

Overview

Polypropylene metallized film with rectangular plastic box type filled with resin and 2 or 4 tinned copper wires.

Applications

Typical applications include DC filtering and energy storage.

Benefits

- Self-healing
- Low losses
- High ripple current
- High capacitance density
- High contact reliability
- Suitable for high frequency applications



Part Number Decoding

C4	A	E	G	B	W	4	4	5	0	A	1	W	J
Series			DC Voltage	Case Code	Terminals Code	Capacitance Code (pF)				Variants	Terminals Diameter (mm)	Case Letter ²	Tolerance
C4 = MKP Power Capacitors	A = Box - Wire Terminals	E = DC Link	E = 300 V G = 450 V H = 600 V I = 800 V J = 700 V K = 750 V L = 500 V M = 850 V N = 1000 V O = 900 V Q = 1100 V U = 1300 V	B = Box plastic case	U = Single copper wire W = Double copper wire Z = Special wire	Digits 9, 10, & 11 indicate the first 3 digits of capacitance value. Digit 8 indicates the number of zeros that must be added to obtain rated capacitance in pF.				A = Standard B = Special H ¹ = 100°C	1 = 0.8 2 = 1 3 = 1.2	0, A, B, C, D, E, F, G, H, J, L, M, N, W, X, Y, 1, 2	J = 5% K = 10%

¹ True 100°C high temperature film with no voltage derating available on request.

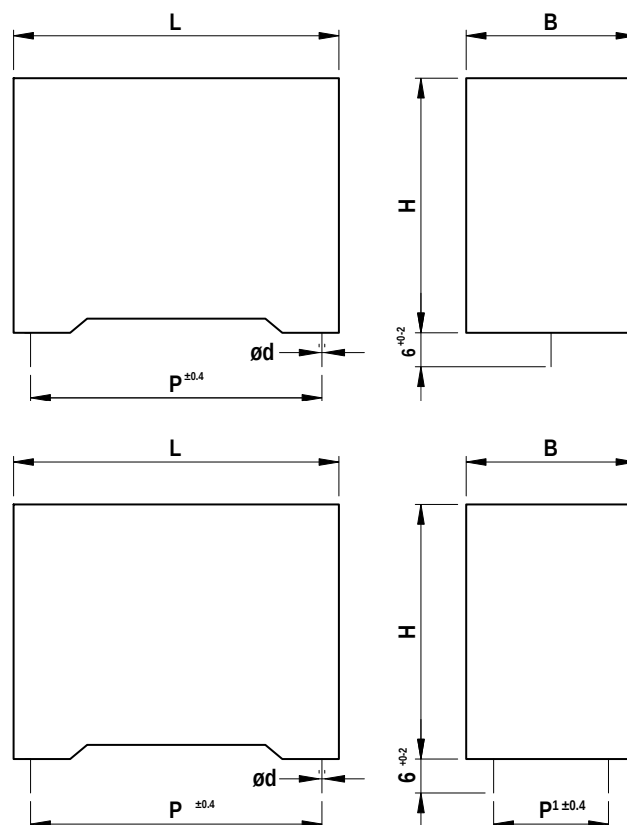
² Please see Dimension Table.

Lead Wire Table

Wire	0.8 mm	1.2 mm
Diameter	20 AWG	16 AWG
13th Digit Code	1	3

Dimensions – Millimeters

Case Code	B	H	L	P	P ¹
A	10	20	32	27.5	
B	13	22	32	27.5	
C	14	28	32	27.5	
D	15	24	32	27.5	
E	18	33	32	27.5	
F	20	40	41.5	37.5	10.2
G	22	37	32	27.5	
H	24	44	41.5	37.5	10.2
J	28	37	42.5	37.5	10.2
L	30	45	42	37.5	20.3
M	30	45	57.5	52.5	20.3
N	35	50	57.5	52.5	20.3
W	11	20	31.5	27.5	
X	13	25	31.5	27.5	
Y	14	28	31.5	27.5	
1	19	29	31.5	27.5	
2	22	37	31.5	27.5	
0	Internal				



Qualification

Reference Standards	IEC 61071
Climatic Category	40/85/56 according to IEC 60068-1

