

Overview

The KEMET ALF80 Press-Fit capacitors eliminate the need for solder, and therefore, the associated production and quality issues. They are the next evolution of snap-in capacitors, providing reliable electrical contact and the same vibration performance as soldered snap-in terminals. The ALF80 High CV capacitors offer high performance and reliability in a wide range of case sizes and voltage ratings featuring high ripple currents and long-life performance. Volumetric efficiency ensures the maximum capacitance capability in a smaller size.

Applications

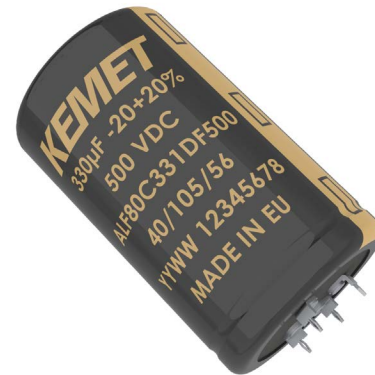
Typical applications for the ALF80 capacitor include inverters, frequency converters, motor drives, motor control, UPS systems, smoothing, energy storage, alternative energy, charging stations, traction, demanding power supplies (SMPS), welding, and HVAC.

Benefits

- Eliminates the manufacturing problems of soldering onto thick PCB copper tracks, which act as heat-sinks
- Eliminates fractured solder joints/cold-solder
- Skipping the solder operation allows for easy insertion after the production washing process
- Capability to exchange components in the field

In addition to solving the solder issues, the ALF80 Press-Fit offers:

- Maximum capacitance capability
- 35, 40, 45, and 50 mm diameters with 4 or 5 pin configuration
- Long life, up to 9,000 hours at +105°C (Vr, Ir applied)
- High ripple current
- Excellent surge voltage capability
- PET sleeve and Lexan disc are recognized to UL: QMTR2, UL No. E358957 (Other options available upon request)
- Optimized designs available upon request



Part Number System

| ALF80 | C | 331 | DF | 500 | |
|--------------------------------------|-----------------------|--|---------------------|--|---|
| Series | Termination | Capacitance Code (µF) | Size Code | Rated Voltage (VDC) | |
| Press-Fit Type Aluminum Electrolytic | See Termination Table | First two digits represent significant figures. Third digit specifies number of zeros. | See Dimension Table | 025 = 25 040 = 40 063 = 63 100 = 100 200 = 200 | 250 = 250 350 = 350 400 = 400 450 = 450 500 = 500 |

Built Into Tomorrow

Performance Characteristics

| Item | Performance Characteristics | | |
|-------------------------------|--|---|--|
| Capacitance Range | 200 – 240,000 μ F | | |
| Rated Voltage | 25 – 500 VDC | | |
| Operating Temperature | -40 to +105°C | | |
| Storage Temperature Range | -55 to +105°C | | |
| Capacitance Tolerance | \pm 20% at 100 Hz/+20°C | | |
| Operational Lifetime | D (mm) | Rated Voltage and Ripple Current at +105°C (hours) | Rated Voltage at +105°C (hours) |
| | 35 | 8,000 | 13,000 |
| | 40 – 50 | 9,000 | 14,000 |
| End of Life Requirement | $40 < V_R \leq 160$ VDC Δ C/C < \pm 20% $V_R > 160$ VDC Δ C/C < \pm 15% ESR < 3X ESR Limit, IL < initial specified limit | | |
| Shelf Life | 2,000 hours at +85°C or 30,000 hours at +40°C 0 VDC | | |
| Leakage Current | I = 0.003 CV or 6,000 μ A (whichever is smaller) | | |
| | C = rated capacitance (μ F), V = rated voltage (VDC). Voltage applied for 5 minutes at +20°C. | | |
| Vibration Test Specifications | Procedure | | Requirements |
| | D \leq 40 mm | 0.75 mm displacement amplitude or 10 G maximum acceleration. Vibration applied for three directions 2-hour sessions at 10 – 500 Hz. (Capacitor clamped by body) | No leakage of electrolyte or other visible damage. Deviations in capacitance from initial measurements must not exceed Δ C/C \pm 5% |
| | D > 40 mm | 0.35 mm displacement amplitude or 5 G maximum acceleration. Vibration applied for three directions 0.5-hour sessions at 10 – 55 Hz. (Capacitor clamped by body) | |
| Standards | IEC 60384-4 long life grade 40/105/56 | | |

Surge Voltage

| Test Condition | Voltage (VDC) | | | | | | | | | |
|--|---------------|----|------|-----|-----|-----|-----|-----|-----|-----|
| | 25 | 40 | 63 | 100 | 200 | 250 | 350 | 400 | 450 | 500 |
| \leq 30 second surge followed by a no load period of 330 seconds, 1,000 cycles at +105°C | 28.75 | 46 | 72.5 | 115 | 230 | 288 | 385 | 440 | 495 | 550 |

Test Method & Performance

| Endurance Life Test | | |
|------------------------------|--|---------------------------------|
| Conditions | Performance | |
| Temperature | +105°C | |
| Test Duration | 2,000 hours | |
| Ripple Current | Rated ripple current specified in table | |
| Voltage | The sum of DC voltage and the peak AC voltage must not exceed the rated voltage of the capacitor | |
| Performance | The following specifications will be satisfied when the capacitor is tested at +20°C: | |
| Capacitance Change | ≤ 160 V | Within 15% of the initial value |
| | > 160 V | Within 10% of the initial value |
| Equivalent Series Resistance | Does not exceed 150% of the initial value | |
| Leakage Current | Does not exceed leakage current limit | |

