16–11 Determine the capacitance of each chip capacitor in Fig. 16–34. Use the coding scheme in Fig. 16–17.

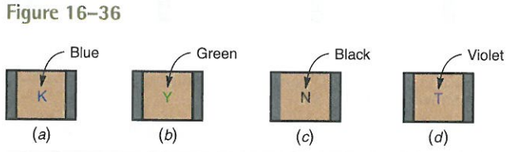
Figure 16–34

16–12 Determine the capacitance of each chip capacitor in Fig. 16–35. Use the coding scheme in Fig. 16–18.

Figure 16–35

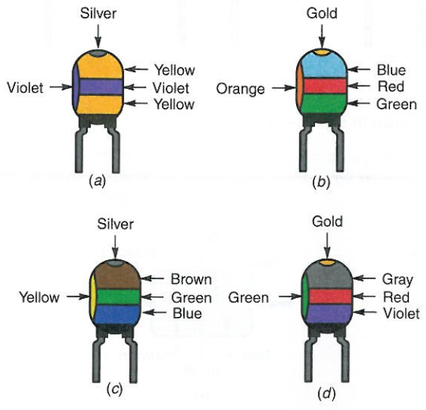
16–13 Determine the capacitance of each chip capacitor in Fig. 16–36.

Figure 16–36



16–14 Determine the capacitance and tolerance of each capacitor in Fig. 16–37.

Figure 16–37



16–15 Determine the permissible capacitance range of the capacitors in
- a. Fig. 16–31*a*.
- b. Fig. 16–31*d*.
- c. Fig. 16–31*f*.
- d. Fig. 16–32*c*.
- e. Fig. 16–32*d*.

16–16 Explain the alphanumeric code, Z5U, for the capacitor in Fig. 16–32*b*.

SECTION 16–7 PARALLEL CAPACITANCES

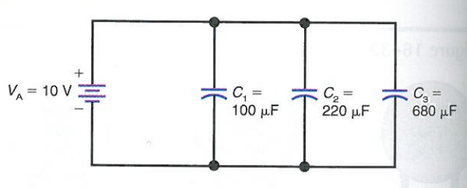
16–17 A 5-μF and 15-μF capacitor are in parallel. How much is C_T?

16–18 A 0.1-μF, 0.27-μF, and 0.01-μF capacitor are in parallel. How much is C_T?

16–19 A 150-pF, 330-pF, and 0.001-μF capacitor are in parallel. How much is C_T?

16–20 In Fig. 16–38,
- a. how much voltage is across each individual capacitor?
- b. how much charge is stored by C_1?
- c. how much charge is stored by C_2?
- d. how much charge is stored by C_3?
- e. what is the total charge stored by all capacitors?
- f. how much is C_T?

Figure 16–38



SECTION 16–8 SERIES CAPACITANCES

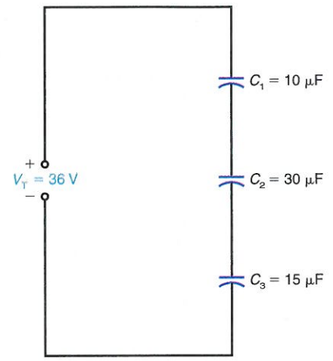
16–21 A 0.1-μF and 0.4-μF capacitor are in series. How much is the equivalent capacitance, C_{EQ}?

16–22 A 1500-pF and 0.001-μF capacitor are in series. How much is the equivalent capacitance, C_{EQ}?

16–23 A 0.082-μF, 0.047-μF, and 0.012 μF capacitor are in series. How much is the equivalent capacitance, C_{EQ}?

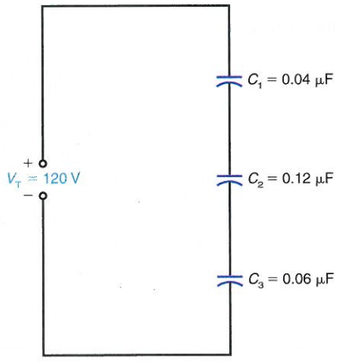
16–24 In Fig. 16–39, assume a charging current of 180 μA flows for 1 s. Solve for
- a. C_{EQ}.
- b. the charge stored by C_1, C_2, and C_3.
- c. the voltage across C_1, C_2, and C_3.
- d. the total charge stored by all capacitors.

Figure 16–39



16–25 In Fig. 16–40, assume a charging current of 2.4 mA flows for 1 ms. Solve for
- a. C_{EQ}.
- b. the charge stored by C_1, C_2, and C_3.
- c. the voltage across C_1, C_2, and C_3.
- d. the total charge stored by all capacitors.

Figure 16–40



16–26 How much capacitance must be connected in series with a 120-pF capacitor to obtain an equivalent capacitance, C_{EQ}, of 100 pF.

SECTION 16–9 ENERGY STORED IN ELECTROSTATIC FIELD OF CAPACITANCE

16–27 How much energy is stored by a 100-μF capacitor which is charged to
- a. 5 V?
- b. 10 V?
- c. 50 V?

16–28 How much energy is stored by a 0.027-μF capacitor which is charged to
- a. 20 V?
- b. 100 V?
- c. 500 V?

16–29 Calculate the energy stored by each capacitor in Fig. 16–39.

SECTION 16–10 MEASURING AND TESTING CAPACITORS

16–30 Make the following conversions:
- a. 0.047 μF to pF.
- b. 0.0015 μF to pF.
- c. 390,000 pF to μF.
- d. 1000 pF to μF.

16–31 Make the following conversions:
- a. 15 nf to pF.
- b. 1 nF to pF.
- c. 680 nF to pF.
- d. 33,000 pF to nF.
- e. 1,000,000 pF to nF.
- f. 560,000 pF to nF.

16–32 A plastic-film capacitor has a coded value of 154K. If the measured value of capacitance is 0.160 μF, is the capacitance value within tolerance?

16–33 A ceramic disk capacitor is coded 102Z. If the measured value of capacitance is 680 pF, is the capacitance within tolerance?

16–34 A plastic-film capacitor has a coded value of 229B. If the measured value of capacitance is 2.05 pF, is the capacitance within tolerance?

SECTION 16–11 TROUBLES IN CAPACITORS

16–35 What is the ohmmeter reading for a(n)
- a. shorted capacitor.
- b. open capacitor.
- c. leaky capacitor.

16–36 Describe the effect of connecting a 0.47-μF capacitor to the leads of an analog ohmmeter set to the $R \times$ 10K range.

Critical Thinking

16–37 Three capacitors in series have a combined equivalent capacitance C_{EQ} of 1.6 nF. If $C_1 = 4C_2$ and $C_3 = 20C_1$, calculate the values for C_1, C_2, and C_3.

16–38 A 100-pF ceramic capacitor has a temperature coefficient T_C of N500. Calculate its capacitance at (**a**) 75°C; (**b**) 125°C; (**c**) −25°C.