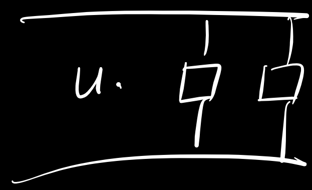
$$\frac{P}{\omega U^2}(\tan\varphi_1-\tan\varphi_2) = C$$

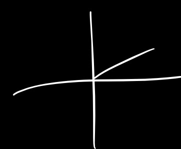


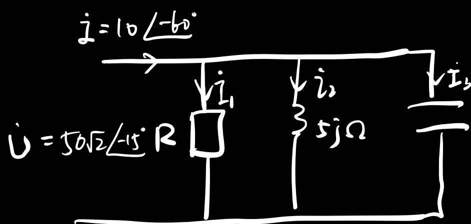
$I =$

$I_1 =$

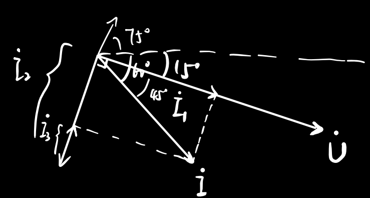
$$I_C = \frac{P\sin\varphi_1}{U\cos\varphi_1} - \frac{P\sin\varphi_2}{U\cos\varphi_2} = \frac{U}{\frac{1}{\omega C}} = U\omega C$$

$$C = \frac{P}{\omega U^2}(\tan\varphi_1-\tan\varphi_2)$$





$$\dot I_2 \cdot 5j = \dot U$$

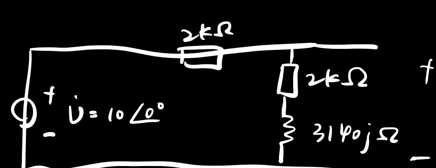


由图: $I_2 - I_3 = I_1 = \frac{\sqrt{2}}{2} I = 5\sqrt{2}$ A.

$$I_2 = \frac{U}{\omega L} = \frac{50\sqrt{2}}{5} = 10\sqrt{2}\ A$$

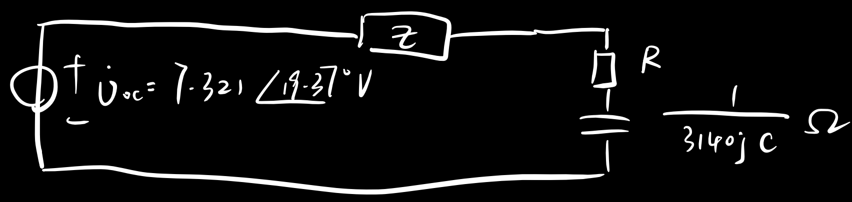
$\therefore I_3 = 5\sqrt{2}\ A \qquad \dot I_3 = 5\sqrt{2}\angle 75^\circ$

$\therefore i(t) = 10\sin(10^3 t + 75^\circ)\ A$



$$\dot U_{oc} = 10\angle 0^\circ \cdot \frac{2000+3140j}{4000+3140j} = 7.321\angle 19.37^\circ\ V$$

$$X_{eq}=\frac{2000(2000+3140j)}{2000+2000+3140j}=$$



$$\dot I=\frac{\dot U_{oc}}{X_{eq}+R+\frac{1}{3140jC}}=\frac{7.321\angle 19.37^\circ}{}$$

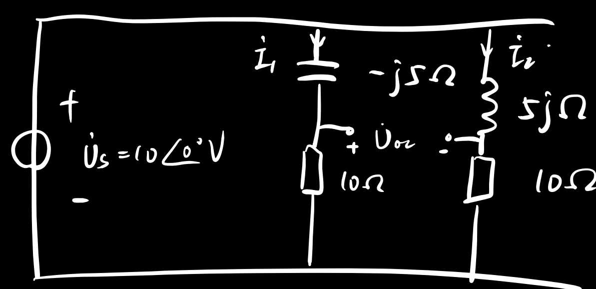
$$Z=1387.27+485.7j+R+\frac{1}{3140jC}$$

$|Z|_{min}$时，I_{max}，$j485.7+\frac{1}{3140jC}=0 \Rightarrow$

$$485.7C=\frac{1}{31400}$$

$$C=6.57\times10^{-7}F$$

$$=0.657\mu F.$$



$$\frac{(-5j)}{10-5j}\times 10+\dot U_{oc}=\frac{5j}{10+5j}\times 10$$

$$=0.$$

$$\dot U_{oc}=$$

$$\dot I_1=\frac{10\angle 0^\circ}{10-5j}=\frac{2}{\sqrt5}\angle 26.57^\circ$$

$$\dot I_2=\frac{10\angle 0^\circ}{5j+10}=\frac{2}{\sqrt5}\angle -26.57^\circ$$

$$\dot U_{oc}+10\dot I_2-10\dot I_1=0$$

$$\dot U_{oc}=8\angle 90^\circ V$$

$$Z_{eq}=10\,//\,5j=\frac{50j}{10+5j}=2\sqrt5\angle 63.43^\circ$$

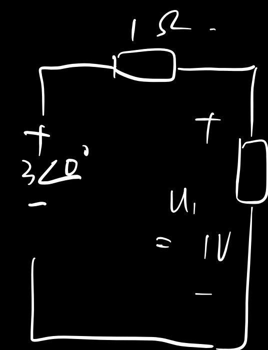
$\therefore Z_L = 2\sqrt{5}\angle 63.43^\circ\ \Omega$ 时

$$P_{Lmax} = \frac{|U|^2}{4|Z|} = \frac{8\sqrt{5}}{5}\ W$$

$$\dot{I}_1 \cdot (-j25) = \dot{I}_R(jX_L + 20) = \dot{U}$$

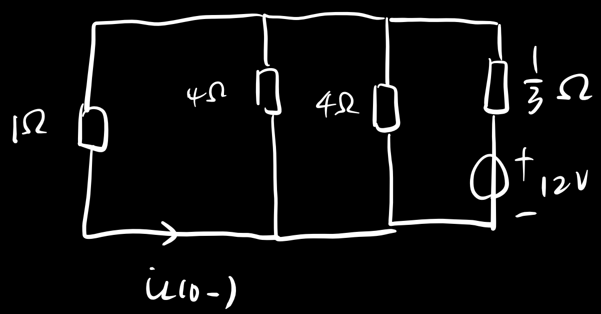
$\dot{I}_S = \dot{I}_1 + \dot{I}_R$ $\quad\quad$ $I_R = I_S$

$$I_R \cdot \sqrt{20^2 + X_L^2} =$$



$\frac{50}{100} = 0.5\Omega$

$$\left|20 + jX_L\right| = \left|\frac{(20+jX_L)\cdot(-25j)}{20+jX_L-25j}\right|$$



$$I_{T} = \frac{12}{\frac{1}{3}+1//4//4} = 12A.$$

$$i_L(0_-) = 12 \times \frac{2}{2+1} = 8A$$