Dimensions – Millimeters

| Size Code | Dimensions in mm | | Safety Vent Construction | Approximate Weight Grams |
|-----------|------------------|-----|--------------------------|--------------------------|
| | D | L | | |
| | -0/+1 | ±2 | | |
| DB | 35 | 30 | Base Vent | 50 |
| DC | 35 | 35 | | 60 |
| DD | 35 | 40 | | 65 |
| DE | 35 | 45 | | 75 |
| DF | 35 | 50 | | 80 |
| DG | 35 | 55 | | 85 |
| DH | 35 | 60 | | 90 |
| DL | 35 | 80 | | 115 |
| EB | 40 | 30 | | 55 |
| EC | 40 | 35 | | 65 |
| ED | 40 | 40 | | 85 |
| EE | 40 | 45 | | 100 |
| EF | 40 | 50 | | 105 |
| EG | 40 | 55 | | 115 |
| EH | 40 | 60 | | 125 |
| EJ | 40 | 70 | | 145 |
| EL | 40 | 80 | | 165 |
| EM | 40 | 90 | | 180 |
| EN | 40 | 100 | | 195 |

Note: Dimensions include sleeving

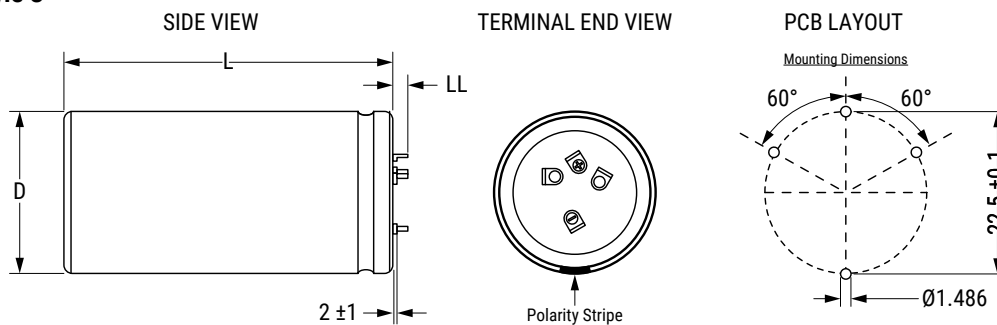
| Size Code | Dimensions in mm | | Safety Vent Construction | Approximate Weight Grams |
|-----------|------------------|-----|--------------------------|--------------------------|
| | D | L | | |
| | -0/+1 | ±2 | | |
| FB | 45 | 30 | Side Vent | 75 |
| FC | 45 | 35 | | 85 |
| FD | 45 | 40 | | 100 |
| FE | 45 | 45 | | 115 |
| FF | 45 | 50 | | 125 |
| FG | 45 | 55 | | 135 |
| FH | 45 | 60 | | 155 |
| FL | 45 | 80 | | 185 |
| FP | 45 | 105 | | 225 |
| KB | 50 | 30 | | 95 |
| KC | 50 | 35 | | 115 |
| KD | 50 | 40 | | 130 |
| KE | 50 | 45 | | 145 |
| KF | 50 | 50 | | 160 |
| KG | 50 | 55 | | 180 |
| KH | 50 | 60 | | 200 |
| KL | 50 | 80 | | 265 |
| KP | 50 | 105 | | 310 |

Note: Dimensions include sleeving

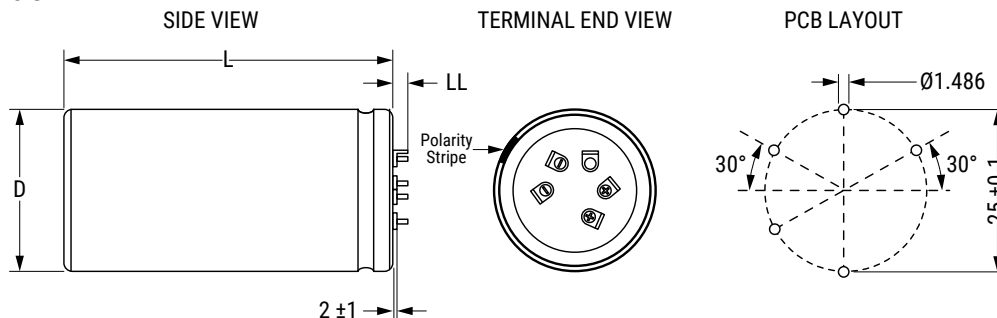
Termination Tables

| Termination Code | C (4 Pin) LL = 5.5 ±1 | G (5 Pin) LL = 5.5 ±1 |
|--|-----------------------------|-----------------------------|
| Diameter (mm) | | |
| 35 | • | |
| 40 | • | • |
| 45 | • | • |
| 50 | • | • |
| Dimensions in mm | | |
| <p>Mounting: These capacitors are designed to be mounted by their terminations alone and may be used in any position. Dummy pins must be isolated on 4 and 5 pin styles.</p> | | |

Style C



Style G



| | | |
|---|---------------|--------------|
| PCB Thickness: 1.57 mm Minimum | | |
| DRILL | Ø1.613 ±0.025 | |
| COPPER THICKNESS | 0.025 minimum | |
| FINAL PLATED THROUGH-HOLE DIAMETER | Ø1.486 ±0.076 | |
| Pin Insertion Force: 125 N (28 lbf) maximum Pin Retention Force: 62 N (14 lbf) minimum | | (Drill Hole) |

Shelf Life

The capacitance, ESR, and impedance of a capacitor will not change significantly after extended storage periods; however, the leakage current will very slowly increase. KEMET products are particularly stable and allow a shelf life in excess of three years at 40°C. See sectional specification under each product series for specific data.

Re-age (Reforming) Procedure

Apply the rated voltage to the capacitor at room temperature for a period of one hour or until the leakage current has fallen to a steady value below the specified limit. During re-aging, a maximum charging current of twice the specified leakage current or 5 mA (whichever is greater) is suggested.

