PEG 124 125°C and 105°C

RoHS Compliant

- 125°C and 105°C
- Long life > 30 years at 50°C
- Low ESR
- Low ESL

APPLICATION

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.

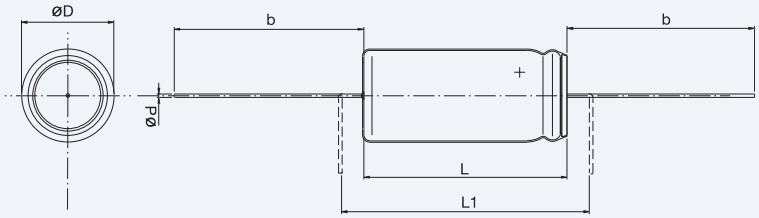
BASIC DESIGN

PEG 124 is an electrolytic capacitor with very Long Life and outstanding electrical performance. Polarized, all-welded design, tinned copper wire leads, negative pole connected to the case, plastic insulation. Long Life and very high reliability are achieved by the dimensioning of the capacitor, the careful selection of materials/ methods and discipline in quality control allowing operation up to +125°C/105°C.

The PEG 124 winding is housed in a cylindrical aluminium can with a high purity aluminium lid and a 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 a result of a low resistive electrolyte/paper system and an all-welded design. Thanks to its mechanical robustness the PEG 124 is also suitable for use in mobile and in aircraft installations.

SPECIFICATION

Standards	IEC 60384-4 Long Life Grade 40/125/56, DIN 41240, type 1A and 1B, DIN 40040 GKF, IEC 60384-4 Long Life Grade 40/105/56, DIN 41240, type 1A and 1B, DIN 40040 GMF,
CECC	CECC 30301-053 (10–450 VDC)
Capacitance range	1–4700µF
Capacitance tolerance	–10 to +30%
Rated voltage	10–450 VDC
Temperature range	–40 to +125°C
Operational life time	27500 h at 105°C (case Ø = 20 mm)
Shelf life	5000 h at 0V +105°C or 10 years at 0V +40°C +40°C 10 years
Diameter range	10 – 20 mm



Dimensions table PEG 124 (mm)

D x L	Case code	D ±0.5	d ±0.03	L ±1	L_1 min	b + 3/–2 Box	b + 3/–2 Taped	Weight approx (g)
10 x 20	A	10	0.8	20.0	26.0	–	31	3
10 x 29	B	10	0.8	29.0	35.0	–	27	4
13 x 20	C	13	0.8	20.0	26.0	–	31	4
13 x 29	D	13	0.8	29.0	35.0	–	27	6
13 x 37	E	13	0.8	37.0	43.0	42	24	7
16 x 29	F	16	0.8	29.0	35.0	42	–	8
16 x 37	G	16	0.8	37.0	43.0	42	–	11
20 x 29	H	20	0.8	29.0	35.0	42	–	13
20 x 37	J	20	0.8	37.0	43.0	42	–	20
20 x 46	L	20	0.8	46.0	52.0	42	–	24

ARTICLE TABLE PEG 124 (125°C)

