

## Overview

KEMET's PEG124 is an electrolytic capacitor with very long-life and outstanding electrical performance. The device has a polarized all-welded design, tinned copper wire leads, a negative pole connected to the case, and plastic insulation. Long-life and very high reliability are achieved by dimensioning of the capacitor, careful selection of materials/methods and discipline in quality control allowing operation up to +125°C/+105°C.

The PEG124 winding is housed in a cylindrical aluminum can with a high purity aluminum lid and high quality rubber gasket. The sealing system is designed for electrolyte leakage-free operation and a very low gas-diffusion rate of electrolyte. Low ESR is the result of a low resistive electrolyte/paper system and an all-welded design.

## Applications

KEMET's PEG124 is a high performance axial electrolytic capacitor. Typical applications include smoothing, coupling/decoupling and energy storage in telecommunication, power supply system, data processing, process control and measuring where long life and high reliability are of paramount importance.

## Benefits

- Operating temperature of +125°C and +105°C
- Very long life, up to 27,500 hours at +105°C
- Low ESR
- Low ESL
- Polarized all-welded design
- Outstanding electrical performance



## Part Number System

| PEG124                      | E  |   | F                   | 410   | 0                                      | Q  | T1                         |
|-----------------------------|--|---|---------------------|---|--|--|----------------------------|
| Series                      | Voltage (VDC)                                  |   | Size Code           | Capacitance Code (µF)   | Version                                | Capacitance Tolerance                    | Packaging                  |
| Axial Aluminum Electrolytic | E = 10<br>G = 16<br>H = 25<br>K = 40<br>M = 63 | P = 100<br>R = 200<br>U = 350<br>V = 400<br>Y = 450 | See Dimension Table | The second two digits indicate the two most significant digits of the capacitance value. The first digit indicates the total number digits. | 0 = Standard<br>A-Z = High Performance | Q = -10 +30%<br>M = ±20%<br>T = -10 +50% | See Ordering Options Table |

## Performance Characteristics

| Item                          | Performance Characteristics  |   |
|-------------------------------|--|---|
| Capacitance Range             | 1 – 4,700 $\mu\text{F}$  | 1 – 470 $\mu\text{F}$   |
| Rated Voltage                 | 10 – 63 VDC  | 100 – 450 VDC   |
| Operating Temperature         | -40 to +125°C  | -40 to +105°C   |
| Capacitance Tolerance         | -10/+30%, (-10/+50%, $\pm 20\%$ select values) at 100 Hz/+20°C   |   |
| Operational Lifetime          | 27,500 hours at +105°C (hours, D = 20 mm)  |   |
| Shelf Life                    | 5,000 hours at +105°C or 10 years at +40°C 0 VDC +40°C 10 years 0 VDC  |   |
| Leakage Current               | I = 0.01 CV ( $\mu\text{A}$ , CV $\leq$ 1,000)<br>I = 0.003 CV + 4.0 ( $\mu\text{A}$ , CV > 1,000)   | I = 0.006 CV + 4.0 ( $\mu\text{A}$ )  |
|                               | C = rated capacitance ( $\mu\text{F}$ ), V = rated voltage (VDC). Voltage applied for 5 minutes at +20°C.  |   |
| Vibration Test Specifications | Procedure  | Requirements  |
|                               | 0.75 mm displacement amplitude or 10 g maximum acceleration. Vibration applied for three 2-hour sessions at 10 – 500 Hz (capacitor clamped by body). | No leakage of electrolyte or other visible damage. Deviations in capacitance and $\tan \delta$ from initial measurements must not exceed:<br>$\Delta C/C < 5\%$ |
| Standards                     | IEC 60384–4 long life grade 40/125/56  | IEC 60384–4 long life grade 40/105/56   |

## Compensation Factor of Ripple Current (RC) vs. Frequency

|             |        |       |       |         |
|-------------|--------|-------|-------|---------|
| Frequency   | 300 Hz | 1 kHz | 5 kHz | 100 kHz |
| Coefficient | 0.57   | 0.80  | 1.00  | 1.04    |

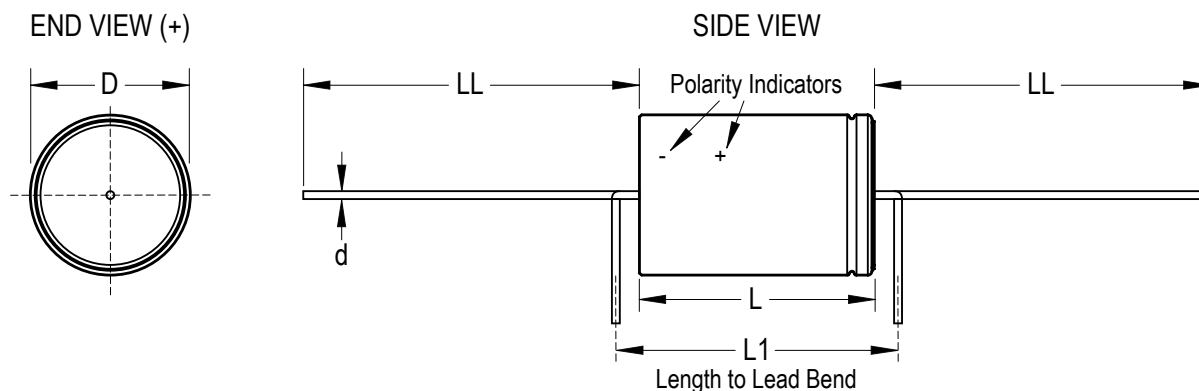
## Test Method & Performance

| Endurance Life Test          |  |                                 |
|------------------------------|--|---------------------------------|
| Conditions                   | Performance  |                                 |
| Temperature                  | +125°C   | +105°C ( $\geq 100$ V)          |
| Test Duration                | 2,000 hours  | 5,000 hours                     |
| Ripple Current               | Maximum 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 |
|                              | $\geq$ 160 V   | Within 10% of the initial value |
| Equivalent Series Resistance | Does not exceed 200% of the initial value  |                                 |
| Leakage Current              | Does not exceed leakage current limit  |                                 |