Reliability

The reliability of a component can be defined as the probability that it will perform satisfactorily under a given set of conditions for a given length of time.

In practice, it is impossible to predict with absolute certainty how any individual component will perform. Therefore, we must utilize probability theory. It is also necessary to clearly define the level of stress involved (e.g., operating voltage, ripple current, temperature, and time.) Finally, the meaning of satisfactory performance must be defined by specifying a set of conditions, which determine the end of life of the component.

KEMET provides an online life calculator that can be used to predict hours of life for a given part number in specific application conditions. This can be found at: <https://elc.kemet.com>.

End of Life Definition

Catastrophic failure: short circuit, open circuit or safety vent operation

Parametric Failure:

- Change in capacitance > $\pm 15\%$
- Leakage current > initial specified limit
- ESR > 3X ESR Limit

Table 1 – Ratings & Part Number Reference

| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR Maximum | Impedance Maximum | Part Number |
|-----|---------------------|-----------|------------|---------------------|---------------------|---------------------|---------------------|------------------|
| | 100 Hz 20°C (µF) | | D x L (mm) | 100 Hz 105°C (A) | 10 kHz 105°C (A) | 100 Hz 20°C (mΩ) | 10 kHz 20°C (mΩ) | |
| 25 | 27,000 | DC | 35 x 35 | 7.28 | 8.75 | 47 | 41 | ALF80C273DC025 |
| 25 | 30,000 | EB | 40 x 30 | 6.75 | 7.64 | 49 | 44 | ALF80(1)303EB025 |
| 25 | 33,000 | DD | 35 x 40 | 8.19 | 9.78 | 39 | 34 | ALF80C333DD025 |
| 25 | 39,000 | DE | 35 x 45 | 9.00 | 10.67 | 33 | 29 | ALF80C393DE025 |
| 25 | 47,000 | DF | 35 x 50 | 9.79 | 11.43 | 28 | 25 | ALF80C473DF025 |
| 25 | 56,000 | DH | 35 x 60 | 10.93 | 12.70 | 24 | 21 | ALF80C563DH025 |
| 25 | 62,000 | EF | 40 x 50 | 10.50 | 11.74 | 25 | 22 | ALF80(1)623EF025 |
| 25 | 68,000 | EF | 40 x 50 | 10.50 | 11.59 | 24 | 22 | ALF80(1)683EF025 |
| 25 | 82,000 | EH | 40 x 60 | 11.85 | 13.05 | 20 | 18 | ALF80(1)823EH025 |
| 25 | 100,000 | EJ | 40 x 70 | 12.92 | 14.10 | 17 | 16 | ALF80(1)104EJ025 |
| 25 | 110,000 | EL | 40 x 80 | 13.66 | 14.88 | 16 | 15 | ALF80(1)114EL025 |
| 25 | 120,000 | EL | 40 x 80 | 13.78 | 14.87 | 15 | 14 | ALF80(1)124EL025 |
| 25 | 150,000 | EN | 40 x 100 | 14.81 | 15.81 | 14 | 12 | ALF80(1)154EN025 |
| 25 | 180,000 | FP | 45 x 105 | 18.82 | 20.45 | 10 | 9 | ALF80(1)184FP025 |
| 25 | 220,000 | KP | 50 x 105 | 19.80 | 21.16 | 9 | 9 | ALF80(1)224KP025 |
| 25 | 240,000 | KP | 50 x 105 | 20.06 | 21.29 | 9 | 8 | ALF80(1)244KP025 |
| 40 | 12,000 | DC | 35 x 35 | 6.74 | 8.65 | 47 | 39 | ALF80C123DC040 |
| 40 | 12,000 | EB | 40 x 30 | 6.31 | 7.66 | 53 | 44 | ALF80(1)123EB040 |
