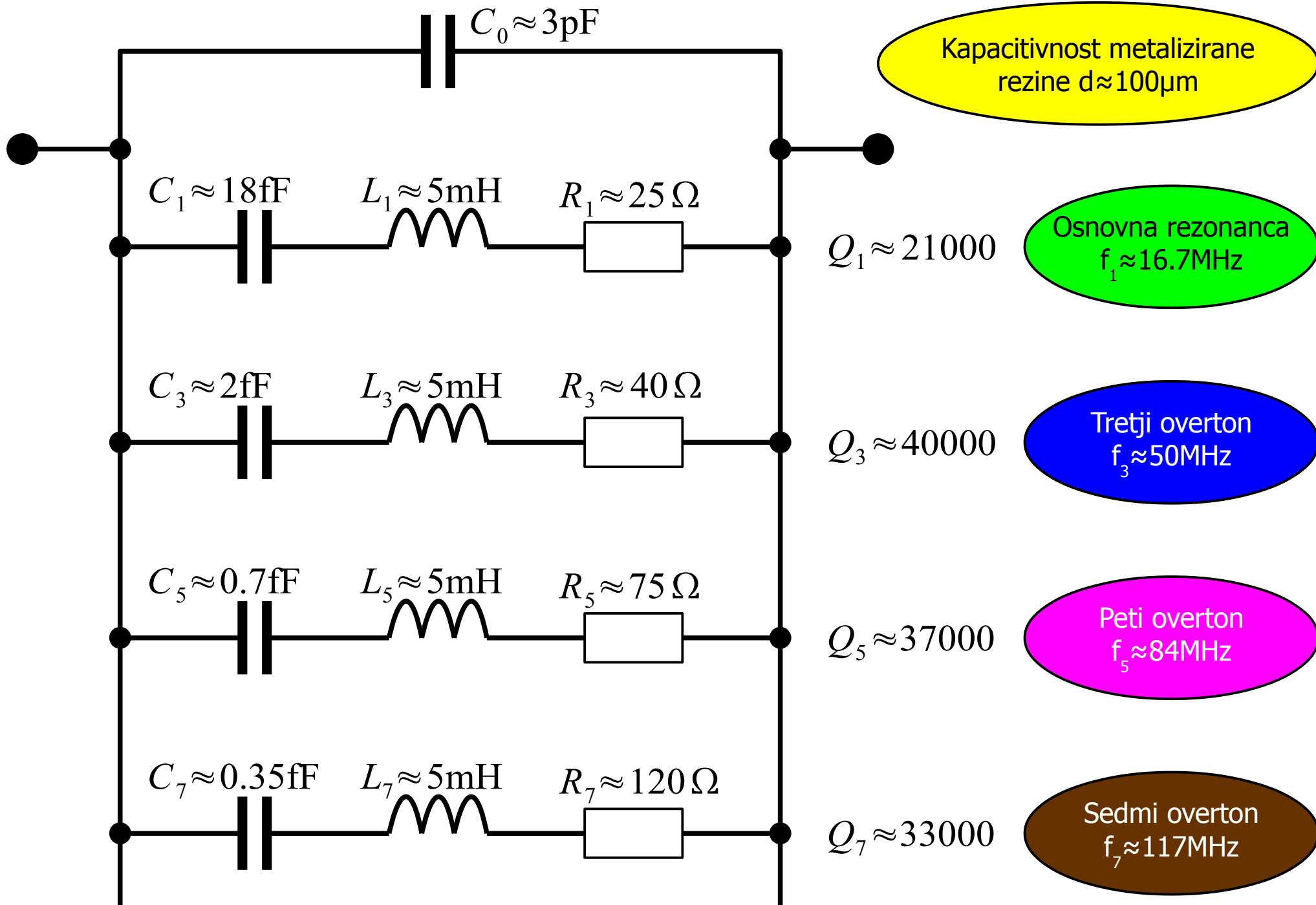
Peti overton $\sim 5f_1$



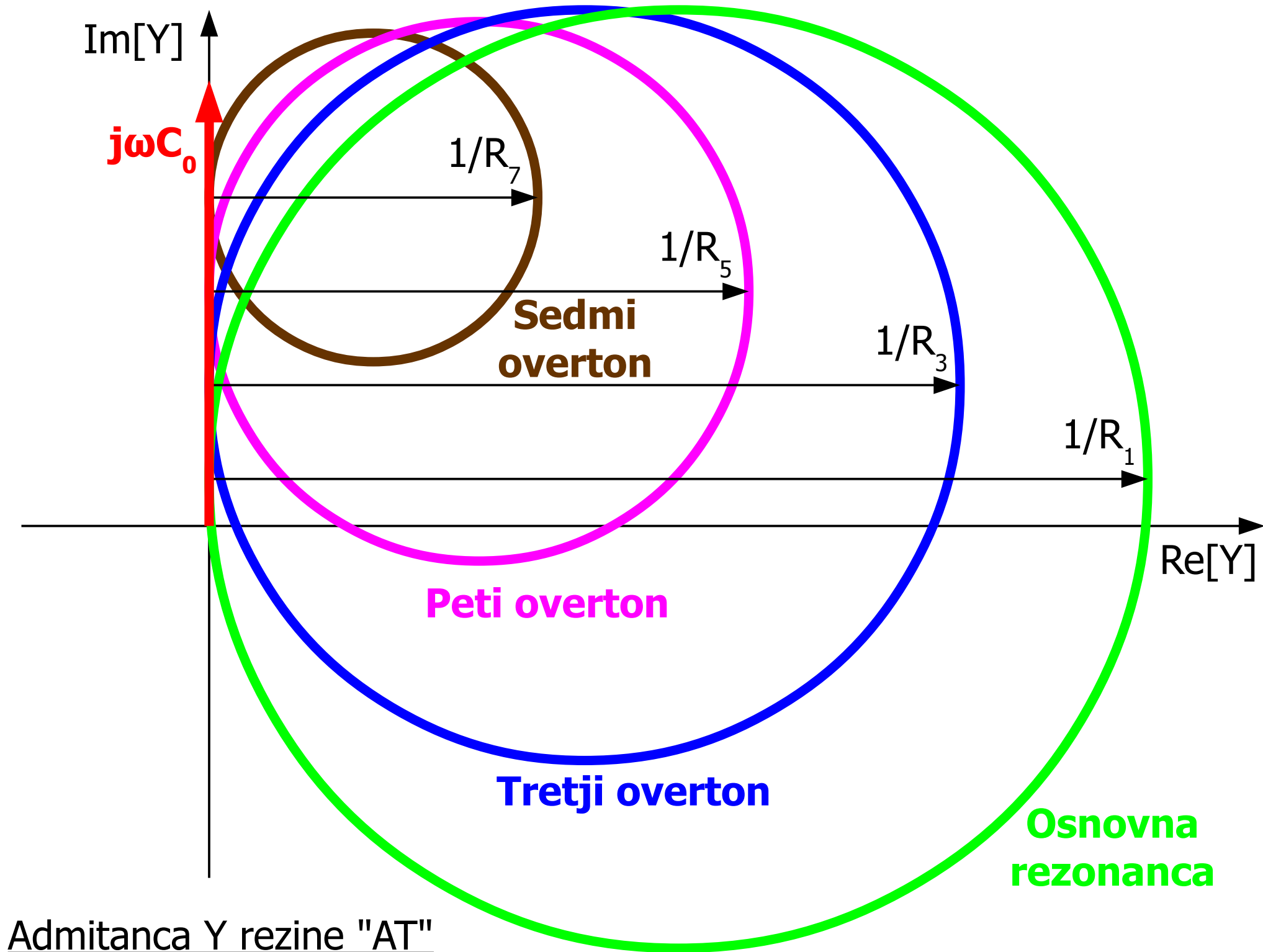