## Ordering Options Table

| Case Size                       | Packaging Kind | Lead Length (mm)    | Lead and Packaging Code |
|---------------------------------|----------------|---------------------|-------------------------|
| Standard Bulk Packaging Options |                |                     |                         |
|                                 | Bulk (box)     | 42 +3/-2            | L1                      |
| ≤ 13 x 37                       | Tape & Reel    | See Dimension Table | T1                      |

## Dimensions – Millimeters



| Size Code | Dimensions in mm |      |         |       | Bulk LL | Taped LL | Approximate Weight Grams |
|-----------|------------------|------|---------|-------|---------|----------|--------------------------|
|           | D                | L    | L1      | d     |         |          |                          |
|           | ±0.5             | ±1   | Minimum | ±0.03 | +3/-2   | +3/-2    |                          |
| A         | 10               | 20.0 | 26.0    | 0.8   |         | 31       | 3                        |
| B         | 10               | 29.0 | 35.0    | 0.8   |         | 27       | 4                        |
| C         | 13               | 20.0 | 26.0    | 0.8   |         | 31       | 4                        |
| D         | 13               | 29.0 | 35.0    | 0.8   |         | 27       | 6                        |
| E         | 13               | 37.0 | 43.0    | 0.8   | 42      | 24       | 7                        |
| F         | 16               | 29.0 | 35.0    | 0.8   | 42      |          | 8                        |
| G         | 16               | 37.0 | 43.0    | 0.8   | 42      |          | 11                       |
| H         | 20               | 29.0 | 35.0    | 0.8   | 42      |          | 13                       |
| J         | 20               | 37.0 | 43.0    | 0.8   | 42      |          | 20                       |
| L         | 20               | 46.0 | 52.0    | 0.8   | 42      |          | 24                       |

## 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 ten years at 40°C. See sectional specification under each product series for specific data.

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## Failure Rate

Estimated field failure rate:  $\leq 1.0$  ppm (failures per year/produced number of capacitors per year).

The expected failure rate for this capacitor range is based on field experience for capacitors with structural similarity.

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## Environmental Compliance

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 like 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 world wide and makes 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.

Because of customer requirements, there may appear additional markings such as LF = Lead Free or LFW = Lead Free Wires on the label.

