

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. Thanks to its mechanical robustness, the PEG124 is also suitable for use in mobile and aircraft installations.

Benefits

- Operating temperature of +125°C and +105°C
- Long life, up to 27,500 hours at +105°C
- Low ESR
- Low ESL

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.



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 G = 16 H = 25 K = 40 M = 63	P = 100 R = 200 U = 350 V = 400 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 A-Z = High Performance	Q = -10 +30% M = ±20%	See Ordering Options Table

Performance Characteristics

Item	Performance Characteristics	
Capacitance Range	1 – 4,700 μ F	1 – 470 μ 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 (μ A, CV \leq 1,000) I = 0.003 CV + 4000 (μ A, CV > 1,000)	I = 0.006 CV + 4,000 (μ A)
	C = rated capacitance (μ 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 δ from initial measurements must not exceed: Δ C/C < 5%
Standards	IEC 60384–4 long life grade 40/125/56	

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

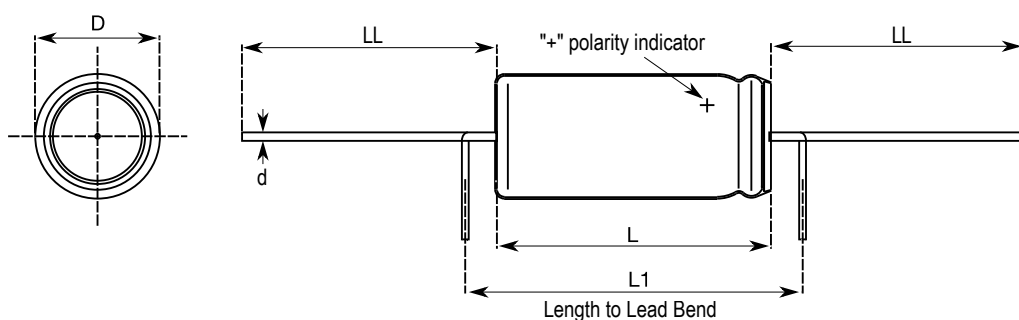
Test Method & Performance

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 (bag)	42 +3/-2	L1
≤ 13 x 37	Tape & Reel	See Dimension Table	T1

Dimensions – Millimeters



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

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; thus, 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.

Reliability as a function of time, $R(t)$, is normally expressed as: $R(t) = e^{-\lambda t}$
where $R(t)$ is the probability that the component will perform satisfactorily for time t , and λ is the failure rate.

Failure Rate

The failure rate is the number of components failing per unit time. The failure rate of most electronic components follows the characteristic pattern:

- Early failures are removed during the manufacturing process.
- The operational life is characterized by a constant failure rate.
- The wear out period is characterized by a rapidly increasing failure rate.

The failures in time (FIT) are given with a 60% confidence level for the various type codes. By convention, FIT is expressed as 1×10^{-9} failures per hour. Failure rate is also expressed as a percentage of failures per 1,000 hours.

e.g., 100FIT = 1×10^{-7} failures per hour = 0.01%/1,000 hours

End of Life Definition

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

Parametric Failure:

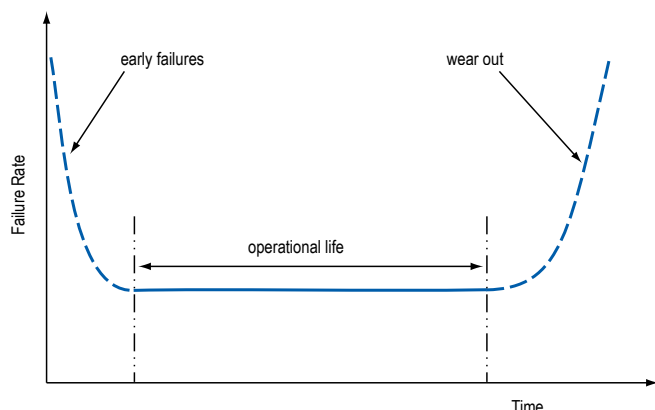
- Change in capacitance $> \pm 10\%$
- Leakage current $>$ specified limit
- ESR $> 2 \times$ initial ESR value

Failure Rate cont'd

MTBF

The mean time between failures (MTBF) is simply the inverse of the failure rate.

$$MTBF = 1/\lambda$$



Estimated field failure rate: ≤ 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.

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.