General Technical Data

Dielectric	Polypropylene metallized film, non inductive self-healing
Application	DC filtering / DC link
Maximum Operating Temperature	+105°C
Upper Temperature T_{MAX}	+85°C IEC 61071, Endurance Test Temperature
Lower Temperature T_{MIN}	-40°C
Protection	Solvent resistant plastic case UL 94 V-0 Thermosetting resin sealing UL 94 V-0 compliant
Installation	Any position
Leads	Tinned copper wires, standard lead wire length 6 (0/-2) mm
Packaging	Packed in cardboard trays with protection for the terminals
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2002/95/EC

Electrical Characteristics

Capacitance Tolerance	±5% at $T = 25^{\circ}\text{C}$
Dissipation Factor PP Typical ($\tan\delta_0$)	≤ 0.0002 at 10 kHz with $T = 25^{\circ}\text{C} \pm 5^{\circ}\text{C}$
Surge Voltage	$1.5 * V_{NDC}$ for maximum 10 times in lifetime at 25°C
Overvoltage (IEC 61071)	$1.15 * V_{NDC}$ for maximum 30 minutes, once per day
	$1.3 * V_{NDC}$ for maximum 1 minute, once per day
Peak Non-Repetitive Current	$1.5 * I_{pkr}$ - maximum 1,000 times in lifetime
Insulation Resistance	$IR \times C \geq 30,000$ seconds at 100 VDC 1 minute $T = 25^{\circ}\text{C}$
Capacitance Deviation in Operation	±1.5% maximum on capacitance value measured at $T = 25^{\circ}\text{C}$
Permissible Relative Humidity	Annual average ≤ 70%, 85% on 30 days/year randomly distributed throughout the year. Dewing not admissible.

Life Expectancy

Life Expectancy	100,000 hours at V_{NDC} at hot spot temperature $T_{HS} = 85^{\circ}\text{C}$
Capacitance Drop at End of Life	-5% (typical)
Failure Rate IEC 61709	300 FIT at V_{NDC} at hot spot temperature $T_{HS} = 85^{\circ}\text{C}$

Test Method

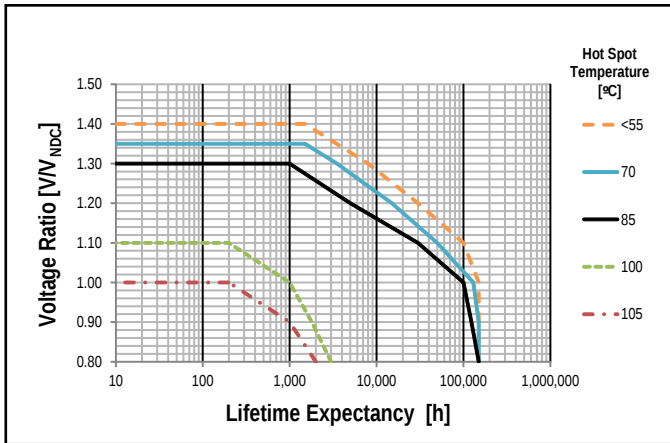
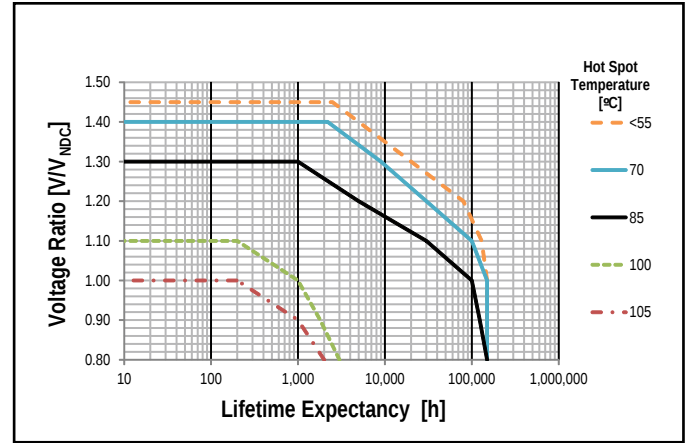
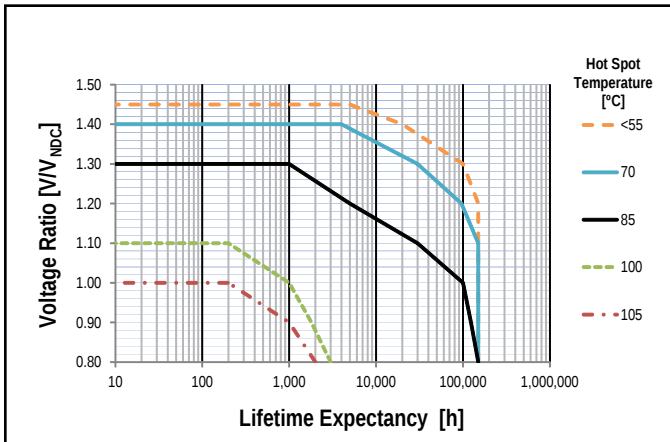
Test Voltage Between Terminals	$1.5 * V_{NDC}$ for 10 seconds or $1.65 V_{NDC}$ for 2 seconds at $T = 25^{\circ}\text{C}$
Test Voltage Between Terminals and Case	3.2 k VAC 50 Hz for 2 seconds
Damp Heat	IEC 60068-2-78
Change of Temperature	IEC 60068-2-14