**Table 1A – Ratings & Part Number Reference**

| 125°C |                   |           |                         |                     |                     |                      |                     |                      |                  |                  |
|-------|-------------------|-----------|-------------------------|---------------------|---------------------|----------------------|---------------------|----------------------|------------------|------------------|
| VDC   | Rated Capacitance | Size Code | Case Size<br>D x L (mm) | Ripple Current      |                     |                      | ESR                 |                      | L <sub>ESL</sub> | Part Number      |
|       |                   |           |                         | Maximum             | Rated               |                      | Maximum             |                      | Approximate      |                  |
|       |                   |           |                         | 100 Hz<br>125°C (A) | ≥ 5 kHz<br>60°C (A) | ≥ 5 kHz<br>125°C (A) | 100 Hz<br>20°C (mΩ) | 100 kHz<br>20°C (mΩ) | (nH)             |                  |
| 10    | 1000              | F         | 16 x 29                 | 1.035               | 4.6                 | 1.7                  | 200                 | 140                  | 10               | PEG124EF4100Q(1) |
| 10    | 1500              | G         | 16 x 37                 | 1.276               | 5.6                 | 2.1                  | 140                 | 100                  | 12               | PEG124EG4150Q(1) |
| 10    | 2200              | J         | 20 x 37                 | 1.804               | 8                   | 2.9                  | 90                  | 60                   | 15               | PEG124EJ4220Q(1) |
| 10    | 3300              | L         | 20 x 46                 | 2.088               | 8.8                 | 3.2                  | 70                  | 50                   | 17               | PEG124EL4330Q(1) |
| 16    | 68                | A         | 10 x 20                 | 0.13                | 0.95                | 0.36                 | 2400                | 1600                 | 5                | PEG124GA2680Q(1) |
| 16    | 100               | A         | 10 x 20                 | 0.191               | 1.2                 | 0.45                 | 1700                | 1100                 | 5                | PEG124GA3100Q(1) |
| 16    | 150               | B         | 10 x 29                 | 0.287               | 1.5                 | 0.61                 | 1100                | 710                  | 6                | PEG124GB3150Q(1) |
| 16    | 220               | B         | 10 x 29                 | 0.315               | 1.5                 | 0.7                  | 800                 | 540                  | 6                | PEG124GB3220Q(1) |
| 16    | 220               | C         | 13 x 20                 | 0.422               | 3.9                 | 1.4                  | 390                 | 140                  | 6                | PEG124GC322AQ(1) |
| 16    | 330               | D         | 13 x 29                 | 0.515               | 2.6                 | 1.1                  | 500                 | 330                  | 8                | PEG124GD3330Q(1) |
| 16    | 470               | C         | 13 x 20                 | 0.645               | 3.9                 | 1.5                  | 250                 | 120                  | 6                | PEG124GC347AQ(1) |
| 16    | 470               | D         | 13 x 29                 | 0.632               | 3.1                 | 1.1                  | 370                 | 250                  | 8                | PEG124GD3470Q(1) |
| 16    | 680               | E         | 13 x 37                 | 0.851               | 4.6                 | 1.7                  | 200                 | 120                  | 10               | PEG124GE3680Q(1) |
| 16    | 680               | F         | 16 x 29                 | 0.85                | 4                   | 1.5                  | 260                 | 180                  | 10               | PEG124GF3680Q(1) |
| 16    | 680               | F         | 16 x 29                 | 1.005               | 7.6                 | 2.7                  | 130                 | 50                   | 10               | PEG124GF368AQ(1) |
| 16    | 1000              | F         | 16 x 29                 | 1.166               | 7.6                 | 2.8                  | 110                 | 50                   | 10               | PEG124GF410AQ(1) |
| 16    | 1000              | G         | 16 x 37                 | 1.031               | 4.8                 | 1.8                  | 190                 | 130                  | 12               | PEG124GG4100Q(1) |
| 16    | 1500              | G         | 16 x 37                 | 1.49                | 9.3                 | 3.4                  | 70                  | 40                   | 12               | PEG124GG415AQ(1) |
| 16    | 1500              | J         | 20 x 37                 | 1.372               | 6                   | 2.2                  | 140                 | 100                  | 15               | PEG124GJ4150Q(1) |
| 16    | 2200              | G         | 16 x 37                 | 1.72                | 9.3                 | 3.4                  | 60                  | 40                   | 12               | PEG124GG422AQ(1) |
| 16    | 2200              | L         | 20 x 46                 | 1.782               | 8                   | 2.9                  | 90                  | 60                   | 17               | PEG124GL4220Q(1) |
| 16    | 3300              | J         | 20 x 37                 | 2.251               | 11.8                | 4.1                  | 40                  | 20                   | 15               | PEG124GJ433AQ(1) |
| 16    | 4700              | J         | 20 x 37                 | 2.685               | 12.7                | 5                    | 40                  | 20                   | 15               | PEG124GJ447AQ(1) |
| 25    | 47                | A         | 10 x 20                 | 0.141               | 1.1                 | 0.44                 | 2400                | 1300                 | 5                | PEG124HA2470Q(1) |
| 25    | 100               | B         | 10 x 29                 | 0.255               | 1.5                 | 0.56                 | 1200                | 670                  | 6                | PEG124HB3100Q(1) |
| 25    | 220               | C         | 13 x 20                 | 0.452               | 3.1                 | 1.2                  | 460                 | 200                  | 6                | PEG124HC322AQ(1) |
| 25    | 220               | D         | 13 x 29                 | 0.448               | 2.6                 | 0.96                 | 590                 | 320                  | 8                | PEG124HD3220Q(1) |
| 25    | 330               | C         | 13 x 20                 | 0.525               | 3.1                 | 1.2                  | 370                 | 200                  | 6                | PEG124HC333AQ(1) |
| 25    | 330               | E         | 13 x 37                 | 0.57                | 3.4                 | 1.2                  | 360                 | 200                  | 10               | PEG124HE3330Q(1) |
| 25    | 470               | F         | 16 x 29                 | 0.806               | 4.7                 | 1.7                  | 250                 | 140                  | 10               | PEG124HF3470Q(1) |
| 25    | 470               | F         | 16 x 29                 | 0.827               | 6.1                 | 2.1                  | 200                 | 80                   | 10               | PEG124HF347AQ(1) |
| 25    | 680               | F         | 16 x 29                 | 0.946               | 6                   | 2.1                  | 170                 | 80                   | 10               | PEG124HF368AQ(1) |
| 25    | 680               | G         | 16 x 37                 | 0.96                | 5.3                 | 1.9                  | 190                 | 110                  | 12               | PEG124HG3680Q(1) |
| 25    | 1000              | G         | 16 x 37                 | 1.248               | 7.8                 | 2.8                  | 110                 | 50                   | 12               | PEG124HG410AQ(1) |
| 25    | 1000              | J         | 20 x 37                 | 1.323               | 7.4                 | 2.6                  | 120                 | 70                   | 15               | PEG124HJ4100Q(1) |
| 25    | 1500              | G         | 16 x 37                 | 1.437               | 7.8                 | 2.8                  | 90                  | 60                   | 12               | PEG124HG415AQ(1) |
| 25    | 1500              | L         | 20 x 46                 | 1.659               | 8.9                 | 3.2                  | 90                  | 50                   | 17               | PEG124HL4150Q(1) |
| 25    | 2200              | J         | 20 x 37                 | 1.803               | 9.5                 | 3.2                  | 60                  | 40                   | 15               | PEG124HJ422BQ(1) |
| 25    | 3300              | J         | 20 x 37                 | 2.067               | 9.5                 | 3.3                  | 60                  | 40                   | 15               | PEG124HJ433BQ(1) |
| 25    | 4000              | L         | 20 x 46                 | 2.454               | 12.3                | 4.2                  | 40                  | 20                   | 17               | PEG124HL440BM(1) |
| 40    | 33                | A         | 10 x 20                 | 0.153               | 1.1                 | 0.39                 | 2900                | 1300                 | 5                | PEG124KA2330Q(1) |
| 40    | 68                | B         | 10 x 29                 | 0.221               | 1.5                 | 0.56                 | 1400                | 650                  | 6                | PEG124KB2680Q(1) |
| 40    | 150               | C         | 13 x 20                 | 0.381               | 3.1                 | 1.2                  | 580                 | 200                  | 6                | PEG124KC315AQ(1) |
| 40    | 150               | D         | 13 x 29                 | 0.416               | 2.8                 | 1                    | 620                 | 290                  | 8                | PEG124KD3150Q(1) |
| 40    | 220               | C         | 13 x 20                 | 0.452               | 3.1                 | 1.2                  | 440                 | 200                  | 6                | PEG124KC322AQ(1) |
| 40    | 220               | E         | 13 x 37                 | 0.487               | 3.5                 | 1.3                  | 440                 | 190                  | 10               | PEG124KE3220Q(1) |
| 40    | 220               | F         | 16 x 29                 | 0.575               | 3.9                 | 2                    | 410                 | 190                  | 10               | PEG124KF3220Q(1) |
| 40    | 330               | F         | 16 x 29                 | 0.739               | 6.1                 | 2.1                  | 240                 | 80                   | 10               | PEG124KF333AQ(1) |
| 40    | 330               | G         | 16 x 37                 | 0.692               | 4.8                 | 1.7                  | 290                 | 130                  | 12               | PEG124KG3330Q(1) |
| 40    | 470               | F         | 16 x 29                 | 0.827               | 6.1                 | 2.1                  | 200                 | 80                   | 10               | PEG124KF347CQ(1) |
| 40    | 470               | J         | 20 x 37                 | 0.898               | 6                   | 2.1                  | 220                 | 100                  | 15               | PEG124KJ3470Q(1) |
| 40    | 680               | G         | 16 x 37                 | 1.048               | 7.7                 | 2.7                  | 130                 | 50                   | 12               | PEG124KG368AQ(1) |
| 40    | 680               | J         | 20 x 37                 | 1.132               | 7.3                 | 2.6                  | 150                 | 70                   | 15               | PEG124KJ3680Q(1) |
| 40    | 1000              | G         | 16 x 37                 | 1.242               | 7.8                 | 2.8                  | 110                 | 50                   | 12               | PEG124KG410AQ(1) |
| 40    | 1000              | L         | 20 x 46                 | 1.414               | 8.8                 | 3.2                  | 100                 | 50                   | 17               | PEG124KL4100Q(1) |
| 40    | 1500              | J         | 20 x 37                 | 1.598               | 9.5                 | 3.3                  | 70                  | 40                   | 15               | PEG124KJ415AQ(1) |
| 40    | 2200              | J         | 20 x 37                 | 1.9                 | 9.6                 | 3.5                  | 60                  | 40                   | 15               | PEG124KJ422AQ(1) |
| 63    | 10                | A         | 10 x 20                 | 0.076               | 0.9                 | 0.35                 | 5900                | 1600                 | 5                | PEG124MA2100Q(1) |
| VDC   | Rated Capacitance | Size Code | Case Size               | Ripple Current      |                     |                      | ESR                 |                      | L <sub>ESL</sub> | Part Number      |