| 40 | 13,000 | DD | 35 x 40 | 7.44 | 9.76 | 43 | 35 | ALF80C133DD040 |
| 40 | 15,000 | DE | 35 x 45 | 8.15 | 10.65 | 37 | 30 | ALF80C153DE040 |
| 40 | 18,000 | DF | 35 x 50 | 8.91 | 11.41 | 32 | 26 | ALF80C183DF040 |
| 40 | 20,000 | DF | 35 x 50 | 9.10 | 11.36 | 30 | 25 | ALF80C203DF040 |
| 40 | 22,000 | DG | 35 x 55 | 9.69 | 12.06 | 27 | 23 | ALF80C223DG040 |
| 40 | 27,000 | EF | 40 x 50 | 9.90 | 11.60 | 26 | 22 | ALF80(1)273EF040 |
| 40 | 33,000 | EH | 40 x 60 | 11.19 | 13.02 | 21 | 18 | ALF80(1)333EH040 |
| 40 | 39,000 | EJ | 40 x 70 | 12.20 | 14.07 | 19 | 16 | ALF80(1)393EJ040 |
| 40 | 47,000 | EL | 40 x 80 | 13.06 | 14.81 | 17 | 14 | ALF80(1)473EL040 |
| 40 | 56,000 | EN | 40 x 100 | 13.94 | 15.62 | 15 | 13 | ALF80(1)563EN040 |
| 40 | 68,000 | FP | 45 x 105 | 17.50 | 20.12 | 11 | 9 | ALF80(1)683FP040 |
| 40 | 82,000 | FP | 45 x 105 | 18.33 | 20.56 | 10 | 9 | ALF80(1)823FP040 |
| 40 | 100,000 | KP | 50 x 105 | 19.33 | 21.19 | 9 | 8 | ALF80(1)104KP040 |
| 63 | 6,800 | DC | 35 x 35 | 5.80 | 8.08 | 56 | 42 | ALF80C682DC063 |
| 63 | 7,500 | DC | 35 x 35 | 5.90 | 7.97 | 53 | 41 | ALF80C752DC063 |
| 63 | 7,500 | EB | 40 x 30 | 5.52 | 6.95 | 60 | 48 | ALF80(1)752EB063 |
| 63 | 8,200 | EB | 40 x 30 | 5.53 | 6.78 | 58 | 46 | ALF80(1)822EB063 |
| 63 | 9,100 | DD | 35 x 40 | 6.68 | 8.96 | 44 | 34 | ALF80C912DD063 |
| 63 | 10,000 | DE | 35 x 45 | 7.29 | 9.90 | 40 | 30 | ALF80C103DE063 |
| 63 | 12,000 | DF | 35 x 50 | 7.99 | 10.62 | 34 | 26 | ALF80C123DF063 |
| 63 | 15,000 | DH | 35 x 60 | 9.09 | 11.88 | 28 | 21 | ALF80C153DH063 |
| 63 | 18,000 | EF | 40 x 50 | 8.82 | 10.54 | 28 | 23 | ALF80(1)183EF063 |
| 63 | 22,000 | EH | 40 x 60 | 10.07 | 11.97 | 24 | 19 | ALF80(1)223EH063 |
| 63 | 27,000 | EJ | 40 x 70 | 11.12 | 13.02 | 20 | 17 | ALF80(1)273EJ063 |
| 63 | 30,000 | EL | 40 x 80 | 11.89 | 13.89 | 18 | 15 | ALF80(1)303EL063 |
| 63 | 33,000 | EL | 40 x 80 | 12.01 | 13.80 | 18 | 15 | ALF80(1)333EL063 |
| 63 | 39,000 | EN | 40 x 100 | 13.06 | 14.90 | 16 | 13 | ALF80(1)393EN063 |
| 63 | 47,000 | FP | 45 x 105 | 16.50 | 19.48 | 11 | 9 | ALF80(1)473FP063 |
| 63 | 51,000 | FP | 45 x 105 | 16.83 | 19.59 | 11 | 9 | ALF80(1)513FP063 |
| 63 | 56,000 | KP | 50 x 105 | 17.46 | 20.02 | 11 | 9 | ALF80(1)563KP063 |
| 63 | 62,000 | KP | 50 x 105 | 17.79 | 20.09 | 10 | 9 | ALF80(1)623KP063 |
| 63 | 68,000 | KP | 50 x 105 | 18.03 | 20.09 | 10 | 9 | ALF80(1)683KP063 |
| 100 | 2,700 | DC | 35 x 35 | 4.83 | 6.69 | 110 | 90 | ALF80C272DC100 |
| 100 | 3,000 | DC | 35 x 35 | 4.94 | 6.65 | 102 | 84 | ALF80C302DC100 |
| 100 | 3,000 | EB | 40 x 30 | 4.66 | 5.88 | 111 | 94 | ALF80(1)302EB100 |
| 100 | 3,600 | DD | 35 x 40 | 5.60 | 7.53 | 85 | 70 | ALF80C362DD100 |
| 100 | 3,900 | DE | 35 x 45 | 6.09 | 8.33 | 77 | 63 | ALF80C392DE100 |
| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR | Impedance | Part Number |