Sedmi overton $\sim 7f_1$

$v \approx 3.32 \text{ km/s}$

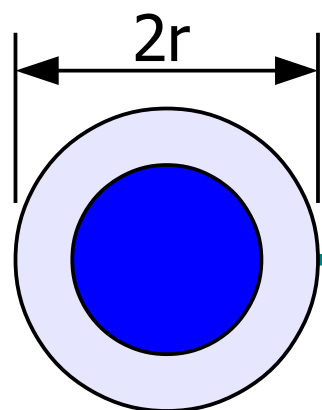
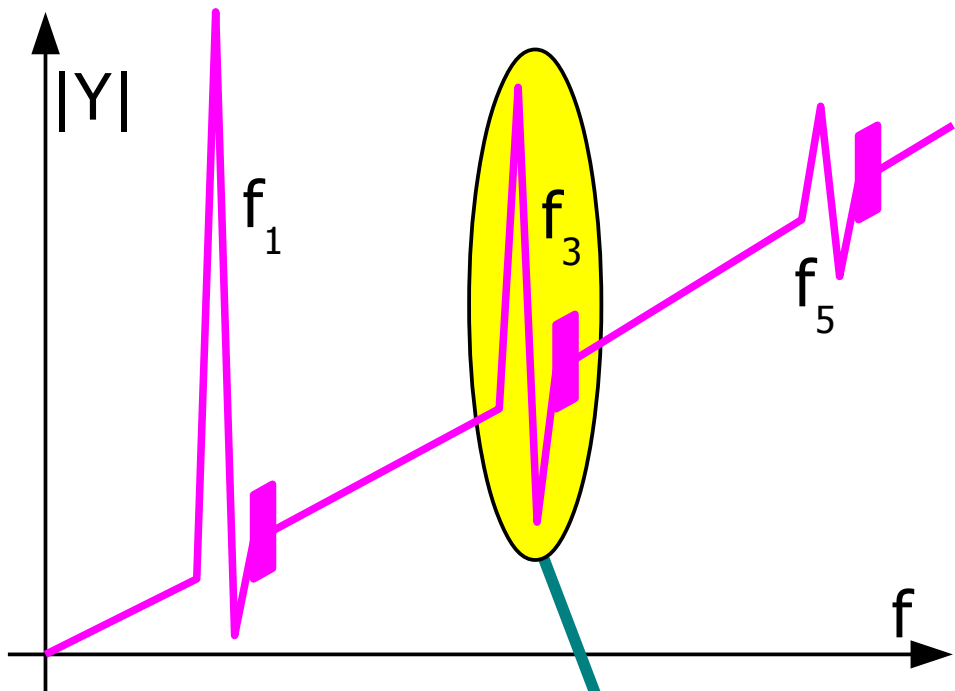
Rodovi strižnega nihanja rezine "AT" kremena