(1) Insert packaging code. See Ordering Options Table for available options.

**Table 1A – Ratings & Part Number Reference cont'd**

| 125°C |                     |           |            |                     |                     |                      |                     |                      |                  |                  |
|-------|---------------------|-----------|------------|---------------------|---------------------|----------------------|---------------------|----------------------|------------------|------------------|
| VDC   | Rated Capacitance   | Size Code | Case Size  | Ripple Current      |                     |                      | ESR                 |                      | L <sub>ESL</sub> | Part Number      |
|       |                     |           |            | Maximum             | Rated               |                      | Maximum             |                      | Approximate      |                  |
|       | 100 Hz<br>20°C (µF) |           | D x L (mm) | 100 Hz<br>125°C (A) | ≥ 5 kHz<br>60°C (A) | ≥ 5 kHz<br>125°C (A) | 100 Hz<br>20°C (mΩ) | 100 kHz<br>20°C (mΩ) | (nH)             |                  |
| 63    | 15                  | A         | 10 x 20    | 0.113               | 1                   | 0.39                 | 4300                | 1400                 | 5                | PEG124MA2150Q(1) |
| 63    | 22                  | A         | 10 x 20    | 0.134               | 1.1                 | 0.43                 | 3400                | 1200                 | 5                | PEG124MA2220Q(1) |
| 63    | 33                  | B         | 10 x 29    | 0.158               | 1.4                 | 0.53                 | 2200                | 780                  | 6                | PEG124MB2330Q(1) |
| 63    | 47                  | B         | 10 x 29    | 0.19                | 1.6                 | 0.57                 | 1600                | 550                  | 6                | PEG124MB2470Q(1) |
| 63    | 68                  | D         | 13 x 29    | 0.274               | 2.3                 | 0.89                 | 1100                | 400                  | 8                | PEG124MD2680Q(1) |
| 63    | 100                 | D         | 13 x 29    | 0.355               | 3                   | 1                    | 740                 | 260                  | 8                | PEG124MD3100Q(1) |
| 63    | 100                 | C         | 13 x 20    | 0.328               | 3.1                 | 1                    | 730                 | 220                  | 6                | PEG124MC310AQ(1) |
| 63    | 150                 | F         | 16 x 29    | 0.491               | 4                   | 1.4                  | 500                 | 180                  | 10               | PEG124MF3150Q(1) |
| 63    | 150                 | D         | 13 x 29    | 0.455               | 3.6                 | 1.4                  | 460                 | 150                  | 8                | PEG124MD315AQ(1) |
| 63    | 220                 | F         | 16 x 29    | 0.647               | 6.1                 | 2.1                  | 290                 | 80                   | 10               | PEG124MF322AQ(1) |
| 63    | 220                 | G         | 16 x 37    | 0.61                | 5                   | 1.8                  | 340                 | 120                  | 12               | PEG124MG3220Q(1) |
| 63    | 330                 | F         | 16 x 29    | 0.737               | 6.1                 | 2.1                  | 240                 | 80                   | 10               | PEG124MF333AQ(1) |
| 63    | 330                 | J         | 20 x 37    | 0.845               | 6.8                 | 2.3                  | 220                 | 80                   | 15               | PEG124MJ3330Q(1) |
| 63    | 470                 | G         | 16 x 37    | 0.927               | 7.5                 | 2.6                  | 170                 | 60                   | 12               | PEG124MG347AQ(1) |
| 63    | 470                 | L         | 20 x 46    | 1.018               | 7.9                 | 2.9                  | 160                 | 60                   | 17               | PEG124ML3470Q(1) |
| 63    | 680                 | G         | 16 x 37    | 1.09                | 7.5                 | 2.6                  | 140                 | 60                   | 12               | PEG124MG368AQ(1) |
| 63    | 1000                | J         | 20 x 37    | 1.399               | 9.2                 | 3.1                  | 90                  | 40                   | 15               | PEG124MJ410AQ(1) |
| 63    | 1500                | L         | 20 x 46    | 1.715               | 10.2                | 3.5                  | 70                  | 40                   | 17               | PEG124ML415AQ(1) |
| VDC   | Rated Capacitance   | Size Code | Case Size  | Ripple Current      |                     |                      | ESR                 |                      | L <sub>ESL</sub> | Part Number      |

(1) Insert packaging code. See Ordering Options Table for available options.