C_R µF	D x L mm	Case code	I_{RAC} * 125°C 100 Hz mA	I_{RAC} 60°C ≥5 kHz A	I_{RAC} 125°C ≥5 kHz A	ESR* 20°C 100 Hz Ω	ESR* 20°C 100 kHz Ω	L_{ESL} Approx. nH	Article code
10 VDC (U_R)									
1000	16 x 29	F	1035	4.6	1.7	0.20	0.14	10	PEG124EF4100Q
1500	16 x 37	G	1276	5.6	2.1	0.14	0.10	12	PEG124EG4150Q
2200	20 x 37	J	1804	8.0	2.9	0.09	0.06	15	PEG124EJ4220Q
3300	20 x 46	L	2088	8.8	3.2	0.07	0.05	17	PEG124EL4330Q
16 VDC (U_R)									
68	10 x 20	A	130	0.95	0.36	2.40	1.60	5	PEG124GA2680Q
100	10 x 20	A	191	1.2	0.45	1.70	1.10	5	PEG124GA3100Q
150	10 x 29	B	287	1.5	0.61	1.10	0.71	6	PEG124GB3150Q
220	10 x 29	B	315	1.5	0.70	0.80	0.54	6	PEG124GB3220Q
220	13 x 20	C	422	3.9	1.4	0.39	0.14	6	PEG124GC322AQ
330	13 x 29	D	515	2.6	1.1	0.50	0.33	8	PEG124GD3330Q
470	13 x 20	C	645	3.9	1.5	0.25	0.12	6	PEG124GC347AQ
470	13 x 29	D	632	3.1	1.1	0.37	0.25	8	PEG124GD3470Q
680	13 x 37	E	851	4.6	1.7	0.20	0.12	10	PEG124GE3680Q
680	16 x 29	F	850	4.0	1.5	0.26	0.18	10	PEG124GF3680Q
680	16 x 29	F	1005	7.6	2.7	0.13	0.05	10	PEG124GF368AQ
1000	16 x 29	F	1166	7.6	2.8	0.11	0.05	10	PEG124GF410AQ
1000	16 x 37	G	1031	4.8	1.8	0.19	0.13	12	PEG124GG4100Q
1500	16 x 37	G	1490	9.3	3.4	0.07	0.04	12	PEG124GG415AQ
1500	20 x 37	J	1372	6.0	2.2	0.14	0.10	15	PEG124GJ4150Q
2200	16 x 37	G	1720	9.3	3.4	0.06	0.04	12	PEG124GG422AQ
2200	20 x 46	L	1782	8.0	2.9	0.09	0.06	17	PEG124GL4220Q
3300	20 x 37	J	2251	11.8	4.1	0.04	0.02	15	PEG124GJ433AQ
4700	20 x 37	J	2685	12.7	5.0	0.04	0.02	15	PEG124GJ447AQ
25 VDC (U_R)									
47	10 x 20	A	141	1.1	0.44	2.40	1.30	5	PEG124HA2470Q
100	10 x 29	B	255	1.5	0.56	1.20	0.67	6	PEG124HB3100Q
220	13 x 20	C	452	3.1	1.2	0.46	0.20	6	PEG124HC322AQ
220	13 x 29	D	448	2.6	0.96	0.59	0.32	8	PEG124HD3220Q
330	13 x 20	C	525	3.1	1.2	0.37	0.20	6	PEG124HC333AQ
330	13 x 37	E	570	3.4	1.2	0.36	0.20	10	PEG124HE3330Q
470	16 x 29	F	806	4.7	1.7	0.25	0.14	10	PEG124HF3470Q
470	16 x 29	F	827	6.1	2.1	0.20	0.08	10	PEG124HF347AQ
680	16 x 29	F	946	6.0	2.1	0.17	0.08	10	PEG124HF368AQ
680	16 x 37	G	960	5.3	1.9	0.19	0.11	12	PEG124HG3680Q
1000	16 x 37	G	1248	7.8	2.8	0.11	0.05	12	PEG124HG410AQ
1000	20 x 37	J	1323	7.4	2.6	0.12	0.07	15	PEG124HJ4100Q
1500	16 x 37	G	1437	7.8	2.8	0.09	0.06	12	PEG124HG415AQ
1500	20 x 46	L	1659	8.9	3.2	0.09	0.05	17	PEG124HL4150Q
2200	20 x 37	J	1803	9.5	3.2	0.06	0.04	15	PEG124HJ422BQ
3300	20 x 37	J	2067	9.5	3.3	0.06	0.04	15	PEG124HJ433BQ
4000	20 x 46	L	2454	12.3	4.2	0.04	0.02	17	PEG124HL440BM
40 VDC (U_R)									
33	10 x 20	A	153	1.1	0.39	2.90	1.30	5	PEG124KA2330Q
68	10 x 29	B	221	1.5	0.56	1.40	0.65	6	PEG124KB2680Q
150	13 x 20	C	381	3.1	1.2	0.58	0.20	6	PEG124KC315AQ
150	13 x 29	D	416	2.8	1.0	0.62	0.29	8	PEG124KD3150Q
220	13 x 20	C	452	3.1	1.2	0.44	0.20	6	PEG124KC322AQ
220	13 x 37	E	487	3.5	1.3	0.44	0.19	10	PEG124KE3220Q
220	16 x 29	F	575	3.9	2.0	0.41	0.19	10	PEG124KF3220Q
330	16 x 29	F	739	6.1	2.1	0.24	0.08	10	PEG124KF333AQ
330	16 x 37	G	692	4.8	1.7	0.29	0.13	12	PEG124KG3330Q
470	16 x 29	F	827	6.1	2.1	0.20	0.08	10	PEG124KF347CQ
470	20 x 37	J	898	6.0	2.1	0.22	0.10	15	PEG124KJ3470Q