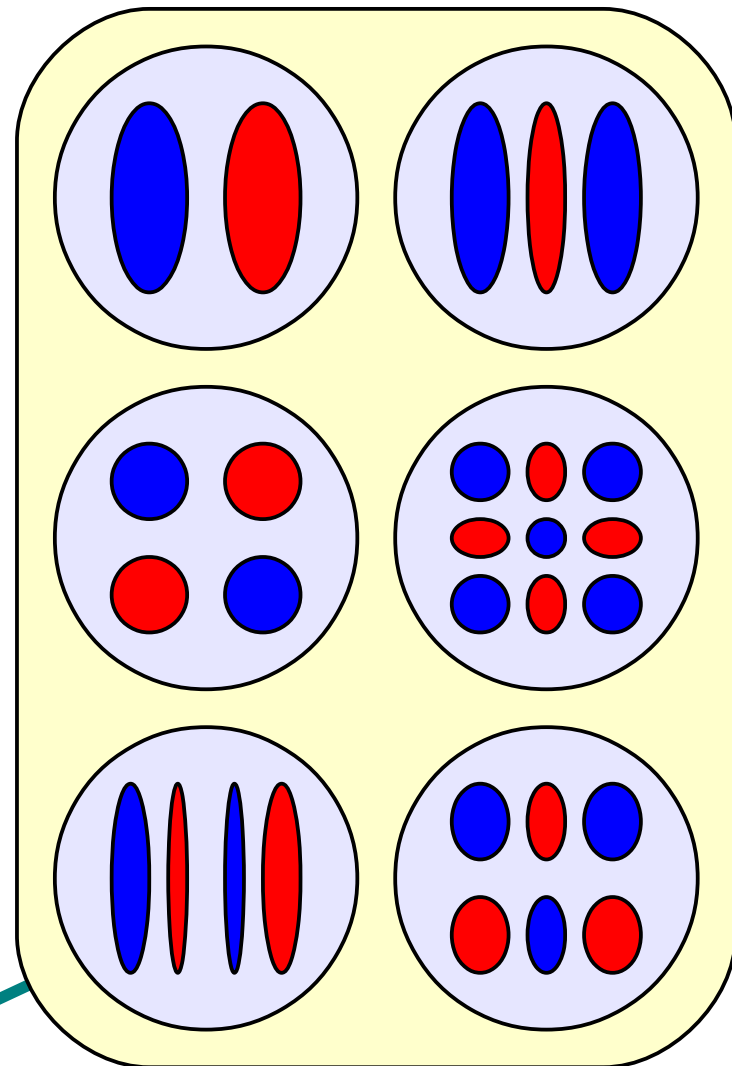
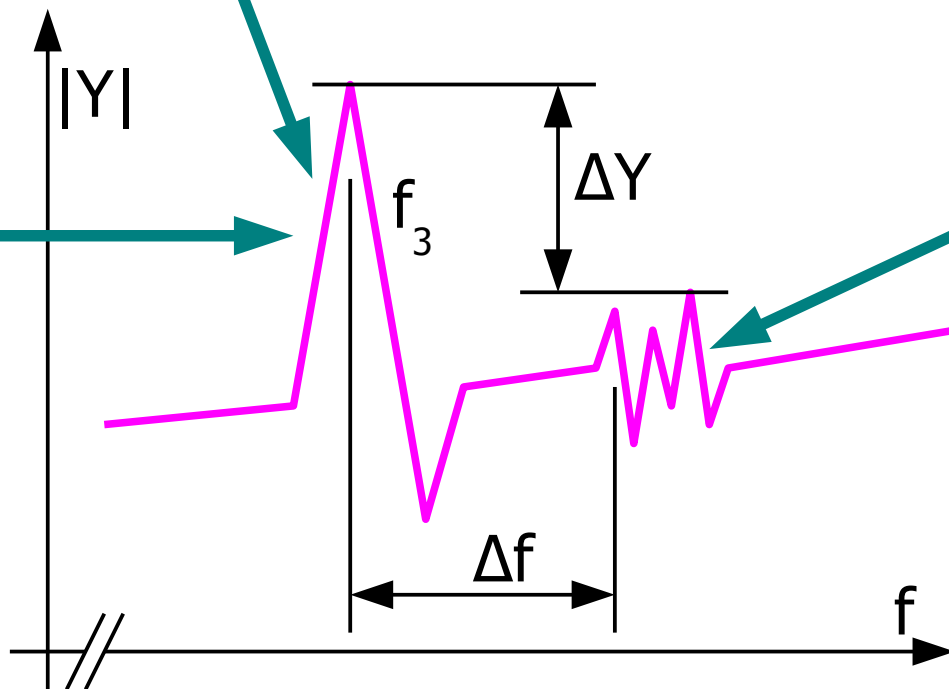
Nadomestno vezje rezine "AT"



Admitanca Y rezine "AT"



