Printed Circuit Board Mount Power Film Capacitors

C4AU, Radial, 2 or 4 Leads, 500 - 1,200 VDC, for Harsh Environment DC Link (Automotive Grade)

Overview

The C4AU capacitor is a polypropylene metallized film capacitor with a rectangular, plastic box-type design, filled with resin, and uses 2 or 4 tinned wires. These capacitors are intended to withstand harsh environmental conditions.

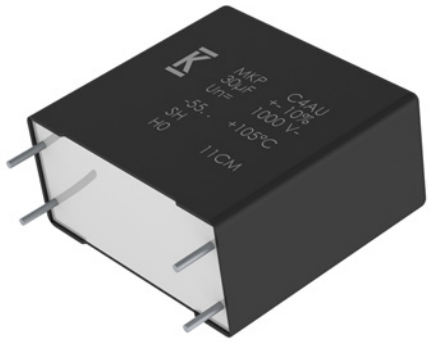
Automotive grade devices meet the demanding Automotive Electronics Council's AEC-Q200 qualification requirements.

Applications

Typical applications include DC filtering, DC link, power electronics, energy storage, renewable energy grid interface, motor drives, and automotive applications.

Benefits

- Miniaturized Sizes
- THB 85°C/85% R.H. V_R 1,000 hours
- Maximum Temperature: 125°C (passive)
- Low Halogen Content according to JS709C
- Self-healing
- Low loss
- Low ESL
- High ripple current
- High dV/dt
- High capacitance density
- High contact reliability
- Suitable for high frequency applications
- Automotive Grades (AEC-Q200)

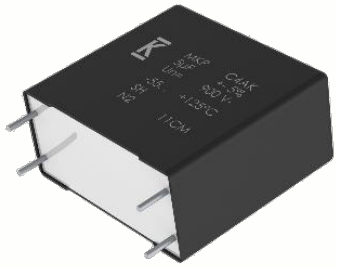


Part Number System

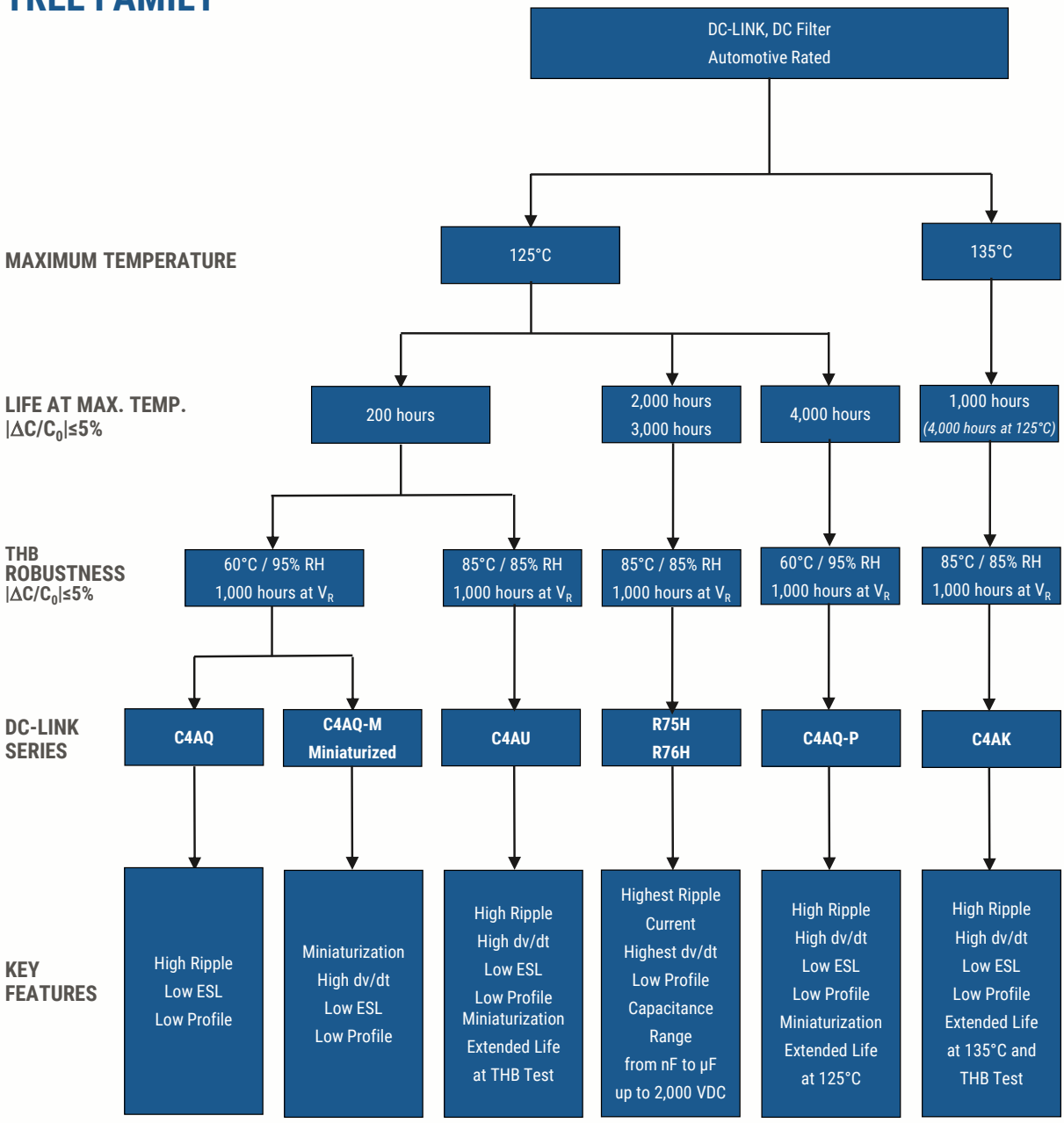
C4	A	U	P	B	W	5250	M	3	N	J
Series	Type	Application	Rated Voltage (VDC)	Case	Terminals Code	Capacitance Code (pF)	Release	Lead Diameter (mm)	Size Code: B x H x L (mm)	Tolerance
C4 = MKP power capacitors	A = Box, wire terminals	U = DC link 85/85 & Automotive Grade	L = 500 J = 700 I = 800 O = 900 N = 1000 Q = 1,100 P = 1,200	B, E = Box plastic case	U = 2 pins W = 4 pins	Digits 2 – 4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	M = Standard	1 = 0.8 2 = 1.0 3 = 1.2	See dimensions table below for valid case sizes	J = 5% K = 10%