**Table 1B – Ratings & Part Number Reference**

| 105°C |                     |           |            |                     |                     |                      |                     |                      |             |                  |
|-------|---------------------|-----------|------------|---------------------|---------------------|----------------------|---------------------|----------------------|-------------|------------------|
| VDC   | Rated Capacitance   | Size Code | Case Size  | Ripple Current      |                     |                      | ESR                 |                      | $L_{ESL}$   | Part Number      |
|       |                     |           |            | Maximum             | Rated               |                      | Maximum             |                      | Approximate |                  |
|       | 120 Hz<br>20°C (µF) |           | D x L (mm) | 100 Hz<br>105°C (A) | ≥ 5 kHz<br>60°C (A) | ≥ 5 kHz<br>105°C (A) | 100 Hz<br>20°C (mΩ) | 100 kHz<br>20°C (mΩ) | (nH)        |                  |
| 100   | 4.7                 | A         | 10 x 20    | 0.05                | 0.65                | 0.20                 | 16000               | 2800                 | 5           | PEG124PA147CQ(1) |
| 100   | 22                  | B         | 10 x 29    | 0.122               | 1.24                | 0.37                 | 3000                | 1100                 | 6           | PEG124PB222VQ(1) |
| 100   | 47                  | D         | 13 x 29    | 0.206               | 1.90                | 0.58                 | 1500                | 540                  | 8           | PEG124PD247VQ(1) |
| 100   | 47                  | E         | 13 x 37    | 0.192               | 1.50                | 0.45                 | 1800                | 920                  | 10          | PEG124PE247CQ(1) |
| 100   | 100                 | F         | 16 x 29    | 0.354               | 3.20                | 0.98                 | 700                 | 260                  | 10          | PEG124PF310VQ(1) |
| 100   | 220                 | G         | 16 x 37    | 0.536               | 3.60                | 1.10                 | 500                 | 300                  | 12          | PEG124PG322CQ(1) |
| 100   | 470                 | L         | 20 x 46    | 0.904               | 6.30                | 1.90                 | 210                 | 120                  | 17          | PEG124PL347VQ(1) |
| 200   | 10                  | B         | 10 x 29    | 0.065               | 0.47                | 0.17                 | 10000               | 4200                 | 6           | PEG124RB2100Q(1) |
| 200   | 15                  | D         | 13 x 29    | 0.096               | 0.74                | 0.26                 | 6300                | 2400                 | 8           | PEG124RD2150Q(1) |
| 200   | 22                  | D         | 13 x 29    | 0.12                | 0.86                | 0.31                 | 4600                | 1900                 | 8           | PEG124RD2220Q(1) |
| 200   | 33                  | F         | 16 x 29    | 0.167               | 1.20                | 0.42                 | 3100                | 1300                 | 10          | PEG124RF2330Q(1) |
| 200   | 47                  | F         | 16 x 29    | 0.21                | 1.50                | 0.53                 | 2200                | 920                  | 10          | PEG124RF2470Q(1) |
| 200   | 68                  | H         | 20 x 29    | 0.294               | 2.00                | 0.71                 | 1500                | 660                  | 12          | PEG124RH2680Q(1) |
| 200   | 100                 | J         | 20 x 37    | 0.353               | 2.40                | 0.88                 | 1000                | 440                  | 15          | PEG124RJ3100Q(1) |
| 200   | 150                 | L         | 20 x 46    | 0.446               | 3.10                | 1.10                 | 690                 | 300                  | 17          | PEG124RL3150Q(1) |
| 350   | 4.7                 | B         | 10 x 29    | 0.055               | 0.37                | 0.14                 | 17000               | 7500                 | 6           | PEG124UB1470Q(1) |
| 350   | 6.8                 | D         | 13 x 29    | 0.092               | 0.59                | 0.22                 | 9000                | 4200                 | 8           | PEG124UD1680Q(1) |
| 350   | 10                  | D         | 13 x 29    | 0.102               | 0.65                | 0.24                 | 7600                | 3600                 | 8           | PEG124UD2100Q(1) |
| 350   | 22                  | F         | 16 x 29    | 0.184               | 1.20                | 0.44                 | 3300                | 1500                 | 10          | PEG124UF2220Q(1) |
| 350   | 33                  | H         | 20 x 29    | 0.248               | 1.60                | 0.56                 | 2300                | 1100                 | 12          | PEG124UH2330Q(1) |
| 350   | 47                  | J         | 20 x 37    | 0.328               | 2.10                | 0.77                 | 1500                | 660                  | 15          | PEG124UJ2470Q(1) |
| 350   | 68                  | L         | 20 x 46    | 0.389               | 2.50                | 0.91                 | 1100                | 500                  | 17          | PEG124UL2680Q(1) |
| 400   | 2.2                 | B         | 10 x 29    | 0.042               | 0.27                | 0.11                 | 25000               | 12000                | 6           | PEG124VB1220Q(1) |
| 400   | 4.7                 | D         | 13 x 29    | 0.078               | 0.52                | 0.21                 | 11000               | 5100                 | 8           | PEG124VD1470Q(1) |
| 400   | 10                  | E         | 13 x 37    | 0.116               | 0.70                | 0.26                 | 5900                | 3000                 | 10          | PEG124VE2100Q(1) |
| 400   | 22                  | G         | 16 x 37    | 0.209               | 1.40                | 0.50                 | 2700                | 1200                 | 12          | PEG124VG2220Q(1) |
| 400   | 33                  | J         | 20 x 37    | 0.304               | 1.90                | 0.71                 | 1600                | 760                  | 15          | PEG124VJ2330Q(1) |
| 400   | 47                  | L         | 20 x 46    | 0.377               | 2.40                | 0.89                 | 1200                | 530                  | 17          | PEG124VL2470Q(1) |
| 450   | 1.0                 | A         | 10 x 20    | 0.03                | 0.21                | 0.08                 | 49000               | 20000                | 5           | PEG124YA1100Q(1) |
| 450   | 2.2                 | B         | 10 x 29    | 0.043               | 0.29                | 0.11                 | 24000               | 11000                | 6           | PEG124YB1220Q(1) |
| 450   | 3.3                 | B         | 10 x 29    | 0.055               | 0.38                | 0.14                 | 17000               | 7300                 | 6           | PEG124YB1330Q(1) |
| 450   | 4.7                 | D         | 13 x 29    | 0.079               | 0.54                | 0.20                 | 11000               | 4800                 | 8           | PEG124YD1470Q(1) |
| 450   | 6.8                 | D         | 13 x 29    | 0.097               | 0.61                | 0.22                 | 8300                | 4000                 | 8           | PEG124YD1680Q(1) |
| 450   | 10                  | F         | 16 x 29    | 0.133               | 0.82                | 0.40                 | 5700                | 2800                 | 10          | PEG124YF2100Q(1) |
| 450   | 10                  | F         | 16 x 29    | 0.141               | 1.40                | 0.30                 | 4600                | 1700                 | 10          | PEG124YF210AT(1) |
| 450   | 15                  | G         | 16 x 37    | 0.171               | 1.10                | 0.41                 | 3600                | 1700                 | 12          | PEG124YG2150Q(1) |
| 450   | 15                  | H         | 20 x 29    | 0.185               | 1.60                | 0.49                 | 3300                | 1400                 | 12          | PEG124YH215AQ(1) |
| 450   | 22                  | H         | 20 x 29    | 0.24                | 1.60                | 0.56                 | 2400                | 1100                 | 12          | PEG124YH2220Q(1) |
| 450   | 22                  | J         | 20 x 37    | 0.242               | 2.30                | 0.67                 | 2100                | 800                  | 15          | PEG124YJ222AT(1) |
| 450   | 33                  | J         | 20 x 37    | 0.306               | 2.00                | 0.72                 | 1600                | 740                  | 15          | PEG124YJ2330Q(1) |
| 450   | 47                  | L         | 20 x 46    | 0.377               | 2.40                | 0.89                 | 1200                | 530                  | 17          | PEG124YL2470Q(1) |
| VDC   | Rated Capacitance   | Size Code | Case Size  | Ripple Current      |                     |                      | ESR                 |                      | $L_{ESL}$   | Part Number      |

