C44U Series, 600 – 1,300 VDC, for DC Link

Overview

The C44U Series is a polypropylene segmented metallized film with cylindrical aluminium can type filled with resin, screw terminals and plastic deck.

Applications

Typical applications include DC filtering and energy storage.

Benefits

- Controlled self-healing
- Low losses
- High ripple current
- High capacitance density
- Long lifetime

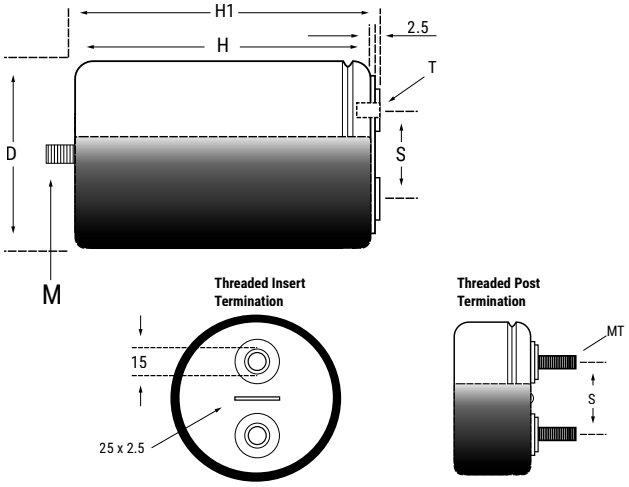


Part Number System

C4	4	U	Q	G	T	6	5	0	0	F	8	S	K
Series			DC Voltage	Case and Fixing	Terminals Code	Capacitance Code (pF)				Variants	Case Diameter	Film Type	Tolerance
C4 = MKP Capacitors for Power Applications	4 = Cylindrical types	U = DC link	H = 600 V J = 700 V O = 900 V Q = 1,100 V U = 1,300 V	G = Cylindrical case with threaded bolt M12 E = Cylindrical case without threaded bolt	T = M6 female terminals Q = M8 male terminals Y = M8 female terminals	Digits 9, 10 & 11 indicate the first 3 digits of capacitance value. Digit 8 indicates the number of zeros to be added.				A = 85°C Hot Spot temperature series F/G = 70°C Hot Spot temperature series	7 = 76 mm 8 = 85 mm	T = Standard film S = Segmented film	J = 5% K = 10%

© KEMET Electronics Corporation • P.O. Box 5928 • Greenville, SC 29606 • 864-963-6300 • www.kemet.com

Dimensions – Millimeters



D	H	H1	S	Threaded Insert Terminations (T)	Threaded Post Terminations (MT)	Mounting Stud (M)
+1/-0	+0.5/-0	±1	±0.2			
76	55	61	31.7	M6x12	M8x22.5	M12x16
76	70	76	31.7	M6x12	M8x22.5	M12x16
76	95	101	31.7	M6x12	M8x22.5	M12x16
76	120	126	31.7	M6x12	M8x22.5	M12x16
76	140	146	31.7	M6x12	M8x22.5	M12x16
85	55	61	31.7	M6x12	M8x22.5	M12x16
85	70	76	31.7	M6x12	M8x22.5	M12x16
85	95	101	31.7	M6x12	M8x22.5	M12x16
85	120	126	31.7	M6x12	M8x22.5	M12x16
85	124.5	126	32	M6x10	M8x22.5	M12x16
85	140	146	31.7	M6x12	M8x22.5	M12x16
85	155	161	31.7	M6x12	M8x22.5	M12x16
85	174	180	31.7	M6x12	M8x22.5	M12x16
85	264	270	31.7	M6x12	M8x22.5	M12x16

Qualifications

Reference Standards	IEC 61071
IEC Climatic Category	40/85/21 according to IEC 60068-1