* Maximum values

ARTICLE TABLE PEG 124 (125°C)

C_R µF	D x L mm	Case code	I_{RAC} * 125°C 100 Hz mA	I_{RAC} 60°C ≥5 kHz A	I_{RAC} 125°C ≥5 kHz A	ESR* 20°C 100 Hz Ω	ESR* 20°C 100 kHz Ω	L_{ESL} Approx. nH	Article code
40 VDC (U_R)									
680	16 x 37	G	1048	7.7	2.7	0.13	0.05	12	PEG124KG368AQ
680	20 x 37	J	1132	7.3	2.6	0.15	0.07	15	PEG124KJ3680Q
1000	16 x 37	G	1242	7.8	2.8	0.11	0.05	12	PEG124KG410AQ
1000	20 x 46	L	1414	8.8	3.2	0.10	0.05	17	PEG124KL4100Q
1500	20 x 37	J	1598	9.5	3.3	0.07	0.04	15	PEG124KJ415AQ
2200	20 x 37	J	1900	9.6	3.5	0.06	0.04	15	PEG124KJ422AQ
63 VDC (U_R)									
10	10 x 20	A	76	0.9	0.35	5.90	1.60	5	PEG124MA2100Q
15	10 x 20	A	113	1.0	0.39	4.30	1.40	5	PEG124MA2150Q
22	10 x 20	A	134	1.1	0.43	3.40	1.20	5	PEG124MA2220Q
33	10 x 29	B	158	1.4	0.53	2.20	0.78	6	PEG124MB2330Q
47	10 x 29	B	190	1.6	0.57	1.60	0.55	6	PEG124MB2470Q
68	13 x 29	D	274	2.3	0.89	1.10	0.40	8	PEG124MD2680Q
100	13 x 29	D	355	3.0	1.0	0.74	0.26	8	PEG124MD3100Q
100	13 x 20	C	328	3.1	1.0	0.73	0.22	6	PEG124MC310AQ
150	16 x 29	F	491	4.0	1.4	0.50	0.18	10	PEG124MF3150Q
150	13 x 29	D	455	3.6	1.4	0.46	0.15	8	PEG124MD315AQ
220	16 x 29	F	647	6.1	2.1	0.29	0.08	10	PEG124MF322AQ
220	16 x 37	G	610	5.0	1.8	0.34	0.12	12	PEG124MG3220Q
330	16 x 29	F	737	6.1	2.1	0.24	0.08	10	PEG124MF333AQ
330	20 x 37	J	845	6.8	2.3	0.22	0.08	15	PEG124MJ3330Q
470	16 x 37	G	927	7.5	2.6	0.17	0.06	12	PEG124MG347AQ
470	20 x 46	L	1018	7.9	2.9	0.16	0.06	17	PEG124ML3470Q
680	16 x 37	G	1090	7.5	2.6	0.14	0.06	12	PEG124MG368AQ
1000	20 x 37	J	1399	9.2	3.1	0.09	0.04	15	PEG124MJ410AQ
1500	20 x 46	L	1715	10.2	3.5	0.07	0.04	17	PEG124ML415AQ

ARTICLE TABLE PEG 124 (105°C)