Series Selection

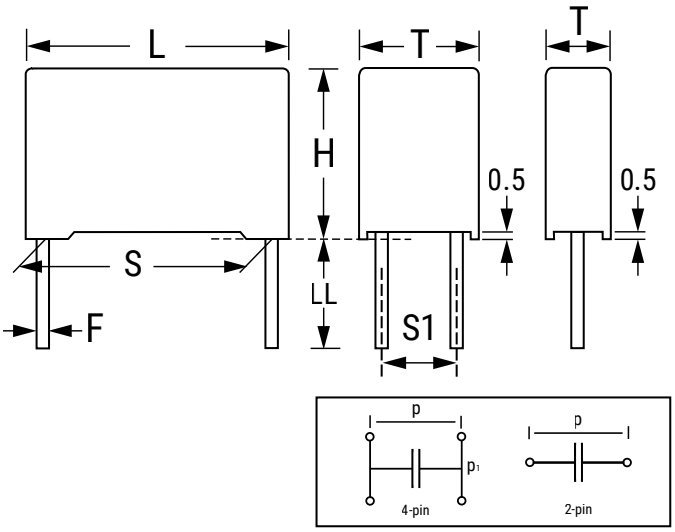
KEMET a YAGEO company



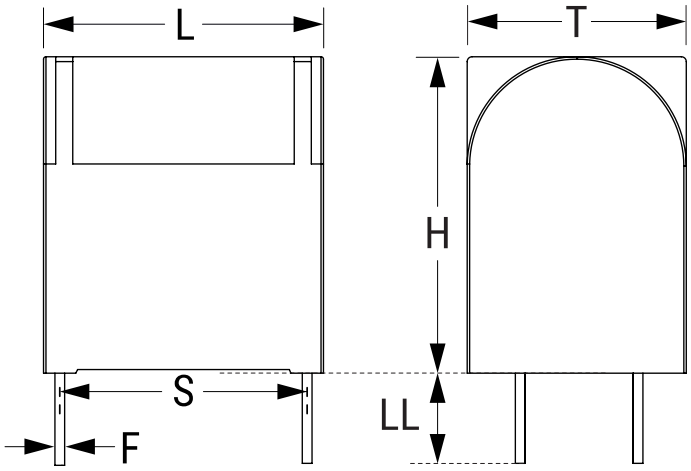
DC-LINK, DC FILTER TREE FAMILY



Dimensions – Millimeters



Box with Arc Shape Design (See Ordering Options Note):



