

1. 定数計算のための予備知識

$$Q_s = \frac{X_{ls}}{R_s} = \frac{X_{cs}}{R_s} = \frac{1}{R_s} \sqrt{\frac{L}{C}} \tag{1}$$

$$Q_p = \frac{R_p}{X_{lp}} = \frac{R_p}{X_{cp}} = R_p \sqrt{\frac{C}{L}} \tag{2}$$

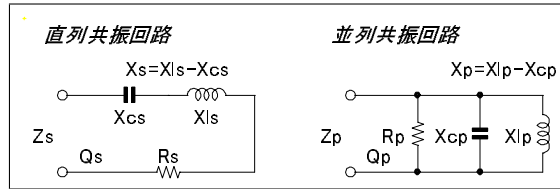


図 1: 素子の接続と定数の名称

$Q = Q_s = Q_p$  として直並列変換

$$R_p = (1 + Q^2) R_s \tag{3}$$

$$X_p = (1 + \frac{1}{Q^2}) X_s \neq X_s \tag{4}$$

2. C 分割共振回路の定数計算の手順

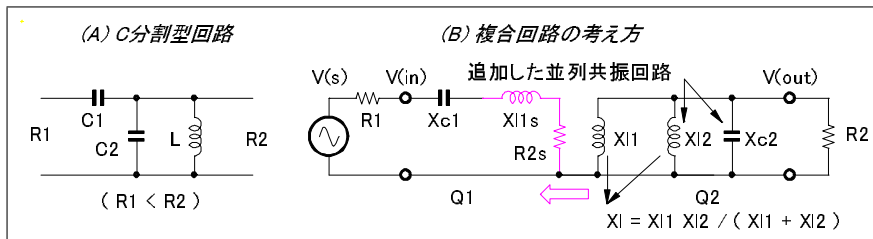


図 2: C 分割回路とその分解

$$Q_1 = \sqrt{\frac{R_2}{R_1} - 1} \tag{5}$$

$$X_{c1} = Q_1 R_1 \tag{6}$$

$$X_{l1} = \frac{R_2}{Q_1} \tag{7}$$

$$Q_2 = R_2 \sqrt{\frac{C}{L}} \quad \text{任意} \tag{8}$$

$$X_{l2} = \frac{R_2}{Q_2} \tag{9}$$

$$X_l = \frac{X_{l1} X_{l2}}{X_{l1} + X_{l2}} \tag{10}$$

チェック:  $V(in)/V(s) = 0.5$        $V(out)/V(s) = 1.58$

3.  $\pi$  型回路の定数計算の手順

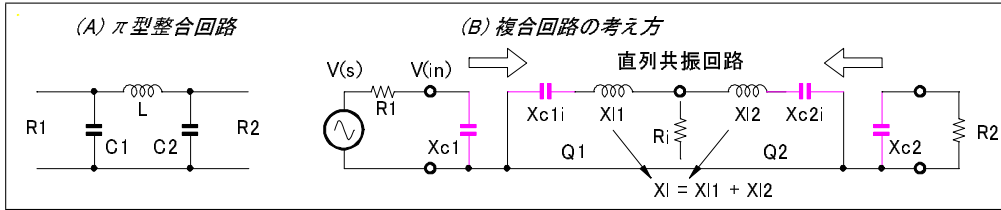


図 3:  $\pi$  型回路とその分解

$$Q_1 = 1 \quad (11)$$

$$X_{c1} = R_1 \quad (12)$$

$$Q_2 = \sqrt{\frac{2R_2}{R_1} - 1} \quad (13)$$

$$X_{c2} = \frac{R_2}{Q_2} \quad (14)$$

$$X_l = (1 + Q_2) \frac{R_1}{2} \quad (15)$$

チェック:  $V(in)/V(s) = 0.5$        $V(out)/V(s) = 1.58$

以上