RoHS Compliant

Table 1A – Ratings & Part Number Reference

125°C										
VDC	Rated Capacitance	Size Code	Case Size D x L (mm)	Ripple Current			ESR		L _{ESL}	Part Number
				Maximum	Rated		Maximum		Approximate	
				100 Hz 125°C (A)	≥ 5 kHz 60°C (A)	≥ 5 kHz 125°C (A)	100 Hz 20°C (mΩ)	100 kHz 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 _{ESL}	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 _{ESL}	Part Number
				Maximum	Rated		Maximum		Approximate	
				100 Hz 125°C (A)	≥ 5 kHz 60°C (A)	≥ 5 kHz 125°C (A)	100 Hz 20°C (mΩ)	100 kHz 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 _{ESL}	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 20°C (µF)		D x L (mm)	100 Hz 125°C (A)	≥ 5 kHz 60°C (A)	≥ 5 kHz 125°C (A)	100 Hz 20°C (mΩ)	100 kHz 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	5.6	A	10 x 20	0.049	0.38	0.11	20000	10000	5	PEG124RA156BM(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

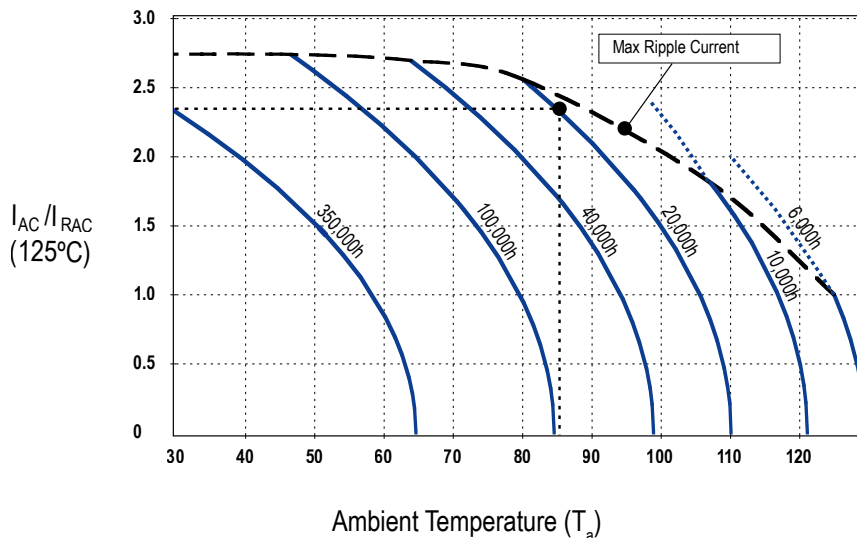
Ripple current at 10 kHz (I_{AC}): 6.2 A

I_{RAC} (+125°C, ≥ 5 kHz) = 2.7 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

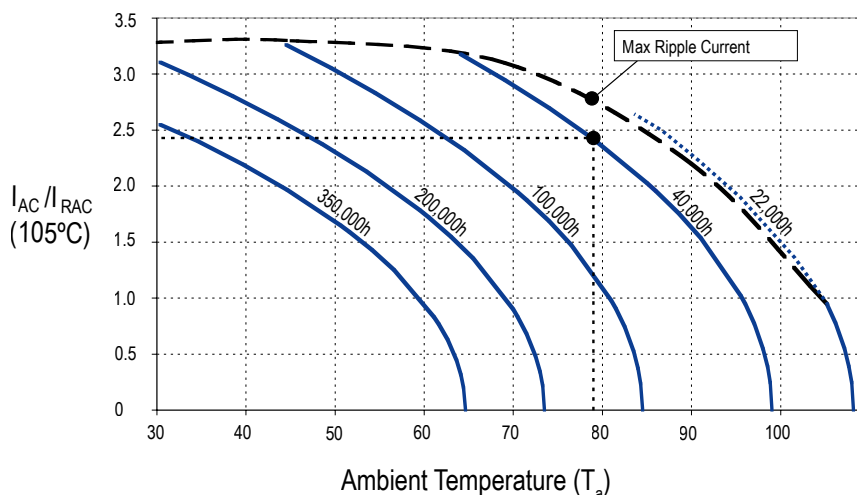
Ripple current, at 10 kHz (I_{AC}): 2.7 A