Table 1 – Ratings & Part Number Reference

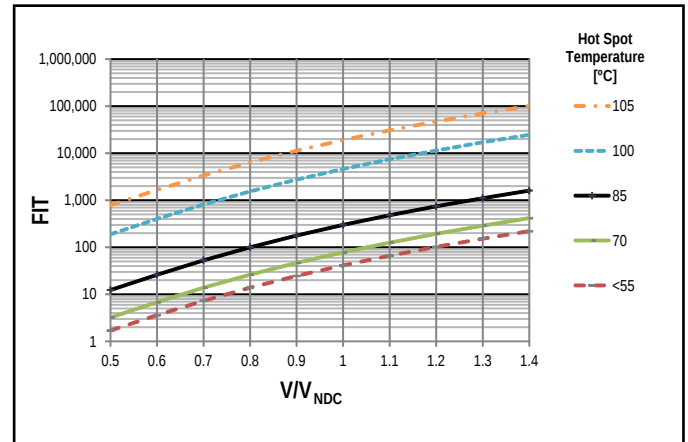
VDC	Cap Value (μF)	Dimensions (mm)					dV/dt (V/μs)	I _{pr} A	ESL nH	ESR 70°C @ 10 kHz mΩ	I _{rms} * 70°C @ 10 kHz A	RTH (Hs/Amb)	Part Number
		B	H	L	P	P1							
450	4.5	11	20	31.5	27.5	\	14	65	25	14.2	4.5	44	C4AEGBU4450A1WJ
450	6.8	13	25	31.5	27.5	\	15	101	25	10	6	36	C4AEGBU4680A1XJ
450	10	14	28	31.5	27.5	\	14	145	26	7.4	7.5	33	C4AEGBU5100A1YJ
450	12.5	19	29	31.5	27.5	\	15	187	26	6.2	8.5	29	C4AEGBU5125A11J
450	20	22	37	31.5	27.5	\	15	303	28	4.8	11	23	C4AEGBU5200A12J
450	30	20	40	41.5	37.5	10.2	10	298	30	4.1	13	20	C4AEGBW5300A3FJ
450	35	28	37	42.5	37.5	10.2	10	355	30	3.5	14	18	C4AEGBW5350A3JJ
450	40	24	44	41.5	37.5	10.2	10	406	30	3.1	16	17	C4AEGBW5400A3HJ
450	50	30	45	42	37.5	20.3	10	508	30	2.5	18	15	C4AEGBW5500A3LJ
450	75	30	45	57.5	52.5	20.3	7	503	35	3.4	18	12	C4AEGBW5750A3MJ
450	100	35	50	57.5	52.5	20.3	7	677	35	2.6	22	10	C4AEGBW6100A3NJ
600	3.3	11	20	31.5	27.5	\	17	55	25	17	4	44	C4AEHBU4330A1WJ
600	5.6	13	25	31.5	27.5	\	17	94	25	10.7	6	36	C4AEHBU4560A1XJ
600	7	14	28	31.5	27.5	\	17	118	26	9	7	33	C4AEHBU4700A1YJ
600	10	19	29	31.5	27.5	\	17	169	26	6.8	8.5	29	C4AEHBU5100A11J
600	15	22	37	31.5	27.5	\	17	253	28	5.3	10.5	23	C4AEHBU5150A12J
600	20	20	40	41.5	37.5	10.2	11	229	30	5.3	11	20	C4AEHBU5200A3FJ
600	30	28	37	42.5	37.5	10.2	11	337	30	3.6	14	18	C4AEHBU5300A3JJ
600	40	30	45	42	37.5	20.3	11	458	30	2.8	18	15	C4AEHBU5400A3LJ
600	55	30	45	57.5	52.5	20.3	8	425	35	4.1	16.5	12	C4AEHBU5550A3MJ
600	75	35	50	57.5	52.5	20.3	8	579	35	3.1	20.5	10	C4AEHBU5750A3NJ
700	2.7	11	20	31.5	27.5	\	19	51	25	18.3	4	44	C4AEJBU4270A1WJ
700	4	13	25	31.5	27.5	\	19	77	25	12.9	5.5	36	C4AEJBU4400A1XJ
700	5	14	28	31.5	27.5	\	19	96	26	10.7	6	33	C4AEJBU4500A1YJ
700	8	19	29	31.5	27.5	\	19	154	26	7.3	8	29	C4AEJBU4800A11J
700	12.5	22	37	31.5	27.5	\	19	241	28	5.5	10	23	C4AEJBU5125A12J
700	15	20	40	41.5	37.5	10.2	13	196	30	6.2	10	20	C4AEJBW5150A3FJ