General Technical Data

Dielectric	Polypropylene Metallized Film – non inductive self-healing
Application	DC Filtering/DC Link
Climatic Category	40/85/21 IEC 60068–1
Maximum Operating Temperature	+90°C
Upper Temperature T_{MAX} Group A	+85°C IEC 61071 – Endurance Test Temperature
Upper Temperature T_{MAX} Group B	+70°C IEC 61071 – Endurance Test Temperature
Lower Temperature T_{min}	–40°C
Standard	IEC 61071
Protection	Aluminium case with or without, threaded bolt M12
	Plastic deck flame retardant execution UL 94 V–0
	Thermosetting resin sealing UL 94 V–0 compliant
Installation	Any position
Leads	High current M6 or M8 terminals
Packaging	Packed in cardboard boxes with protection for the terminals
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2002/95/EC

Electrical Characteristics

Capacitance Tolerance	±10% at +25°C
Dissipation Factor (DF)	≤ 0.0002 at 10 kHz with T = 25°C ±5°C
Surge Voltage	1.5 x V_{NDC} for maximum 10 times in lifetime at +25°C
Over-Voltage (IEC 61071)	1.15 x V_{NDC} for maximum 30 minimum, once per day
	1.3 x V_{NDC} for maximum 1 minimum, once per day
Peak Non-Repetitive Current	1.5 x I_{pkr} maximum 1,000 times in lifetime
Insulation Resistance	IR x C ≥ 30,000 seconds at 100 VDC 1 minute at +25°C
Capacitance Deviation in Operation	±1.5% maximum on capacitance value measured at +25°C
Permissible Relative Humidity	Annual average ≤ 70%; 85% on 30 days/year randomly distributed throughout the year. Dewing not admissible.

Life Expectancy

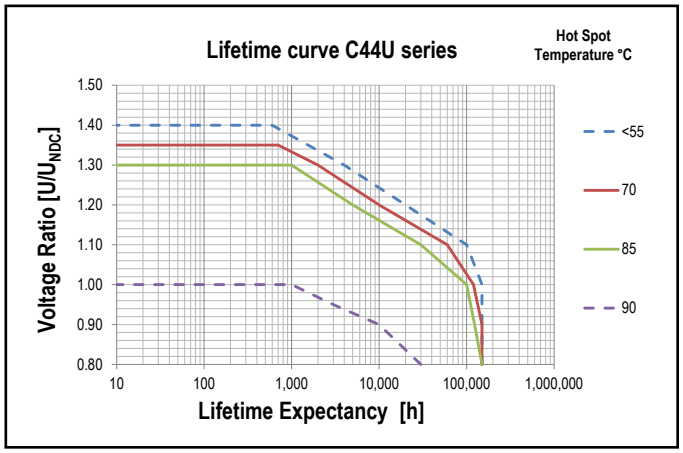
Life Expectancy – Group A	100,000 hours at V_{NDC} @ Hot-Spot temperature T_{HS} = 85°C
Life Expectancy – Group B	100,000 hours at V_{NDC} @ Hot-Spot temperature T_{HS} = 70°C
Capacitance drop at end of life	–10% (typical)
Failure Rate IEC 61709	50 FIT at V_{NDC} at reference T_{HS} (see FIT curves)

Test Method

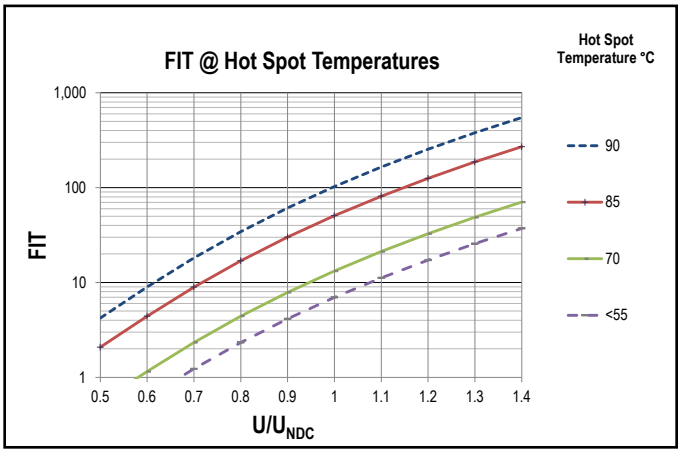
Test voltage between terminals	1.5 x V_{NDC} for 10 seconds or 1.65 V_{NDC} for 2 seconds at 25°C
Test voltage between terminals and case	3.2 kVAC 50 Hz for 2 seconds
Damp Heat	IEC 60068–2–78
Change of temperature	IEC 60068–2–14