(1) Insert packaging code. See Ordering Options Table for available options.

## Operational Life PEG124 (+125°C)

Operational life ( $L_{op}$ ) at ambient temperature  $T_a$  and ripple current  $I_{AC}$ .

**Diagram valid for 20 mm case size.**

Operational life,

16 mm case size: 0.67 x diagram value

13 mm case size: 0.44 x diagram value

10 mm case size: 0.37 x diagram value

Example:

Article: PEG124MG368AQ (16 x 37 mm)

Ambient temperature ( $T_a$ ): +85°C

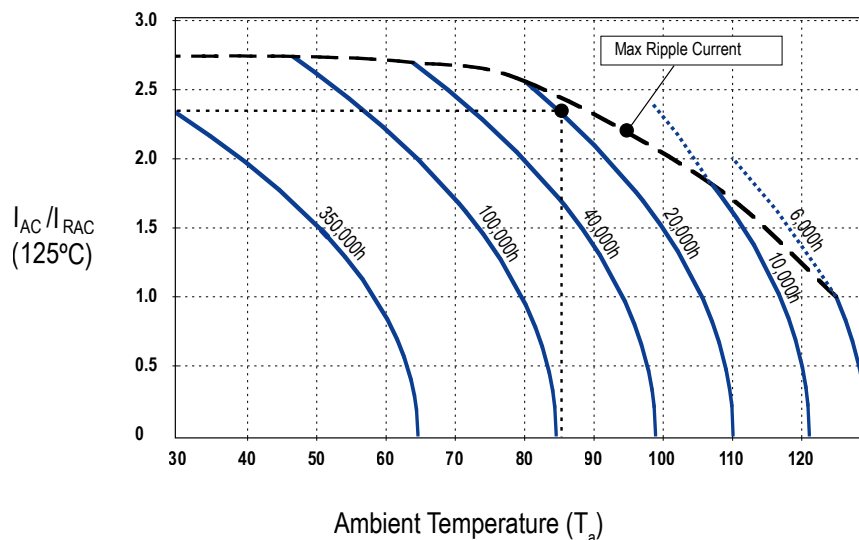
Ripple current at 10 kHz ( $I_{AC}$ ): 6.0 A

$I_{RAC}$  (+125°C,  $\geq 5$  kHz) = 2.6 A (from data table)

$\rightarrow I_{AC} / I_{RAC}$  (+125°C) = 2.3

Operational life: Interpolation between the

$L_{op}$ -curves  $\rightarrow L_{op} \sim 20$  kh x 0.67 = 13 kh (blue curves)



## Operational Life PEG124 (+105°C)

Operational life ( $L_{op}$ ) at ambient temperature  $T_a$  and ripple current  $I_{AC}$ .