700	20	28	37	42.5	37.5	10.2	13	262	30	4.7	12.5	18	C4AEJBW5200A3JJ
700	22	24	44	41.5	37.5	10.2	13	288	30	4.3	13	17	C4AEJBW5220A3HJ
700	30	30	45	42	37.5	20.3	13	389	30	3.2	16.5	15	C4AEJBW5300A3LJ
700	45	30	45	57.5	52.5	20.3	9	389	35	4.4	16	12	C4AEJBW5450A3MJ
700	55	35	50	57.5	52.5	20.3	9	485	35	3.6	19	10	C4AEJBW5550A3NJ
700	60	35	50	57.5	52.5	20.3	9	530	35	3.4	19.5	10	C4AEJBW5600A3NJ
900	1.5	11	20	31.5	27.5	\	24	36	25	26.3	3.5	44	C4AEOBU4150A1WJ
900	2.7	13	25	31.5	27.5	\	24	65	25	15.3	5	36	C4AEOBU4270A1XJ
900	3.3	14	28	31.5	27.5	\	24	79	26	12.9	5.5	33	C4AEOBU4330A1YJ
900	5	19	29	31.5	27.5	\	24	120	26	9.1	7	29	C4AEOBU4500A11J
900	8	22	37	31.5	27.5	\	24	193	28	6.6	9.5	23	C4AEOBU4800A12J
900	12	20	40	41.5	37.5	10.2	16	190	30	6.3	10	20	C4AEOBW5120A3FJ
900	14	28	37	42.5	37.5	10.2	16	229	30	5.4	11.5	18	C4AEOBW5140A3JJ
900	16	24	44	41.5	37.5	10.2	16	256	30	4.8	13	17	C4AEOBW5160A3HJ
900	20	30	45	42	37.5	20.3	16	321	30	3.9	15	15	C4AEOBW5200A3LJ
900	30	30	45	57.5	52.5	20.3	11	324	35	5.2	15	12	C4AEOBW5300A3MJ
900	40	35	50	57.5	52.5	20.3	11	428	35	4	18	10	C4AEOBW5400A3NJ
1100	1	11	20	31.5	27.5	\	28	28	25	33.1	3	44	C4AEQBU4100A1WJ
1100	1.8	13	25	31.5	27.5	\	29	52	25	19.1	4.5	36	C4AEQBU4180A1XJ
1100	2.2	14	28	31.5	27.5	\	29	63	26	16	5	33	C4AEQBU4220A1YJ
1100	3.3	19	29	31.5	27.5	\	29	95	26	11.2	6.5	29	C4AEQBU4330A11J
1100	5	22	37	31.5	27.5	\	29	145	28	8.2	8.5	23	C4AEQBU4500A12J
1100	8	20	40	41.5	37.5	10.2	20	157	30	7.9	9	20	C4AEQBW4800A3FJ
1100	10	28	37	42.5	37.5	10.2	20	196	30	6.3	11	18	C4AEQBW5100A3JJ
1100	12	30	45	42	37.5	20.3	20	235	30	5.3	13	15	C4AEQBW5120A3LJ
1100	20	30	45	57.5	52.5	20.3	13	262	35	6.5	13	12	C4AEQBW5200A3MJ
1100	25	35	50	57.5	52.5	20.3	13	331	35	5.2	16	10	C4AEQBW5250A3NJ
1100	27	35	50	57.5	52.5	20.3	13	354	35	4.9	16.5	10	C4AEQBW5270A3NJ
VDC	Cap Value (μF)	B (mm)	H (mm)	L (mm)	P (mm)	P1 (mm)	dV/dt (V/μs)	I _{pr} A	ESL	ESR	I _{rms} A	RTH (Hs/Amb)	Part Number

