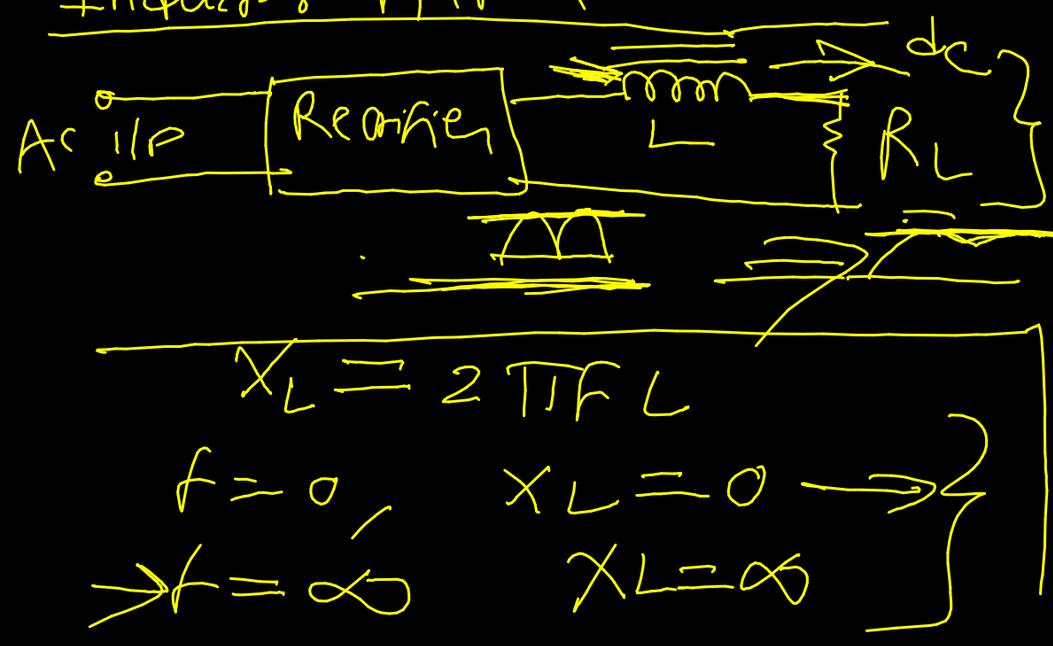
$$X_C = \frac{1}{2\pi f C}$$

$f = 0$, $X_C = \infty$

$f = \infty$ $X_C = 0$

Capacitor will block dc comp

Inductor filter



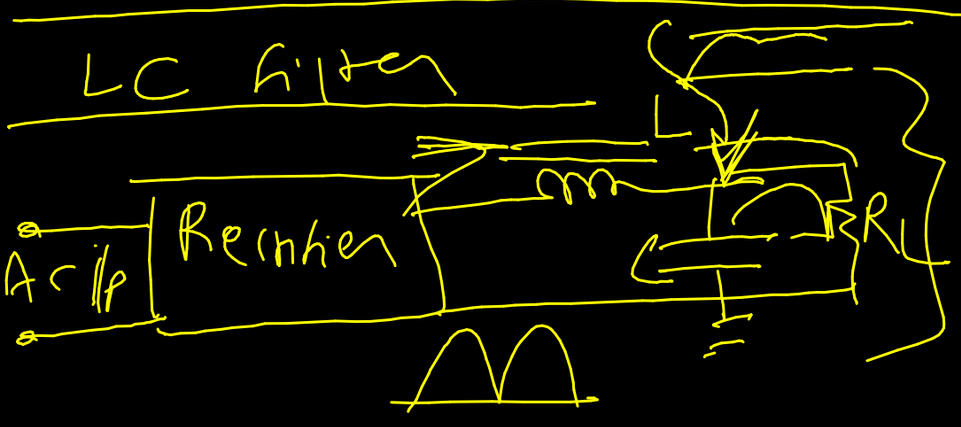
$X_L = 2\pi f L$

$f = 0$, $X_L = 0$

$f = \infty$ $X_L = \infty$