C_R µF	D x L mm	Case code	I_{RAC} * 105°C 100 Hz mA	I_{RAC} 60°C ≥5 kHz A	I_{RAC} 105°C ≥5 kHz A	ESR* 20°C 100 Hz Ω	ESR* 20°C 100 kHz Ω	L_{ESL} Approx. nH	Article code
100 VDC (U_R)									
4.7	10x20	A	50	0.65	0.20	16.00	2.80	5	PEG124PA147CQ
22	10x29	B	122	1.24	0.37	3.00	1.10	6	PEG124PB222VQ
47	13x29	D	206	1.90	0.58	1.50	0.54	8	PEG124PD247VQ
47	13x37	E	192	1.50	0.45	1.80	0.92	10	PEG124PE247CQ
100	16x29	F	354	3.20	0.98	0.70	0.26	10	PEG124PF310VQ
220	16x37	G	536	3.60	1.10	0.50	0.30	12	PEG124PG322CQ
470	20x46	L	904	6.30	1.90	0.21	0.12	17	PEG124PL347VQ
200 VDC (U_R)									
5.6	10 x 20	A	49	0.38	0.11	20.00	10.0	5	PEG124RA156BM
10	10 x 29	B	65	0.47	0.17	10.00	4.20	6	PEG124RB2100Q
15	13 x 29	D	96	0.74	0.26	6.30	2.40	8	PEG124RD2150Q
22	13 x 29	D	120	0.86	0.31	4.60	1.90	8	PEG124RD2220Q
33	16 x 29	F	167	1.20	0.42	3.10	1.30	10	PEG124RF2330Q
47	16 x 29	F	210	1.50	0.53	2.20	0.92	10	PEG124RF2470Q
68	20 x 29	H	294	2.00	0.71	1.50	0.66	12	PEG124RH2680Q
100	20 x 37	J	353	2.40	0.88	1.00	0.44	15	PEG124RJ3100Q
150	20 x 46	L	446	3.10	1.10	0.69	0.30	17	PEG124RL3150Q

* Maximum values

ARTICLE TABLE PEG 124 (105°C)

C_R µF	D x L mm	Case code	I_{RAC} * 105°C 100 Hz mA	I_{RAC} 60°C ≥5 kHz A	I_{RAC} 105°C ≥5 kHz A	ESR* 20°C 100 Hz Ω	ESR* 20°C 100 kHz Ω	L_{ESL} Approx. nH	Article code
350 VDC (U_R)									
4.7	10 x 29	B	55	0.37	0.14	17.00	7.50	6	PEG124UB1470Q
6.8	13 x 29	D	92	0.59	0.22	9.00	4.20	8	PEG124UD1680Q
10	13 x 29	D	102	0.65	0.24	7.60	3.60	8	PEG124UD2100Q
22	16 x 29	F	184	1.20	0.44	3.30	1.50	10	PEG124UF2220Q
33	20 x 29	H	248	1.60	0.56	2.30	1.10	12	PEG124UH2330Q
47	20 x 37	J	328	2.10	0.77	1.50	0.66	15	PEG124UJ2470Q
68	20 x 46	L	389	2.50	0.91	1.10	0.50	17	PEG124UL2680Q
400 VDC (U_R)									
2.2	10 x 29	B	42	0.27	0.11	25.00	12.00	6	PEG124VB1220Q
4.7	13 x 29	D	78	0.52	0.21	11.00	5.10	8	PEG124VD1470Q
10	13 x 37	E	116	0.70	0.26	5.90	3.00	10	PEG124VE2100Q
22	16 x 37	G	209	1.40	0.50	2.70	1.20	12	PEG124VG2220Q
33	20 x 37	J	304	1.90	0.71	1.60	0.76	15	PEG124VJ2330Q
47	20 x 46	L	377	2.40	0.89	1.20	0.53	17	PEG124VL2470Q
450 VDC (U_R)									
1.0	10 x 20	A	30	0.21	0.08	49.00	20.00	5	PEG124YA1100Q
2.2	10 x 29	B	43	0.29	0.11	24.00	11.00	6	PEG124YB1220Q
3.3	10 x 29	B	55	0.38	0.14	17.00	7.30	6	PEG124YB1330Q
4.7	13 x 29	D	79	0.54	0.20	11.00	4.80	8	PEG124YD1470Q
6.8	13 x 29	D	97	0.61	0.22	8.30	4.00	8	PEG124YD1680Q
10	16 x 29	F	133	0.82	0.40	5.70	2.80	10	PEG124YF2100Q
10	16 x 29	F	141	1.40	0.30	4.60	1.70	10	PEG124YF210AT
15	16 x 37	G	171	1.10	0.41	3.60	1.70	12	PEG124YG2150Q
15	20 x 29	H	185	1.60	0.49	3.30	1.40	12	PEG124YH215AQ
22	20 x 29	H	240	1.60	0.56	2.40	1.10	12	PEG124YH2220Q
22	20 x 37	J	242	2.30	0.67	2.10	0.80	15	PEG124YJ222AT
33	20 x 37	J	306	2.00	0.72	1.60	0.74	15	PEG124YJ2330Q
47	20 x 46	L	377	2.40	0.89	1.20	0.53	17	PEG124YL2470Q