* I_{rms} value that leads to a ΔT of ~ 15°C in the hot spot → T_{HS} = T_{AMB} + ΔT = 70°C + 15°C = 85°C

Lifetime Expectancy/Failure Quota Graphs

Lifetime Curve $V_{NDC} = 450$ V-Lifetime Curve $V_{NDC} = 600$ V- and $V_{NDC} = 700$ V-Lifetime Curve $V_{NDC} = 900$ V- and $V_{NDC} = 1,100$ V-

FIT @ Hot Spot Temperatures



Notes:

$$T_{HS} = T_{AMB} + \Delta T$$

$$\Delta T = ESR * I_{rms}^2 * R_{th}$$

I_{rms} should be limited to values granting $\Delta T \leq 30^\circ\text{C}$

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, like Lead (Pb), in electronic equipment. All products in this catalog are produced to help our customers' obligations to guarantee their products to 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 like 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 like LF = Lead Free or LFW = Lead Free Wires on the label.

All KEMET power film products are RoHS Compliant.



RoHS Compliant

Materials & Environment

The selection of materials used by KEMET for the production of capacitors is the result of extensive experience and constant attention to environmental protection. KEMET selects its suppliers according to ISO 9001 standards and carries out statistical analysis on the materials purchased before acceptance. All materials are, to the company's present knowledge, non-toxic and free from Cadmium, Mercury, Chrome and compounds, PCB (Polychlorine Triphenyl), Bromide and Chlorine Dioxins Bromurate Chlorurate, CFC and HCFC and Asbestos.

Insulation Resistance

When the capacitor temperature increases, the insulation resistance decreases. This is due to increased electron activity. Low insulation resistance can also be the result of moisture trapped in the windings, caused by a prolonged exposure to excessive humidity.

Dissipation Factor

Dissipation factor is a complex function involved with the inefficiency of the capacitor. The $\tan \delta$ may change up and down with increased temperature. For more information, please refer to Performance Characteristics.

Hermetically Sealed Capacitors

When the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor which can result in leakage, impregnation, filling fluid or moisture susceptibility.

Resin Encased/Wrap & Fill Capacitors

The resin seals on resin encased and wrap and fill capacitors will withstand short-term exposure to high humidity environments without degradation. Resins and plastic tapes will form a pseudo-impervious barrier to humidity and chemicals. These case materials are somewhat porous and through osmosis can cause contaminants to enter the capacitor. The second area of contaminated absorption is the lead-wire/resin interface. Since resins cannot bond 100% to tinned wires, there can be a path formed up to the lead wire into the capacitor section. Aqueous cleaning of circuit boards can aggravate this condition.

Barometric Pressure

The altitude at which hermetically sealed capacitors are operated controls the voltage rating of the capacitor. As the barometric pressure decreases, the susceptibility to terminal arc-over increases. Non-hermetic capacitors can be affected by internal stresses due to pressure changes. This can be in the form of capacitance changes or dielectric arc-over as well as low insulation resistance. Heat transfer can also be affected by altitude operation. Heat generated in operation cannot be dissipated properly and can result in high R^{12} losses and eventual failure.

Radiation

Radiation capabilities of capacitors must be taken into consideration. Electrical degradation in the form of dielectric embitterment can take place causing shorts or opens.

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Paris, France
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Sasso Marconi, Italy
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Milan, Italy
Tel: 39-02-57518176

Rome, Italy
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Tel: 49-8191-3350800

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Tel: 44-1236-434455

Färjestaden, Sweden
Tel: 46-485-563934

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: 86-10-5829-1711

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

Taipei, Taiwan
Tel: 886-2-27528585

Southeast Asia

Singapore
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

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
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Although we design and manufacture our 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.