Size Code		S		S1		T		H		L		LL		F	
Digit 6	Digit 14	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
B	W	27.5	±0.4	-	-	11.0	+0.7/-0.7	20.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	B	27.5	±0.4	-	-	13.0	+0.7/-0.7	22.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	C	27.5	±0.4	-	-	14.0	+0.7/-0.7	28.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	8	27.5	±0.4	-	-	16.0	+0.7/-0.7	30.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	1	27.5	±0.4	-	-	19.0	+0.7/-0.7	29.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	G	27.5	±0.4	-	-	22.0	+0.7/-0.7	37.0	+0.7/-0.7	32.0	+0.7/-0.7	6	+0/-2	0.8	±0.05
B	F	37.5	±0.4	10.2	±0.4	20.0	+1.0/-1.0	40.0	+1.0/-1.0	42.0	+1.0/-1.0	6	+0/-2	1.2	±0.05
B	H	37.5	±0.4	10.2	±0.4	24.0	+1.0/-1.0	44.0	+1.0/-1.0	42.0	+1.0/-1.0	6	+0/-2	1.2	±0.05
B	J	37.5	±0.4	10.2	±0.4	28.0	+1.0/-1.0	37.0	+1.0/-1.0	42.0	+1.0/-1.0	6	+0/-2	1.2	±0.05
B	L	37.5	±0.4	20.3	±0.4	30.0	+1.0/-1.0	45.0	+1.0/-1.0	42.0	+1.0/-1.0	6	+0/-2	1.2	±0.05
B	P	37.5	±0.4	20.3	±0.4	33.0	+1.0/-1.0	48.0	+1.0/-1.0	42.0	+1.0/-1.0	6	+0/-2	1.2	±0.05
B	M	52.5	±0.4	20.3	±0.4	30.0	+1.2/-1.2	45.0	+1.2/-1.2	57.5	+1.2/-1.2	6	+0/-2	1.2	±0.05
B	N	52.5	±0.4	20.3	±0.4	35.0	+1.2/-1.2	50.0	+1.2/-1.2	57.5	+1.2/-1.2	6	+0/-2	1.2	±0.05
E	A*	52.5	±0.4	20.3	±0.4	45.0	+1.2/-1.2	56.0	+1.2/-1.2	57.5	+1.2/-1.2	6	+0/-2	1.2	±0.05
E	B*	52.5	±0.4	20.3	±0.4	45.0	+1.2/-1.2	65.0	+1.2/-1.2	57.5	+1.2/-1.2	6	+0/-2	1.2	±0.05

** Box with arc shape design, available from July 31st, 2021*

Qualification

Reference Standards	IEC 61071, EN 61071, VDE0560
Climatic Category	55/105/56 according to IEC 60068–1

Automotive grade products meet or exceed the requirements outlined by the Automotive Electronics Council. Details regarding test methods and conditions are referenced in document AEC–Q200, Stress Test Qualification for Passive Components. For additional information regarding the Automotive Electronics Council and AEC–Q200, please visit their website at www.aecouncil.com.

General Technical Data

Dielectric	Polypropylene metallized film, non-inductive type, self-healing property
Application	DC filtering, DC link
Special Features	AEC–Q200 qualified
Climatic Category	55/105/56 IEC 60068-1
Temperature Range	–55°C to +105°C
Endurance Test - IEC 61071	500 hours + 500 hours at 1.3 x V_{NDC} at 85°C
Standard	IEC 61071, EN 61071, VDE0560, AEC–Q200
Protection	Solvent resistant plastic case UL 94 V–0 compliant Thermosetting resin sealing UL 94 V–0 compliant
Installation	Any position
Leads	Tinned wires, standard lead wire length 6 (+0/–2) mm
Packaging	Packed in cardboard trays with protection for the terminals
RoHS Compliance	Compliant with Directive 2002/95/EC and Directive 2011/65/EU of the European Parliament and the Council of the EU on 8 June 2011, including the Commission Delegated Directive (EU) 2015/863 that amended Annex II to Directive 2011/65/EU.