Lifetime Expectancy/Failure Quota Graphs

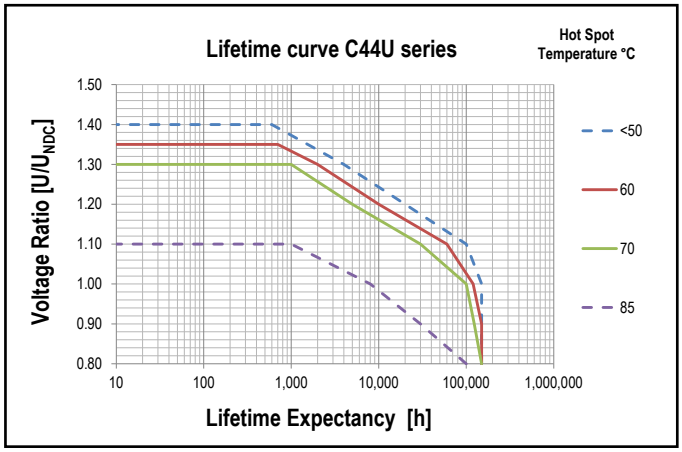
Lifetime Curve Group A – Heavy Duty



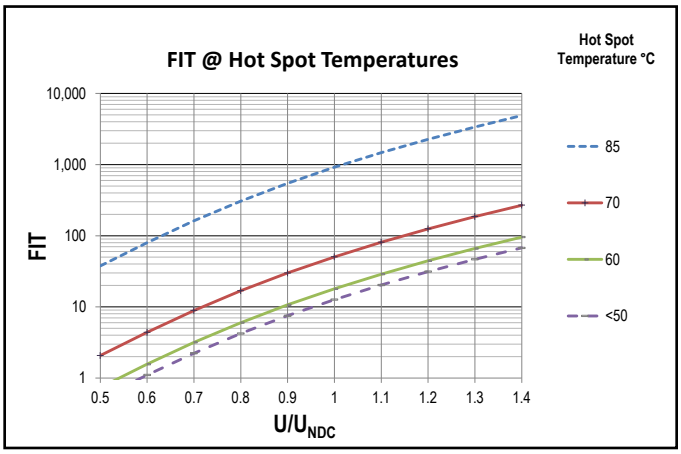
FIT Group A – Heavy Duty



Lifetime Curve Group B – Standard Duty



FIT Group B – Standard Duty



Notes:
$T_{HS} = T_{AMB} + \Delta T$
$\Delta T = ESR * I_{rms}^2 * Rth$
I_{rms} should be limited to values granting $\Delta T \leq 45°C$