**Diagram valid for 20 mm case size.**

Operational life,

16 mm case size: 0.67 x diagram value

13 mm case size: 0.44 x diagram value

10 mm case size: 0.37 x diagram value

Example:

Article: PEG124RL3150Q (20 x 46 mm)

Ambient temperature ( $T_a$ ): +79°C

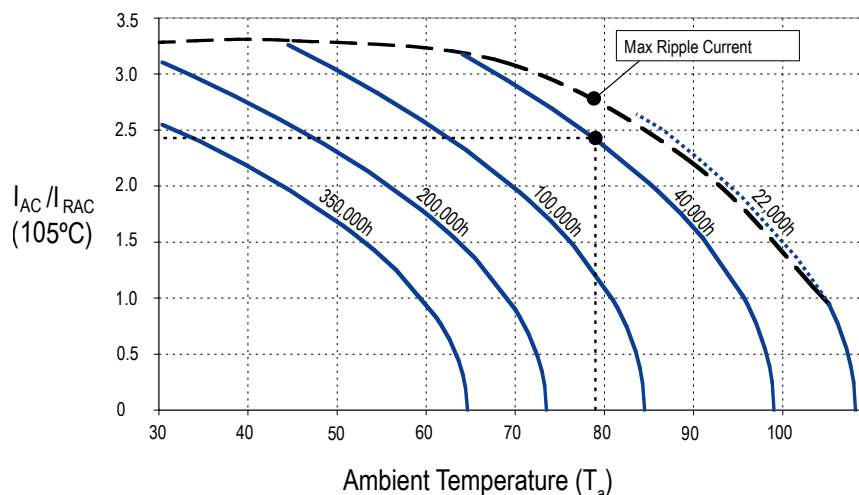
Ripple current, at 10 kHz ( $I_{AC}$ ): 2.7 A

$I_{RAC}$  (105°C,  $\geq 5$  kHz) = 1.10 A (from data table)

$\rightarrow I_{AC} / I_{RAC}$  (+105°C) = 2.45

Operational life: Interpolation between the

$L_{op}$ -curves  $\rightarrow L_{op} \sim 40$  kh (blue curves)

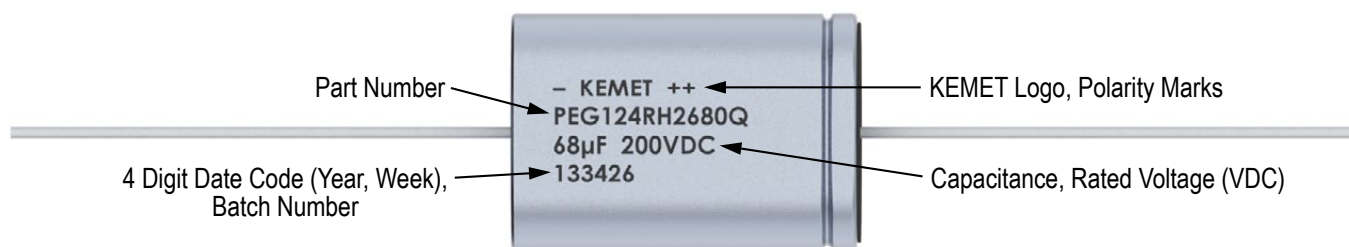




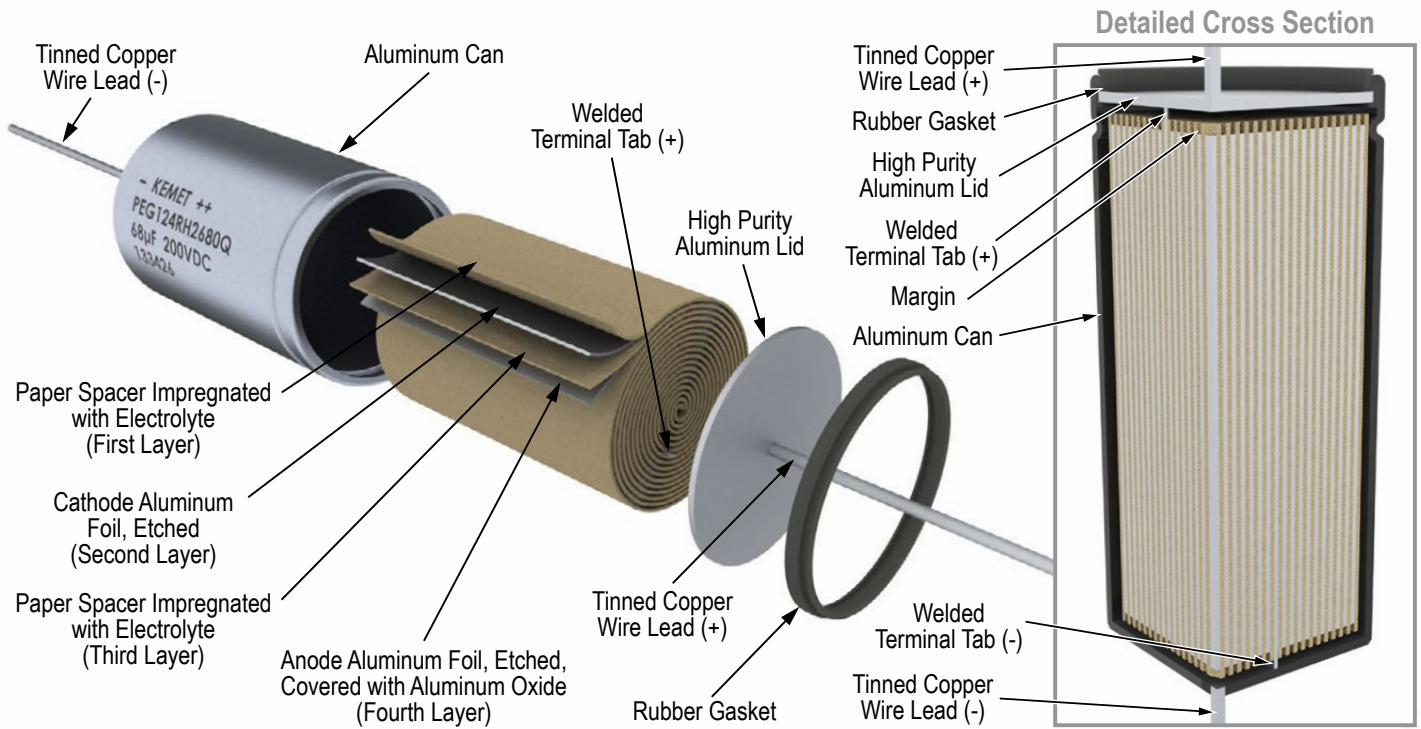
## Packaging Quantities

| Size Code | Packaging Quantities |      |
|-----------|----------------------|------|
|           | Tape & Reel          | Bulk |
| A         | 500                  | 250  |
| B         | 500                  | 200  |
| C         | 400                  | 250  |
| D         | 400                  | 200  |
| E         | 400                  | 150  |
| F         |                      | 125  |
| G         |                      | 100  |
| H         |                      | 150  |
| J         |                      | 125  |
| L         |                      | 100  |