* Maximum values

OPERATIONAL LIFE AND RIPPLE CURRENT, PEG124 (125°C)

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

Diagram valid for Ø20 case size.
Operational life, Ø16 case size: 0.67 x diagram value
Ø13 case size: 0.44 x diagram value
Ø10 case size: 0.37 x diagram value

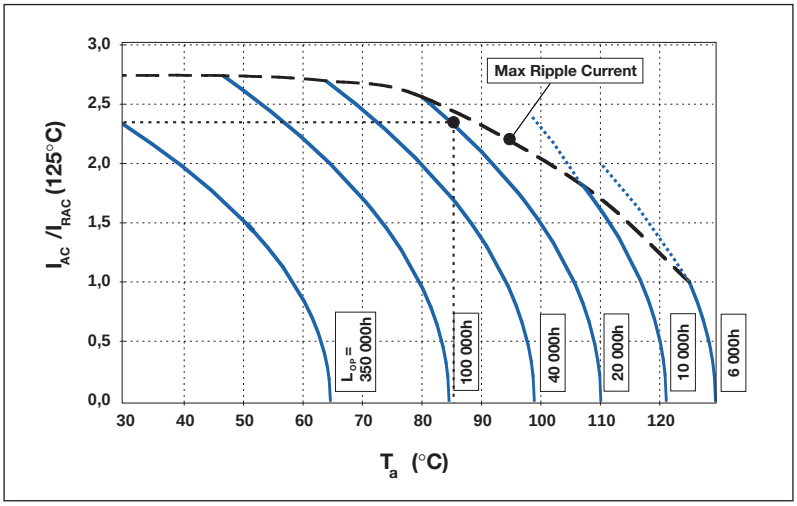
Example:
Article: PEG124MG368AQ (Ø16 x 37 mm)
Ambient temperature (T_a):85°C
Ripple current, at 10kHz (I_{AC}): 6.0 A

I_{RAC}(125°C, ≥ 5kHz) = 2.6 A (from data table)
→ I_{AC}/ I_{RAC}(125°C) = 2.3

Operational life: Interpolation between the L_{op}-curves → L_{op} ~20 kh x 0.67 = 13kh (blue curves)
Ø16 -factor

When the capacitor load is at 100Hz, use I_{AC}/ I_{RAC}(125°C, 100Hz) as input value to the diagram (see data table). At other frequencies use I_{AC}/ I_{RAC}(125°C, »5kHz) x 1/Corr =

Frequency correction factor, for ripple current (Corr):



	FREQUENCY			
	300 Hz	1 kHz	5 kHz	100 kHz
Correction factor (Corr) (Typical value)	0.57	0.80	1.00	1.04

OPERATIONAL LIFE AND RIPPLE CURRENT, PEG124 (105°C)