Table 1A – Ratings & Part Number Reference

Cap Value (µF)	VDC	Maximum Dimensions (mm)			Ripple Current	Peak Current	ESR	ESL	Thermal Res	dV/dt (V/µs)	Pkg Qty	Weight (grams)	Part Number Group A Heavy Duty
		D	H	H1	10 kHz 40°C (A)[1]	(A)	10 kHz (mΩ)	(nH)	(°C/W)				
120	700	76	55	61	63	2520	1.1	36	9.9	21	18	280	C44UJGT6120A7TK
160	700	85	55	61	73	3360	0.9	36	8.6	21	10	354	C44UJGT6160A8TK
175	700	76	70	76	62	2450	1.4	40	8.2	14	18	348	C44UJGT6175A7TK
225	700	85	70	76	70	3150	1.2	40	7.2	14	10	414	C44UJGT6225A8TK
350	700	76	120	126	55	2450	2.8	50	5.3	7	9	569	C44UJGT6350A7SK
425	700	76	140	146	55	2550	3.2	60	4.6	6	9	656	C44UJGT6425A7SK
450	700	85	120	126	65	3150	2.3	50	4.6	7	5	723	C44UJGT6450A8SK
550	700	85	140	146	65	3300	2.6	60	4.1	6	5	831	C44UJGT6550A8SK
75	900	76	55	61	57	1950	1.4	36	9.9	26	18	283	C44UOGT5750A7TK
100	900	85	55	61	65	2600	1.2	36	8.6	26	10	355	C44UOGT6100A8TK
110	900	76	70	76	57	1870	1.6	40	8.2	17	18	324	C44UOGT6110A7TK
150	900	85	70	76	65	2550	1.4	40	7.2	17	10	437	C44UOGT6150A8TK
220	900	76	120	126	50	1980	3.3	50	5.3	9	9	574	C44UOGT6220A7SK
275	900	76	140	146	50	1925	3.8	60	4.6	7	9	654	C44UOGT6275A7SK
300	900	85	120	126	60	2700	2.7	50	4.6	9	5	711	C44UOGT6300A8SK
350	900	85	140	146	60	2450	3.0	60	4.1	7	5	833	C44UOGT6350A8SK
50	1100	76	55	61	52	1550	1.6	36	9.9	31	18	265	C44UQGT5500A7TK
70	1100	85	55	61	62	2170	1.3	36	8.6	31	10	356	C44UQGT5700A8TK
75	1100	76	70	76	58	1575	1.6	40	8.2	21	18	352	C44UQGT5750A7TK
100	1100	85	70	76	60	2100	1.7	40	7.2	21	10	414	C44UQGT6100A8TK
150	1100	76	120	126	45	1650	4.1	50	5.3	11	9	577	C44UQGT6150A7SK
190	1100	76	140	146	47	1710	4.3	60	4.6	9	9	654	C44UQGT6190A7SK
200	1100	85	120	126	55	2200	3.2	50	4.6	11	5	723	C44UQGT6200A8SK
250	1100	85	140	146	55	2250	3.6	60	4.1	9	5	824	C44UQGT6250A8SK
Cap Value	**VDC**	**D**	**H**	**H1**	**Ripple Current**	**Peak Current**	**ESR**	**ESL**	**Thermal Res**	**dV/dt (V/µs)**	**Pkg Qty**	**Weight**	**Part Number**

[1] *Current values that lead to a ΔT of ~85°C in the Hot Spot $T_{HS} = T_{AMB} + \Delta T = 85°C$*

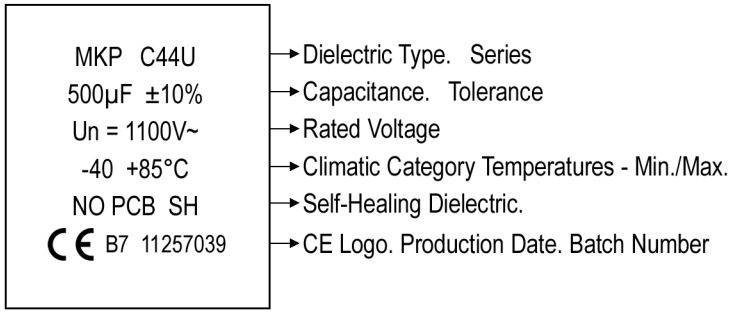
For Packaging quantities not listed, please contact KEMET.