## Marking

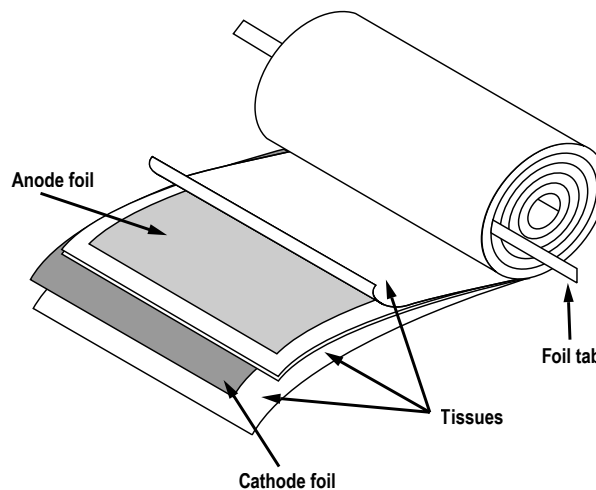


## Construction



## Construction cont'd

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 winding is assembled to the capacitor Al-can and to the Al-lid. The can is filled with electrolyte and the winding is impregnated during a vacuum treatment. The capacitor is 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 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 carried out at elevated temperature and is accomplished by applying voltage to the device while carefully controlling the supply current. The process takes between 2 and 20 hours, depending on voltage rating.

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

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

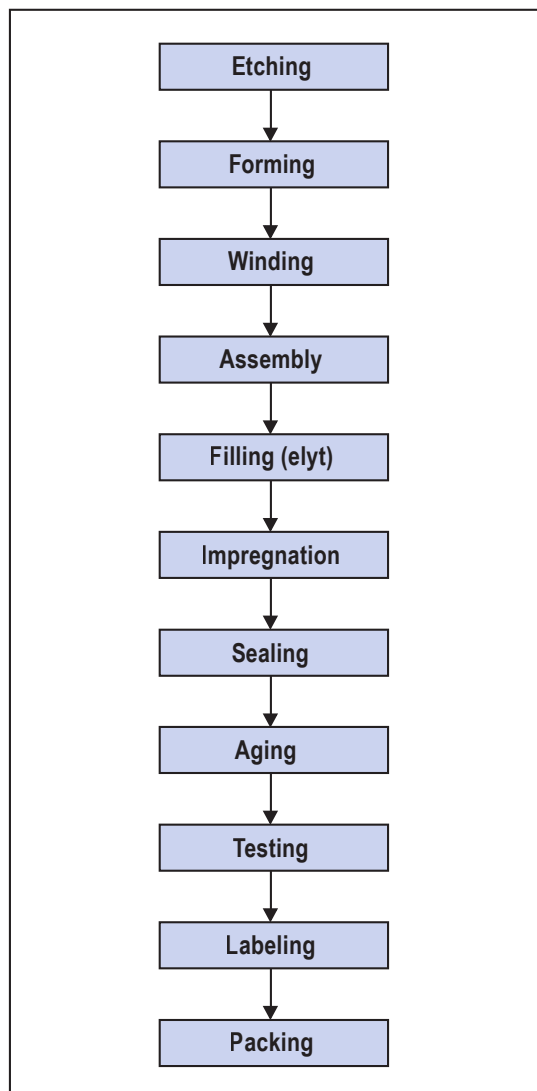
The following tests are applied for each individual capacitor.

Electrical:

- Leakage current
- Capacitance
- ESR
- Tan Delta

Mechanical/Visual:

- Pull strength test of wire terminals
- Print detail
- Box labels
- Packaging, including packed quantity



## KEMET Corporation World Headquarters

2835 KEMET Way  
Simpsonville, SC 29681

Mailing Address:  
P.O. Box 5928  
Greenville, SC 29606

www.kemet.com  
Tel: 864-963-6300  
Fax: 864-963-6521

**Corporate Offices**  
Fort Lauderdale, FL  
Tel: 954-766-2800

## North America

**Northeast**  
Wilmington, MA  
Tel: 978-658-1663

**Southeast**  
Lake Mary, FL  
Tel: 407-855-8886

**Central**  
Novi, MI  
Tel: 248-994-1030

Irving, TX  
Tel: 972-915-6041

**West**  
Milpitas, CA  
Tel: 408-433-9950

**Mexico**  
Guadalajara, Jalisco  
Tel: 52-33-3123-2141

## Europe

**Southern Europe**  
Sasso Marconi, Italy  
Tel: 39-051-939111

Skopje, Macedonia  
Tel: 389-2-55-14-623

**Central Europe**  
Landsberg, Germany  
Tel: 49-8191-3350800

Kamen, Germany  
Tel: 49-2307-438110

**Northern Europe**  
Wyboston, United Kingdom  
Tel: 44-1480-273082

Espoo, Finland  
Tel: 358-9-5406-5000

## Asia

**Northeast Asia**  
Hong Kong  
Tel: 852-2305-1168

Shenzhen, China  
Tel: 86-755-2518-1306

Beijing, China  
Tel: 86-10-5877-1075

Shanghai, China  
Tel: 86-21-6447-0707

Seoul, South Korea  
Tel: 82-2-6294-0550

Taipei, Taiwan  
Tel: 886-2-27528585

**Southeast Asia**  
Singapore  
Tel: 65-6701-8033

Penang, Malaysia  
Tel: 60-4-6430200

Bangalore, India  
Tel: 91-806-53-76817

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