I_{RAC} (105°C, ≥ 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

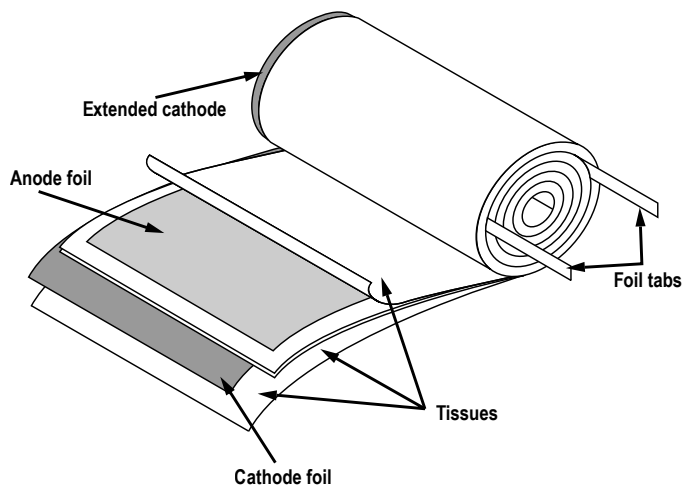
Print Detail

Standard Marking for PEG and PEH types

- KEMET Logo
- Rated capacitance
- Capacitance tolerance
- Rated voltage
- Date code
- Polarity indication
- Article code

Construction

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.

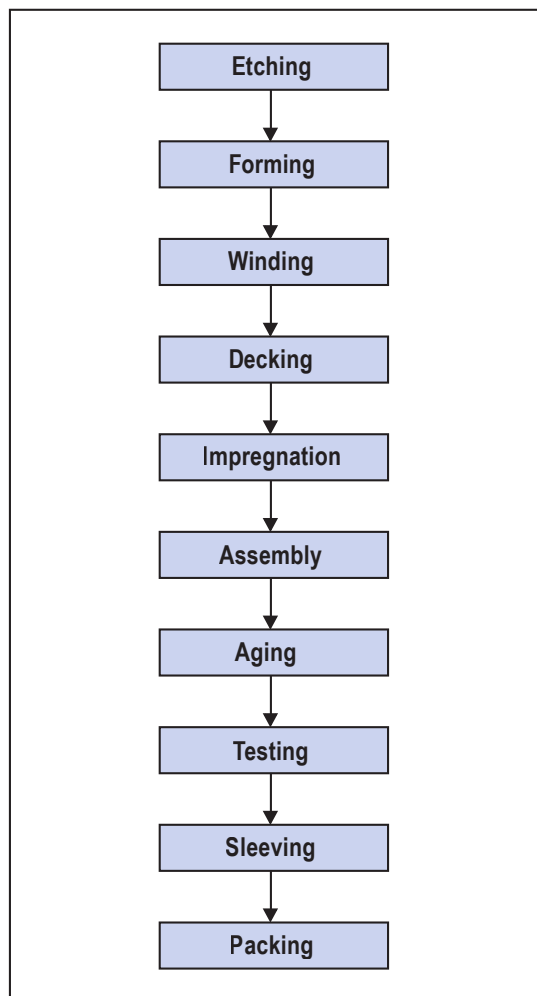
The following tests are applied and may be varied at the request of the customer. In this case the batch, or special procedure, will determine the course of action.

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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Tel: 39-051-939111

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Kamen, Germany
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Bishop's Stortford, United Kingdom
Tel: 44-1279-460122

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

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Beijing, China
Tel: 86-10-5829-1711

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

Taipei, Taiwan
Tel: 886-2-27528585

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Tel: 65-6586-1900

Penang, Malaysia
Tel: 60-4-6430200

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

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Other KEMET Resources

Tools	
Resource	Location
Configure A Part: CapEdge	http://capacitoredge.kemet.com
SPICE & FIT Software	http://www.kemet.com/spice
Search Our FAQs: KnowledgeEdge	http://www.kemet.com/keask
Electrolytic LifeCalculator	http://www.kemet.com:8080/elc

Product Information	
Resource	Location
Products	http://www.kemet.com/products
Technical Resources (Including Soldering Techniques)	http://www.kemet.com/technicalpapers
RoHS Statement	http://www.kemet.com/rohs
Quality Documents	http://www.kemet.com/qualitydocuments

Product Request	
Resource	Location
Sample Request	http://www.kemet.com/sample
Engineering Kit Request	http://www.kemet.com/kits

Contact	
Resource	Location
Website	www.kemet.com
Contact Us	http://www.kemet.com/contact
Investor Relations	http://www.kemet.com/ir
Call Us	1-877-MyKEMET
Twitter	http://twitter.com/kemetcapacitors

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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.