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

Diagram valid for Ø20 case size.
Operational life, Ø16 case size: 0.67 x diagram value
Ø13 case size: 0.44 x diagram value
Ø10 case size: 0.37 x diagram value

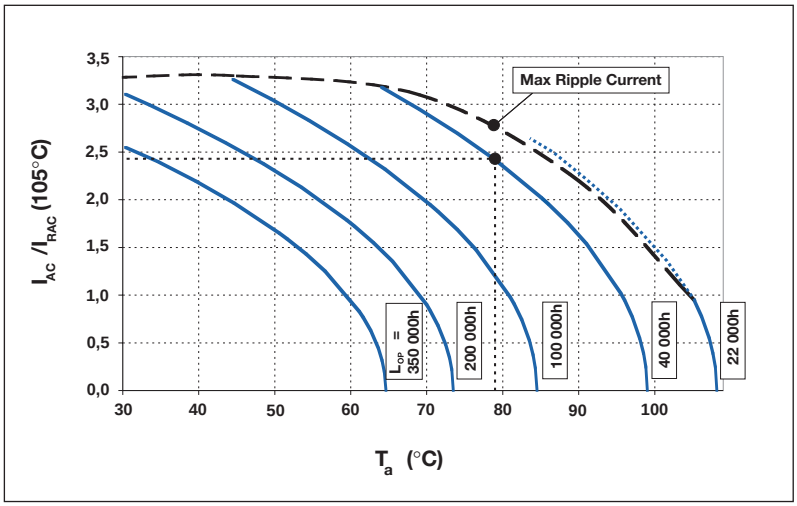
Example:
Article: PEG124RL3150Q (Ø20 x 46 mm)
Ambient temperature (T_a): 79°C
Ripple current, at 10kHz (I_{AC}): 2.7 A

I_{RAC}(105°C, ≥ 5kHz)= 1.10 A (from data table)
→ I_{AC}/ I_{RAC}(105°C) = 2.45

Operational life: Interpolation between the L_{op}-curves → L_{op} ~ 40 kh (blue curves)

When the capacitor load is at 100Hz, use I_{AC}/ I_{RAC}(105°C, 100Hz) as input value to the diagram (see data table). At other frequencies use I_{AC}/ I_{RAC}(105°C, ≥ 5kHz) x 1/Corr =

Frequency correction factor, for ripple current (Corr):



	FREQUENCY			
	300 Hz	1 kHz	5 kHz	100 kHz
Correction factor (Corr) (Typical value)	0.57	0.80	1.00	1.04

RELIABILITY

Estimated field failure rate: <2 ppm/year. The expected failure rate, for this capacitor range, is based on field experience for capacitors with structural similarity. This failure rate is valued during first year of operation.
Expected failure rate thereafter: <1 ppm/y. (Until end of specified operational life)

LEAKAGE CURRENT

Rated leakage current, I_{RL} (µA)
Rated voltage, U_R (V)
Rated capacitance, C_R (µF)

For $U_R \leq 160$ V and $C_R \times U_R \leq 1000$
$I_{RL} = 0.01 \times C_R \times U_R$
For $U_R \leq 160$ V and $C_R \times U_R > 1000$
$I_{RL} = 0.003 \times C_R \times U_R + 4$
For $U_R > 160$ V
$I_{RL} = 0.006 \times C_R \times U_R + 4$

CUSTOMER DESIGN

On request PEG124 can be designed in other capacitance values.

ORDERING INFORMATION

For further ordering information please see page 8.

Pos 1–20

P	E	G	1	2	4	K	D	3	1	5	0	Q	L	1					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Capacitance tolerances:
Pos. 13: Q: –10 to +30%
M: –20 to +20%

T1: Taped delivery on reels
L1: Packed in boxes

Quantities and weights

CASE CODE	A	B	C	D	E	F	G	H	J	L
Weight approx (g)	3	4	4	6	7	8	11	13	20	24
Standard content per reel	500	500	400	400	400[1]					
Standard box quantity	250[1]	200[1]	250[1]	200[1]	150	125	100	150	125	100

[1] On request.