Osnovni prečni rod

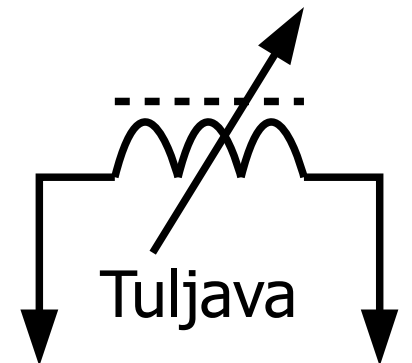
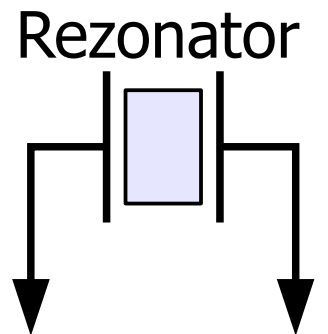
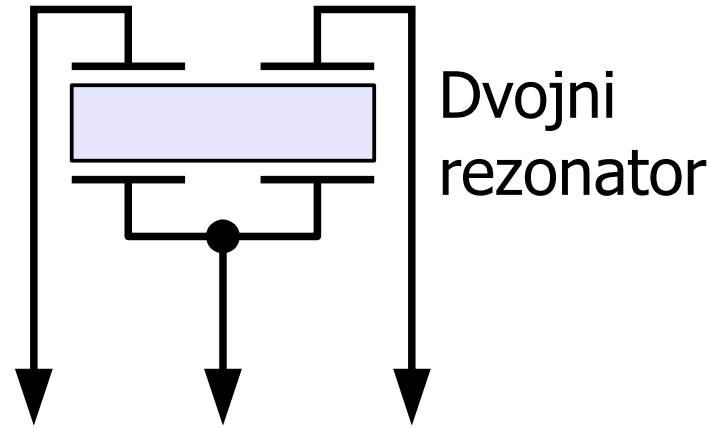
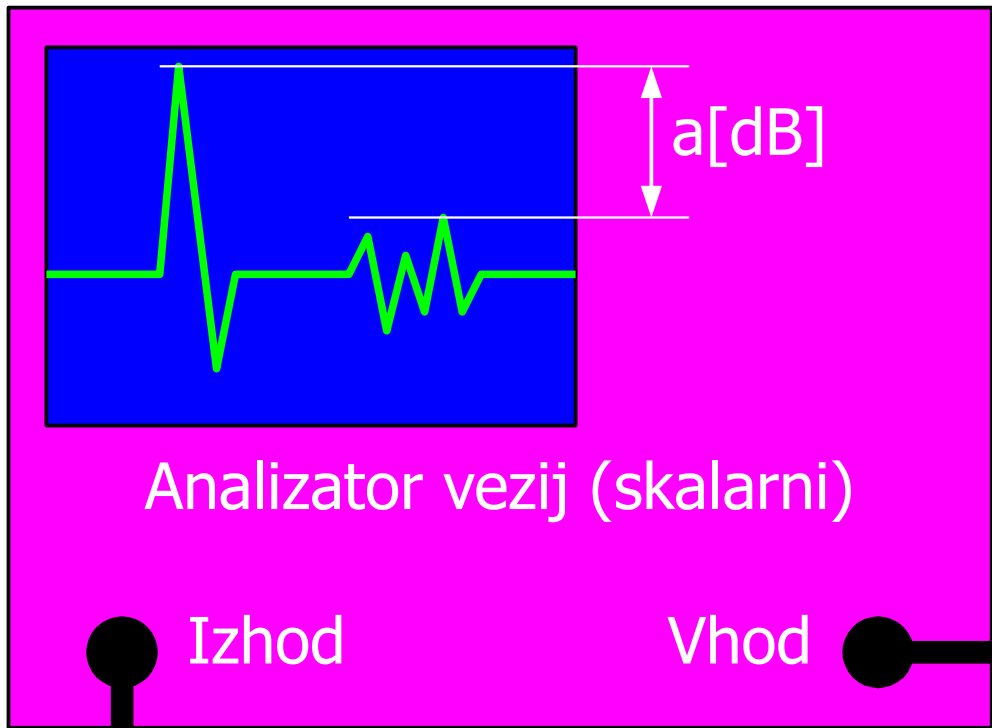


Višji prečni rodovi

$$\frac{\Delta f}{f_1} \approx \frac{d}{2r}$$

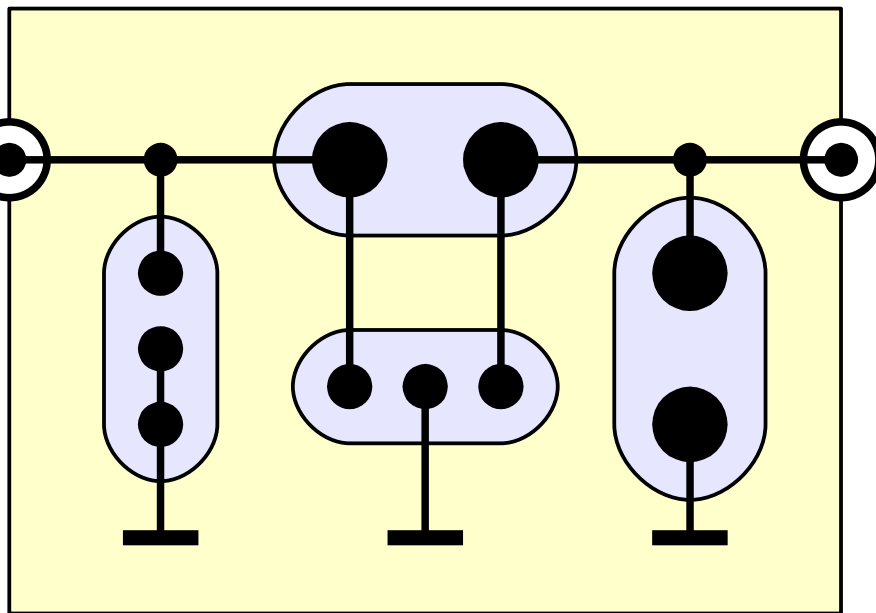
$$\Delta f \approx 100\text{kHz} < 1\text{MHz}$$