(1) Termination code: See Termination Tables for available options.

Table 1 – Ratings & Part Number Reference cont.

| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR Maximum | Impedance Maximum | Part Number |
|-----|---------------------|-----------|------------|---------------------|---------------------|---------------------|---------------------|------------------|
| | 100 Hz 20°C (µF) | | D x L (mm) | 100 Hz 105°C (A) | 10 kHz 105°C (A) | 100 Hz 20°C (mΩ) | 10 kHz 20°C (mΩ) | |
| 100 | 4,700 | DF | 35 x 50 | 6.73 | 9.03 | 65 | 54 | ALF80C472DF100 |
| 100 | 5,600 | DG | 35 x 55 | 7.35 | 9.66 | 56 | 46 | ALF80C562DG100 |
| 100 | 6,800 | EF | 40 x 50 | 7.56 | 9.25 | 52 | 44 | ALF80(1)682EF100 |
| 100 | 8,200 | EH | 40 x 60 | 8.65 | 10.59 | 43 | 36 | ALF80(1)822EH100 |
| 100 | 10,000 | EJ | 40 x 70 | 9.63 | 11.63 | 36 | 31 | ALF80(1)103EJ100 |
| 100 | 12,000 | EL | 40 x 80 | 10.47 | 12.45 | 31 | 27 | ALF80(1)123EL100 |
| 100 | 15,000 | EN | 40 x 100 | 11.60 | 13.59 | 26 | 22 | ALF80(1)153EN100 |
| 100 | 18,000 | FP | 45 x 105 | 14.51 | 17.67 | 20 | 17 | ALF80(1)183FP100 |
| 100 | 20,000 | FP | 45 x 105 | 14.96 | 17.86 | 18 | 16 | ALF80(1)203FP100 |
| 100 | 22,000 | KP | 50 x 105 | 15.60 | 18.32 | 18 | 15 | ALF80(1)223KP100 |
| 100 | 24,000 | KP | 50 x 105 | 15.90 | 18.40 | 17 | 15 | ALF80(1)243KP100 |
| 200 | 910 | DC | 35 x 35 | 2.77 | 5.77 | 237 | 144 | ALF80C911DC200 |
| 200 | 1,000 | EB | 40 x 30 | 2.90 | 5.39 | 228 | 142 | ALF80(1)102EB200 |
| 200 | 1,200 | DD | 35 x 40 | 3.27 | 6.61 | 182 | 111 | ALF80C122DD200 |
| 200 | 1,500 | DF | 35 x 50 | 3.85 | 7.86 | 145 | 86 | ALF80C152DF200 |
| 200 | 1,600 | DF | 35 x 50 | 3.97 | 7.94 | 137 | 84 | ALF80C162DF200 |
| 200 | 1,800 | DG | 35 x 55 | 4.30 | 8.52 | 122 | 73 | ALF80C182DG200 |
| 200 | 2,200 | EF | 40 x 50 | 4.81 | 8.60 | 106 | 66 | ALF80(1)222EF200 |
| 200 | 2,700 | EH | 40 x 60 | 5.53 | 9.82 | 86 | 54 | ALF80(1)272EH200 |
| 200 | 3,300 | EJ | 40 x 70 | 6.26 | 10.84 | 72 | 44 | ALF80(1)332EJ200 |
| 200 | 3,900 | EL | 40 x 80 | 6.90 | 11.67 | 62 | 39 | ALF80(1)392EL200 |
| 200 | 4,700 | EN | 40 x 100 | 7.67 | 12.71 | 52 | 33 | ALF80(1)472EN200 |
| 200 | 5,600 | FP | 45 x 105 | 9.00 | 16.01 | 42 | 26 | ALF80(1)562FP200 |
| 200 | 6,800 | FP | 45 x 105 | 9.99 | 16.71 | 36 | 23 | ALF80(1)682FP200 |
| 200 | 8,200 | KP | 50 x 105 | 11.15 | 17.54 | 31 | 20 | ALF80(1)822KP200 |
| 250 | 620 | DC | 35 x 35 | 2.50 | 5.53 | 286 | 170 | ALF80C621DC250 |
| 250 | 620 | EB | 40 x 30 | 2.54 | 5.21 | 296 | 178 | ALF80(1)621EB250 |
| 250 | 680 | EB | 40 x 30 | 2.64 | 5.23 | 274 | 159 | ALF80(1)681EB250 |
| 250 | 750 | DD | 35 x 40 | 2.84 | 6.26 | 237 | 141 | ALF80C751DD250 |
| 250 | 820 | DE | 35 x 45 | 3.06 | 6.81 | 216 | 122 | ALF80C821DE250 |
| 250 | 1,000 | DF | 35 x 50 | 3.46 | 7.52 | 178 | 106 | ALF80C102DF250 |
| 250 | 1,200 | DG | 35 x 55 | 3.86 | 8.19 | 150 | 86 | ALF80C122DG250 |
| 250 | 1,500 | EF | 40 x 50 | 4.41 | 8.39 | 126 | 77 | ALF80(1)152EF250 |
| 250 | 1,800 | EH | 40 x 60 | 5.02 | 9.57 | 105 | 64 | ALF80(1)182EH250 |
| 250 | 2,200 | EJ | 40 x 70 | 5.70 | 10.60 | 87 | 51 | ALF80(1)222EJ250 |
| 250 | 2,700 | EL | 40 x 80 | 6.42 | 11.50 | 72 | 45 | ALF80(1)272EL250 |
| 250 | 3,300 | EN | 40 x 100 | 7.22 | 12.62 | 60 | 36 | ALF80(1)332EN250 |
| 250 | 3,900 | FP | 45 x 105 | 8.42 | 15.83 | 49 | 29 | ALF80(1)392FP250 |
| 250 | 4,300 | FP | 45 x 105 | 8.89 | 16.22 | 45 | 28 | ALF80(1)432FP250 |
| 250 | 4,700 | KP | 50 x 105 | 9.52 | 16.86 | 42 | 25 | ALF80(1)472KP250 |
| 250 | 5,600 | KP | 50 x 105 | 10.40 | 17.38 | 37 | 23 | ALF80(1)562KP250 |
| 350 | 360 | DC | 35 x 35 | 2.04 | 5.36 | 381 | 201 | ALF80C361DC350 |
| 350 | 390 | EB | 40 x 30 | 2.16 | 5.17 | 364 | 195 | ALF80(1)391EB350 |
| 350 | 430 | DD | 35 x 40 | 2.30 | 6.05 | 319 | 168 | ALF80C431DD350 |
| 350 | 470 | DD | 35 x 40 | 2.41 | 6.18 | 294 | 140 | ALF80C471DD350 |
| 350 | 560 | DE | 35 x 45 | 2.70 | 6.87 | 247 | 118 | ALF80C561DE350 |
| 350 | 620 | DF | 35 x 50 | 2.91 | 7.42 | 223 | 118 | ALF80C621DF350 |
| 350 | 680 | DG | 35 x 55 | 3.11 | 7.91 | 203 | 97 | ALF80C681DG350 |
| 350 | 820 | EF | 40 x 50 | 3.54 | 8.25 | 175 | 94 | ALF80(1)821EF350 |
| 350 | 1,000 | EH | 40 x 60 | 4.06 | 9.38 | 143 | 70 | ALF80(1)102EH350 |
| 350 | 1,100 | EH | 40 x 60 | 4.26 | 9.52 | 132 | 71 | ALF80(1)112EH350 |
| 350 | 1,200 | EJ | 40 x 70 | 4.57 | 10.35 | 120 | 59 | ALF80(1)122EJ350 |
| 350 | 1,500 | EL | 40 x 80 | 5.22 | 11.29 | 98 | 49 | ALF80(1)152EL350 |
| 350 | 1,600 | EL | 40 x 80 | 5.40 | 11.41 | 92 | 51 | ALF80(1)162EL350 |
| 350 | 1,800 | EN | 40 x 100 | 5.81 | 12.27 | 82 | 41 | ALF80(1)182EN350 |
| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR | Impedance | Part Number |

(1) Termination code: See Termination Tables for available options

Table 1 – Ratings & Part Number Reference cont.

| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR Maximum | Impedance Maximum | Part Number |
|-----|---------------------|-----------|------------|---------------------|---------------------|---------------------|---------------------|------------------|
| | 100 Hz 20°C (µF) | | D x L (mm) | 100 Hz 105°C (A) | 10 kHz 105°C (A) | 100 Hz 20°C (mΩ) | 10 kHz 20°C (mΩ) | |
| 350 | 2,200 | FP | 45 x 105 | 6.81 | 15.31 | 66 | 32 | ALF80(1)222FP350 |
| 350 | 2,400 | FP | 45 x 105 | 7.19 | 15.72 | 61 | 33 | ALF80(1)242FP350 |
| 350 | 2,700 | FP | 45 x 105 | 7.71 | 16.23 | 55 | 28 | ALF80(1)272FP350 |
| 350 | 3,300 | KP | 50 x 105 | 8.81 | 17.27 | 47 | 26 | ALF80(1)332KP350 |
| 400 | 300 | DC | 35 x 35 | 1.93 | 5.34 | 408 | 210 | ALF80C301DC400 |
| 400 | 330 | EB | 40 x 30 | 2.07 | 5.16 | 384 | 200 | ALF80(1)331EB400 |
| 400 | 390 | DD | 35 x 40 | 2.28 | 6.15 | 316 | 163 | ALF80C391DD400 |
| 400 | 470 | DE | 35 x 45 | 2.58 | 6.85 | 263 | 118 | ALF80C471DE400 |
| 400 | 510 | DF | 35 x 50 | 2.74 | 7.36 | 242 | 125 | ALF80C511DF400 |
| 400 | 560 | DG | 35 x 55 | 2.93 | 7.85 | 220 | 99 | ALF80C561DG400 |
| 400 | 680 | EF | 40 x 50 | 3.36 | 8.22 | 187 | 98 | ALF80(1)681EF400 |
| 400 | 820 | EH | 40 x 60 | 3.82 | 9.33 | 156 | 71 | ALF80(1)821EH400 |
| 400 | 910 | EH | 40 x 60 | 4.04 | 9.48 | 142 | 75 | ALF80(1)911EH400 |
| 400 | 1,000 | EJ | 40 x 70 | 4.34 | 10.32 | 128 | 60 | ALF80(1)102EJ400 |
| 400 | 1,200 | EL | 40 x 80 | 4.85 | 11.17 | 108 | 51 | ALF80(1)122EL400 |
| 400 | 1,300 | EL | 40 x 80 | 5.07 | 11.34 | 101 | 54 | ALF80(1)132EL400 |
| 400 | 1,500 | EN | 40 x 100 | 5.53 | 12.23 | 88 | 42 | ALF80(1)152EN400 |
| 400 | 1,800 | FP | 45 x 105 | 6.40 | 15.15 | 71 | 33 | ALF80(1)182FP400 |
| 400 | 2,200 | FP | 45 x 105 | 7.24 | 16.09 | 60 | 32 | ALF80(1)222FP400 |
| 400 | 2,700 | KP | 50 x 105 | 8.32 | 17.17 | 50 | 27 | ALF80(1)272KP400 |
| 450 | 240 | DC | 35 x 35 | 1.81 | 5.09 | 541 | 311 | ALF80C241DC450 |
| 450 | 270 | EB | 40 x 30 | 1.96 | 4.99 | 496 | 288 | ALF80(1)271EB450 |
| 450 | 300 | DD | 35 x 40 | 2.09 | 5.81 | 434 | 250 | ALF80C301DD450 |
| 450 | 330 | DE | 35 x 45 | 2.25 | 6.32 | 394 | 205 | ALF80C331DE450 |
| 450 | 390 | DF | 35 x 50 | 2.51 | 6.94 | 334 | 174 | ALF80C391DF450 |
| 450 | 430 | DF | 35 x 50 | 2.65 | 7.14 | 304 | 176 | ALF80C431DF450 |
| 450 | 470 | DG | 35 x 55 | 2.82 | 7.62 | 278 | 146 | ALF80C471DG450 |
| 450 | 560 | EF | 40 x 50 | 3.20 | 7.97 | 240 | 140 | ALF80(1)561EF450 |
| 450 | 680 | EH | 40 x 60 | 3.66 | 9.07 | 198 | 105 | ALF80(1)681EH450 |
| 450 | 750 | EH | 40 x 60 | 3.86 | 9.23 | 181 | 106 | ALF80(1)751EH450 |
| 450 | 820 | EJ | 40 x 70 | 4.14 | 10.03 | 165 | 88 | ALF80(1)821EJ450 |
| 450 | 1,000 | EL | 40 x 80 | 4.67 | 10.92 | 136 | 73 | ALF80(1)102EL450 |
| 450 | 1,100 | EL | 40 x 80 | 4.92 | 11.12 | 125 | 74 | ALF80(1)112EL450 |
| 450 | 1,200 | EN | 40 x 100 | 5.20 | 11.88 | 114 | 62 | ALF80(1)122EN450 |
| 450 | 1,500 | FP | 45 x 105 | 6.25 | 14.04 | 109 | 70 | ALF80(1)152FP450 |
| 450 | 1,800 | KP | 50 x 105 | 7.13 | 15.27 | 93 | 57 | ALF80(1)182KP450 |
| 450 | 2,000 | KP | 50 x 105 | 7.58 | 15.77 | 84 | 55 | ALF80(1)202KP450 |
| 500 | 200 | DC | 35 x 35 | 1.71 | 4.40 | 851 | 589 | ALF80C201DC500 |
| 500 | 220 | EB | 40 x 30 | 1.84 | 4.40 | 791 | 549 | ALF80(1)221EB500 |
| 500 | 240 | DD | 35 x 40 | 1.93 | 4.97 | 709 | 491 | ALF80C241DD500 |
| 500 | 270 | DE | 35 x 45 | 2.10 | 5.43 | 630 | 420 | ALF80C271DE500 |
| 500 | 330 | DF | 35 x 50 | 2.39 | 6.07 | 517 | 358 | ALF80C331DF500 |
| 500 | 390 | DG | 35 x 55 | 2.66 | 6.66 | 438 | 293 | ALF80C391DG500 |
| 500 | 470 | EF | 40 x 50 | 3.04 | 7.12 | 372 | 259 | ALF80(1)471EF500 |
| 500 | 560 | EH | 40 x 60 | 3.44 | 8.08 | 312 | 209 | ALF80(1)561EH500 |
| 500 | 620 | EH | 40 x 60 | 3.64 | 8.29 | 283 | 197 | ALF80(1)621EH500 |
| 500 | 680 | EJ | 40 x 70 | 3.91 | 9.00 | 258 | 173 | ALF80(1)681EJ500 |
| 500 | 820 | EL | 40 x 80 | 4.39 | 9.86 | 215 | 150 | ALF80(1)821EL500 |
| 500 | 1,000 | EN | 40 x 100 | 4.95 | 10.85 | 177 | 120 | ALF80(1)102EN500 |
| 500 | 1,200 | FP | 45 x 105 | 5.64 | 12.44 | 167 | 119 | ALF80(1)122FP500 |
| 500 | 1,300 | FP | 45 x 105 | 5.94 | 12.89 | 155 | 113 | ALF80(1)132FP500 |
| 500 | 1,500 | KP | 50 x 105 | 6.62 | 13.91 | 136 | 98 | ALF80(1)152KP500 |
| 500 | 1,600 | KP | 50 x 105 | 6.89 | 14.25 | 128 | 94 | ALF80(1)162KP500 |
| 500 | 1,800 | KP | 50 x 105 | 7.38 | 14.81 | 115 | 83 | ALF80(1)182KP500 |
| VDC | Rated Capacitance | Size Code | Case Size | Ripple Current | | ESR | Impedance | Part Number |