Table 1B – Ratings & Part Number Reference

Cap Value (µF)	VDC	Maximum Dimensions (mm)			Ripple Current	Peak Current	ESR	ESL	Thermal Res	dV/dt (V/µs)	Pkg Qty	Weight (grams)	Part Number Group B Standard Duty
		D	H	H1	10 kHz 40°C (A)[1]	(A)	10 kHz (mΩ)	(nH)	(°C/W)				
600	600	85	124.5	126	83	8200	0.75	50	5.8	14	5	940	C44UHGT6600G8TK
200	900	76	95	101	45	2000	2.3	36	6.4	10	9	645	C44UOGQ6200F7SK
270	900	76	95	101	50	2700	1.8	36	6.4	10	9	610	C44UOGQ6270F7SK
370	900	85	95	101	60	3700	1.4	40	5.6	10	5	715	C44UOGQ6370F8SK
510	900	85	120	126	60	3570	1.8	40	4.6	7	5	840	C44UOGQ6510F8SK
600	900	85	140	146	58	4200	2.2	40	4.1	7	5	950	C44UOGQ6600F8SK
130	1100	76	95	101	40	1560	2.8	36	6.4	12	9	580	C44UQGQ6130F7SK
175	1100	76	95	101	46	2100	2.2	36	6.4	12	9	610	C44UQGQ6175F7SK
240	1100	85	95	101	56	2880	1.7	40	5.6	12	5	710	C44UQGQ6240F8SK
280	1100	76	140	146	43	1960	3.4	40	4.6	7	9	805	C44UQGQ6280F7SK
330	1100	85	140	146	50	2310	2.9	40	4.1	7	5	990	C44UQGQ6330F8SK
420	1100	85	155	161	60	2940	2.1	60	3.7	7	5	1120	C44UQGT6420G8SK
500	1100	85	174	180	90	6000	1.1	80	3.4	12	5	1120	C44UQGQ6500F8SK
90	1300	76	95	101	37	1350	3.3	36	6.4	15	9	580	C44UUGQ5900F7SK
120	1300	76	95	101	43	1800	2.5	36	6.4	15	9	610	C44UUGQ6120F7SK
165	1300	85	95	101	52	2475	2.0	40	5.6	15	5	716	C44UUGQ6165F8SK
195	1300	76	140	146	40	1755	4.0	50	4.6	9	9	797	C44UUGQ6195F7SK
250	1300	85	140	146	47	2250	3.3	50	4.1	9	5	957	C44UUGQ6250F8SK
320	1300	85	174	180	82	4800	1.3	80	3.4	15	5	1130	C44UUGQ6320F8SK
550	1300	85	264	270	82	4950	1.9	100	2.3	9	5	1600	C44UUGQ6550F8SK
Cap Value	**VDC**	**D**	**H**	**H1**	**Ripple Current**	**Peak Current**	**ESR**	**ESL**	**Thermal Res**	**dV/dt (V/µs)**	**Pkg Qty**	**Weight**	**Part Number**

[1] Current values that lead to a ΔT of ~70°C in the Hot Spot à $T_{HS} = T_{AMB} + \Delta T = 70°C$
For Packaging quantities not listed, please contact KEMET.

Marking



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.

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 Clorurate, CFC and HCFC and Asbestos.

Green Products

All KEMET power film products are ROHS Compliant.

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 tgδ may change up and down with increased temperature. For more information, please refer to Performance Characteristics.

Sealing

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 RI2 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.

KEMET Electronic Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

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

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

Prototype Sample Disclaimer

The Customer acknowledges the following limitations of the prototype samples:
(1) Prototype samples are manufactured from preliminary designs and manufacturing processes; may not represent final designs; have not been released for commercial use and are not subject to the same quality control procedures applicable to released products.
(2) Prototype samples are not qualified parts and are provided "as-is" by KEMET Electronics Corporation, which specifically disclaims any and all warranties and guarantees, explicit or implied, including, without limitation, the warranties of merchantability and fitness for a particular purpose or use.
(3) Prototype samples are not intended for commercial use; are provided for engineering evaluation only and are not recommended for use in the Customer's production line.
(4) The Customer assumes the risk ofany and alluses that the Customer makes of the prototype samples.

General Disclaimer

"All product specifications, statements, information and data given herein are believed to be accurate and reliable, but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on our knowledge of typical operating conditions for such applications, but are not intended to constitute – and we specifically disclaim – any warranty concerning suitability for a specific customer application or use. This Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application.

KEMET's product warranty is set forth at www.kemet.com under Terms and Conditions of Sale."

KEMET is a registered trademark of KEMET Electronics Corporation.