$$V = \frac{R_L}{3\sqrt{2}\,\omega L}$$

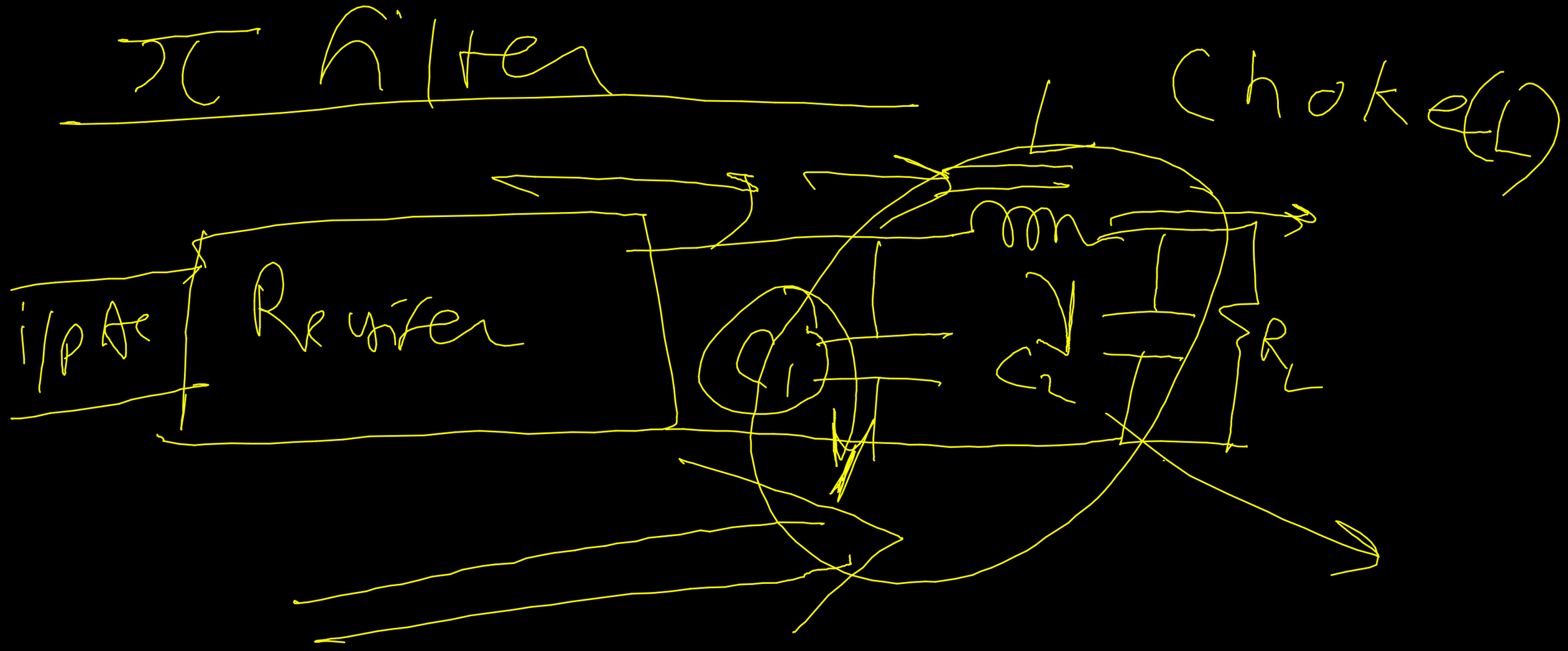
LC filter



For LC filter

$$V = \frac{\sqrt{2}}{3}\,\frac{X_C}{X_L}$$

π filter



π filter is having best ripple rejection capability

$$V = \frac{\sqrt{2}}{8\omega^3 L C_1 C_2 R_L}$$