Neharmonski prečni rodovi rezine "AT"

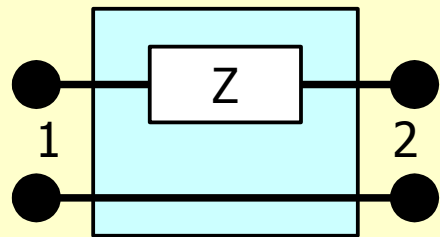
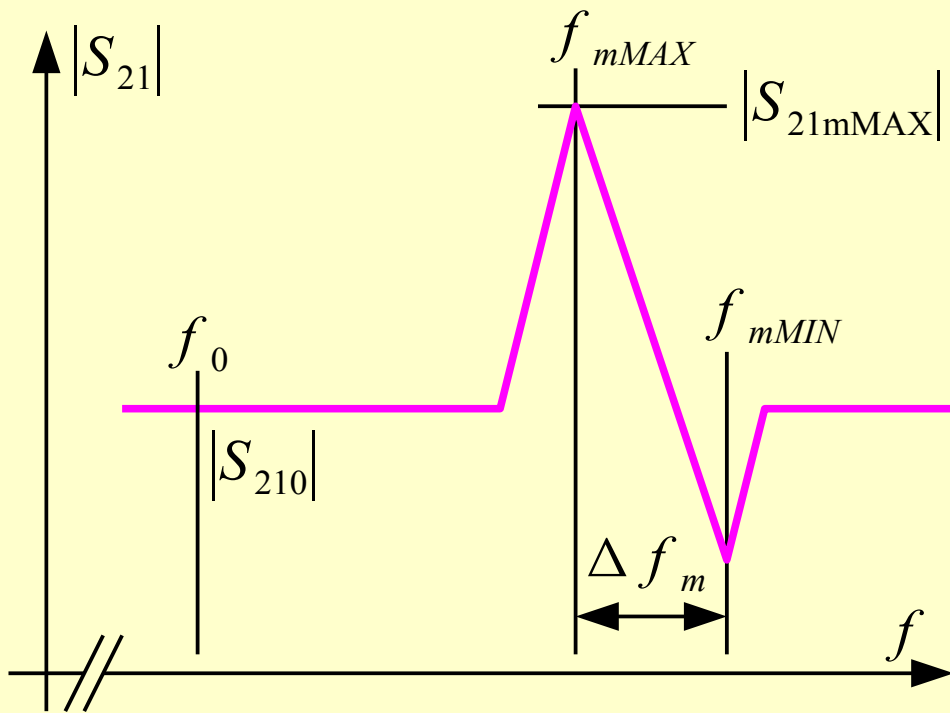


Koaksialni
kabel $Z_k = 50\Omega$

Koaksialni
kabel
 $Z_k = 50\Omega$



Merilno vezje za piezoelektrične rezonatorje



$$S_{21} = S_{12} = \frac{2 Zk}{Z + 2 Zk}$$

$$f = f_{mMAX} \quad Z \approx R_m \ll \frac{1}{2 \pi f_{mMAX} C_0}$$

$$R_m \approx 2 Zk \left(\frac{1}{|S_{21mMAX}|} - 1 \right)$$

Izgube
overtona m

$$f_{mMAX} \approx \frac{1}{2 \pi \sqrt{L_m C_m}}$$

Zaporedna
rezonanca
overtona m

$$f_{mMIN} \approx \frac{1}{2 \pi \sqrt{L_m \frac{C_m C_0}{C_m + C_0}}}$$

Vzporedna
rezonanca
overtona m

$$\Delta f_m = f_{mMIN} - f_{mMAX}$$

$$C_m \approx C_0 \frac{2 \Delta f_m}{f_{mMAX}}$$

$$L_m \approx \frac{1}{(2 \pi f_{mMAX})^2 C_m}$$

$$f = f_0 \ll f_{mMAX}$$

Kapacitivnost elektrod

$$|Z| = \frac{1}{2 \pi f_0 C_0} \gg Zk$$

$$C_0 \approx \frac{|S_{210}|}{4 \pi f_0 Zk}$$

Izračun električnih parametrov rezonatorja