EMag I. Prof. Xingwei Wang

Homework #4

Due day: Oct. 10(Wednesday) before class.

Problem 2.47 Use the Smith chart to find the reflection coefficient corresponding to a load impedance of

(a) $Z_L = 3Z_0$

(b) $Z_L = (2 - j2)Z_0$

(c) $Z_L = -j2Z_0$

(d) $Z_L = 0$ (short circuit)

Solution: Refer to Fig. P2.47.

(a) Point A is $z_L = 3 + j0$. $\Gamma = 0.5e^{0^\circ}$

(b) Point B is $z_L = 2 - j2$. $\Gamma = 0.62e^{-29.7^\circ}$

(c) Point C is $z_L = 0 - j2$. $\Gamma = 1.0e^{-53.1^\circ}$

(d) Point D is $z_L = 0 + j0$. $\Gamma = 1.0e^{180.0^\circ}$

Problem 2.49 Use the Smith chart to find the normalized load impedance corresponding to a reflection coefficient of

(a) $\Gamma = 0.5$

(b) $\Gamma = 0.5\angle 60^\circ$

(c) $\Gamma = -1$

(d) $\Gamma = 0.3\angle -30^\circ$

(e) $\Gamma = 0$

(f) $\Gamma = j$

(a) Point A' is $\Gamma = 0.5$ at $z_L = 3 + j0$.

(b) Point B' is $\Gamma = 0.5e^{j60^\circ}$ at $z_L = 1 + j1.15$.

(c) Point C' is $\Gamma = -1$ at $z_L = 0 + j0$.

(d) Point D' is $\Gamma = 0.3e^{-j30^\circ}$ at $z_L = 1.60 - j0.53$.

(e) Point E' is $\Gamma = 0$ at $z_L = 1 + j0$.

(f) Point F' is $\Gamma = j$ at $z_L = 0 + j1$.

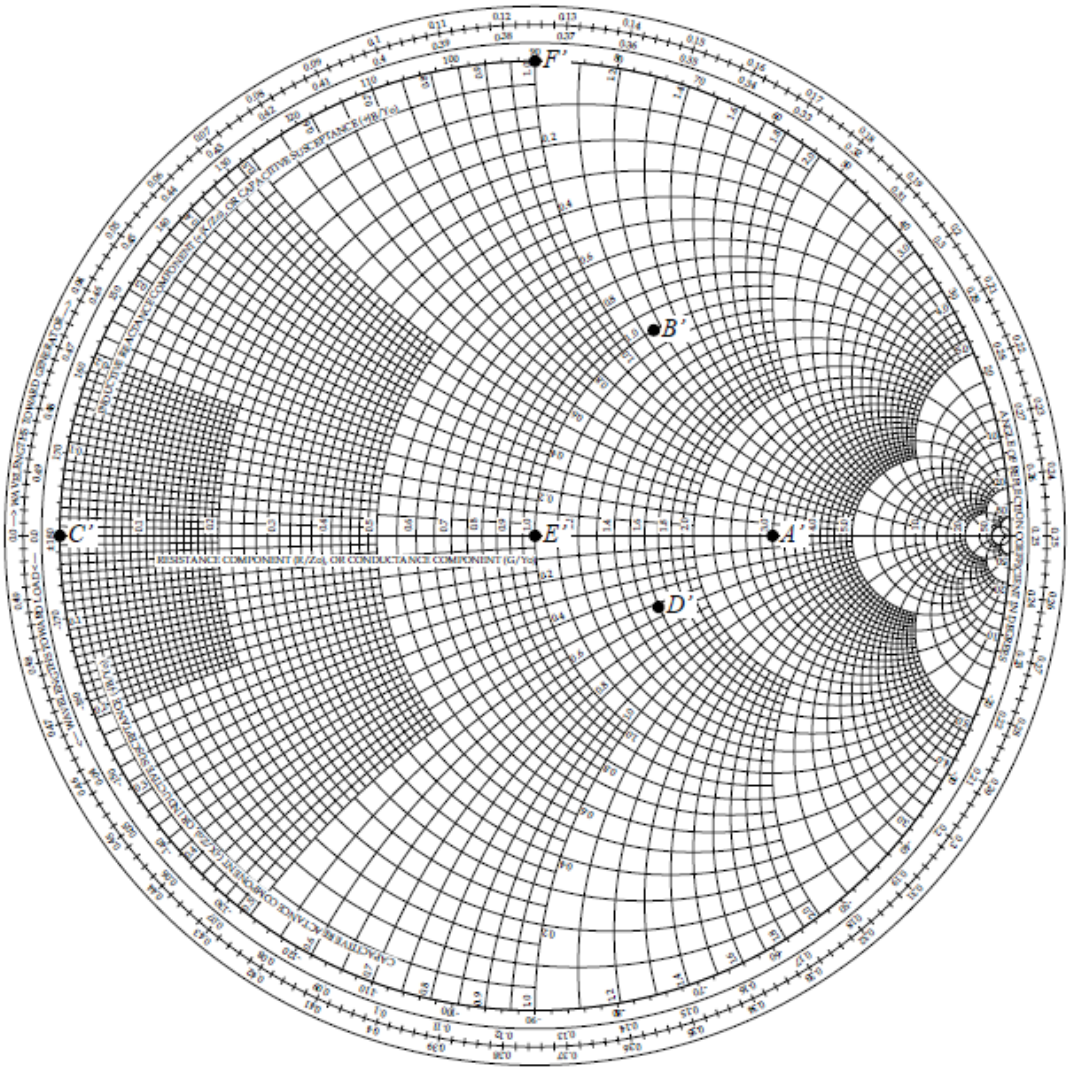

Figure P2.49: Solution of Problem 2.49.

Solution: Refer to Fig. P2.49.