(1) Termination code: See Termination Tables for available options

Environmental Compliance



All Part Numbers in this datasheet are Reach and RoHS compliant.

As an environmentally conscious company, KEMET is working continuously with improvements concerning the environmental effects of both our capacitors and their production.

In Europe (RoHS Directive) and in some other geographical areas such as China, legislation has been put in place to prevent the use of some hazardous materials, such as lead (Pb), in electronic equipment. All products in this catalog are produced to help our customers' obligations to guarantee their products and fulfill these legislative requirements. The only material of concern in our products has been lead (Pb), which has been removed from all designs to fulfill the requirement of containing less than 0.1% of lead in any homogeneous material. KEMET will closely follow any changes in legislation worldwide and make any necessary changes in its products, whenever needed.

Some customer segments such as medical, military and automotive electronics may still require the use of lead in electrode coatings. To clarify the situation and distinguish products from each other, a special symbol is used on the packaging labels for RoHS compatible capacitors.

Due to customer requirements, there may appear additional markings such as lead-free (LF), or lead-free wires (LFW) on the label.

Mechanical Data

Polarity and Reversed Voltage

Aluminium Electrolytic capacitors manufactured for use in DC applications contain an anode foil and a cathode foil. As such, they are polarized devices and must be connected with the +ve to the anode foil and the -ve to the cathode foil. If this were to be reversed then the electrolytic process that took place in forming the oxide layer on the anode would be recreated in trying to form an oxide layer on the cathode. In forming the cathode foil in this way, heat would be generated and gas given off within the capacitor, usually leading to catastrophic failure.

The cathode foil already possesses a thin stabilized oxide layer. This thin oxide layer is equivalent to a forming voltage of approximately 2 V. As a result, the capacitor can withstand a voltage reversal of up to 2 V for short periods. Above this voltage, the formation process will commence. Aluminium Electrolytic capacitors can also be manufactured for use in intermittent AC applications by using two anode foils in place of one anode and one cathode.

Mounting Position

The capacitor can be mounted upright or inclined to a horizontal position. Special attention for the safety vent coverage, which this ensures that internal gas generated can escape when the pressure reaches a certain value due to overstress or catastrophic failure. All mounting positions must allow the safety vent to work properly.

Insulating Resistance

≥ 100 MΩ at 100 VDC across insulating sleeve.

Voltage Proof

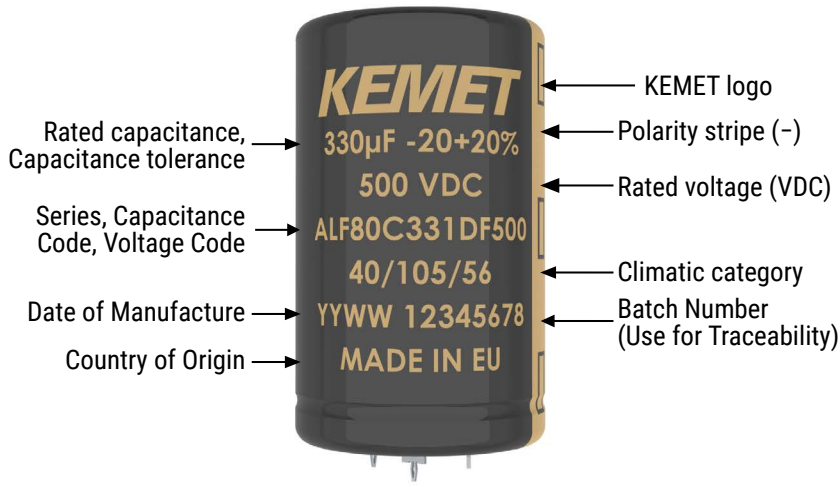
≥ 3,500 VDC across insulating sleeve.

≥ 2,500 VAC across insulating sleeve.

Safety Vent

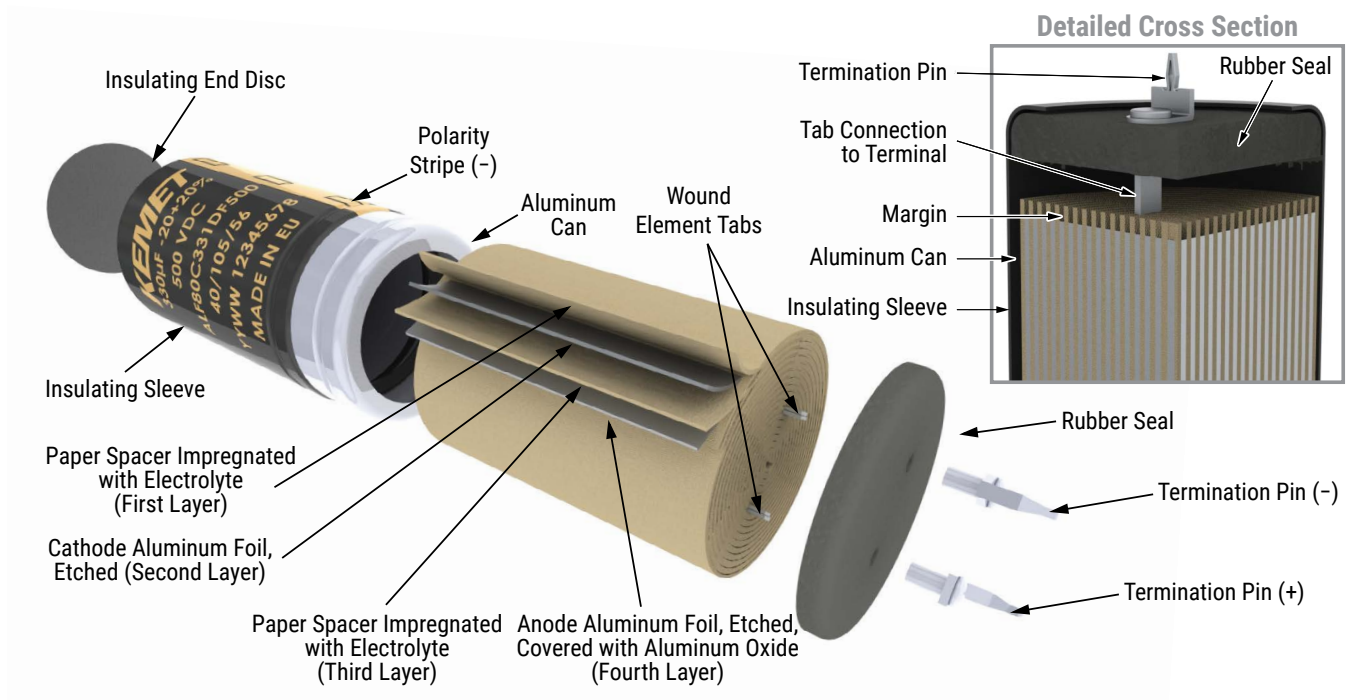
For diameters up to 40 mm, the safety vent for overpressure is featured on the base (opposing end to the terminals), and for diameters 45 mm or higher, the safety vent is featured in the side of the can. This is a weakened area in the bottom of the can that is designed to relieve build-up of internal pressure due to overstress or catastrophic failure.

Marking



*Print shown is representative of the data included on the sleeve. Actual appearance can be continuous print style.

Construction



Construction Data

The manufacturing process begins with the anode foil being electrochemically etched to increase the surface area and then “formed” to produce the aluminum oxide layer. Both the anode and cathode foils are then interleaved with absorbent paper and wound into a cylinder. During the winding process, aluminum tabs are attached to each foil to provide the electrical contact.

The deck, complete with terminals, is attached to the tabs and then folded down to rest on top of the winding. The complete winding is impregnated with electrolyte before being housed in a suitable container, usually an aluminum can, and sealed. Throughout the process, all materials inside the housing must be maintained at the highest purity and be compatible with the electrolyte.

Each capacitor is aged and tested before being sleeved and packed. The purpose of aging is to repair any damage in the oxide layer and thus reduce the leakage current to a very low level. Aging is normally carried out at the rated temperature of the capacitor and is accomplished by applying voltage to the device while carefully controlling the supply current. The process may take several hours to complete.

Damage to the oxide layer can occur due to variety of reasons:

- Slitting of the anode foil after forming
- Attaching the tabs to the anode foil
- Minor mechanical damage caused during winding

A sample from each batch is taken by the quality department after completion of the production process. This sample size is controlled by the use of recognized sampling tables defined in BS 6001.

The following tests are applied and may be varied at the request of the customer. In this case the batch, or special procedure, will determine the course of action.

Electrical:

- Leakage current
- Capacitance
- ESR
- Impedance
- Tan Delta

Mechanical/Visual:

- Overall dimensions
- Torque test of mounting stud
- Print detail
- Box labels
- Packaging, including packed quantity



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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

KEMET requires its products to be packaged and shipped on pallets. This is because KEMET's products are specifically designed to be packed onto pallets during shipment. If for any reason, the products are removed from pallets by the shipping party and shipped to the end customer, then additional external protection is required. In this instance, an external box with two carton layers and an upwards orientation sticker must be used by the shipping party, with the empty space filled with filling material, and afterwards sealing the box. If this packing and packaging guideline is not followed by the shipping party, the shipping party, and not KEMET, will be held responsible for any packaging, packing and/or product damages upon delivery of the products to the end customer. KEMET hereby disclaims any liability for damages to the products or otherwise that have been, or threaten to be, inflicted, result from or are in any way related to the packaging, packing or damage by the shipping party in contravention of the packing and packaging guidelines herein.

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