Electrical Characteristics

Rated Capacitance Range	1 – 210 µF
Rated Voltage (V_{NDC}) Range	500 – 1,200 VDC
Capacitance Tolerance	±5% (J) or ±10% (K) measured at T = +25°C ±5°C
Dissipation Factor PP Typical (tgδ0)	≤ 0.0002 at 10 kHz with T = 25°C ±5°C
Surge Voltage	1.5 * V_{NDC} for maximum 10 times in a lifetime at 25°C ±5°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} for maximum 1,000 times in a lifetime
Insulation Resistance	IR x C ≥ 30.000 seconds at 100 VDC 1 minute at T = +25°C ±5°C
Capacitance Deviation in Operation	±2.0% maximum on capacitance value measured at T = +25°C ±5°C
Temperature Storage	–40 to +80°C
Storage time	≤ 36 months from the date marked on the label glued to the package
Permissible Relative Humidity - Storage	Annual average ≤ 70%, 85% on 30 days/year randomly distributed throughout year. Dewing not admissible.

Life Expectancy

Life Expectancy	100,000 hours at V_{NDC} at hot spot temperature T_{HS} = +70°C
	20,000 hours at V_{NDC} at hot spot temperature T_{HS} = +85°C
	10,000 hours at V_{OP105} at hot spot temperature T_{HS} = +105°C
	500 hours at 0.6 x V_{OP85} at hot spot temperature T_{HS} = +115°C
	200 hours at 0.5 x V_{OP85} at hot spot temperature T_{HS} = +125°C
Capacitance Drop at End of Life	–5% (typical)
Failure Rate IEC 61709	≤ 280 FIT at V_{NDC} at hot spot temperature T_{HS} = +85°C
	≤ 130 FIT at V_{OP70} at hot spot temperature T_{HS} = +70°C

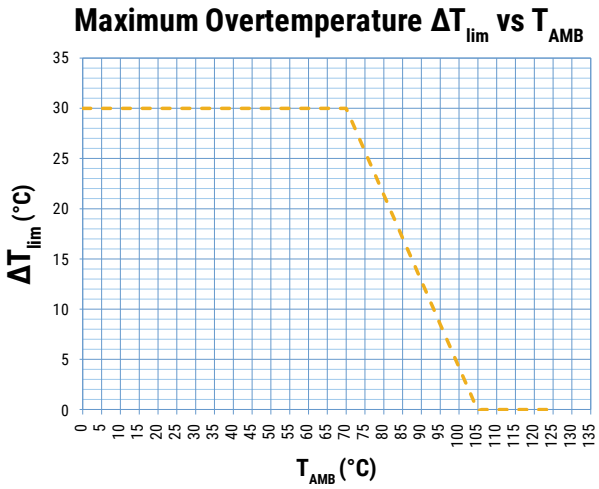
Test Method

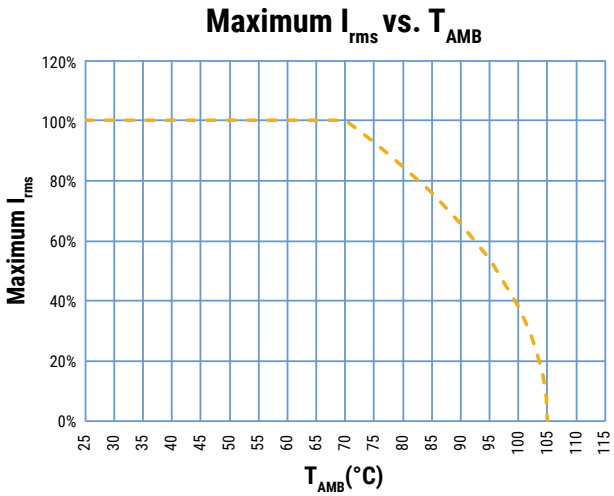
Test Voltage Between Terminals	1.5 * V_{NDC} for 10 seconds or 1.65 * V_{NDC} for 2 seconds, at T = +25°C ±5°C
Test Voltage Between Terminals and Case	3.2 k VAC 50 Hz for 2 seconds
Damp Heat	IEC 60068-2-78
Change of Temperature	IEC 60068-2-14
Biased Humidity Test 85°C/85% R.H. at V_{NDC} - 1,000 hours	$\lvert\Delta C/C_0\rvert \leq 10\%$ $\Delta DF \leq 200 \times 10^{-4}$ (at 1 kHz) IR ≥ 100 MΩ

Operative Voltage Derating

	Symbol	Voltage (VDC)						
Operating Voltage at 70°C (T_{HS})	V_{OP70}	600	800	960	1,100	1,200	1,320	1,440
Rated Voltage at 85°C (T_{HS})	V_{NDC}	500	700	800	900	1,000	1,100	1,200
Operating Voltage at 105°C (T_{HS})	V_{OP105}	350	490	560	650	700	770	850

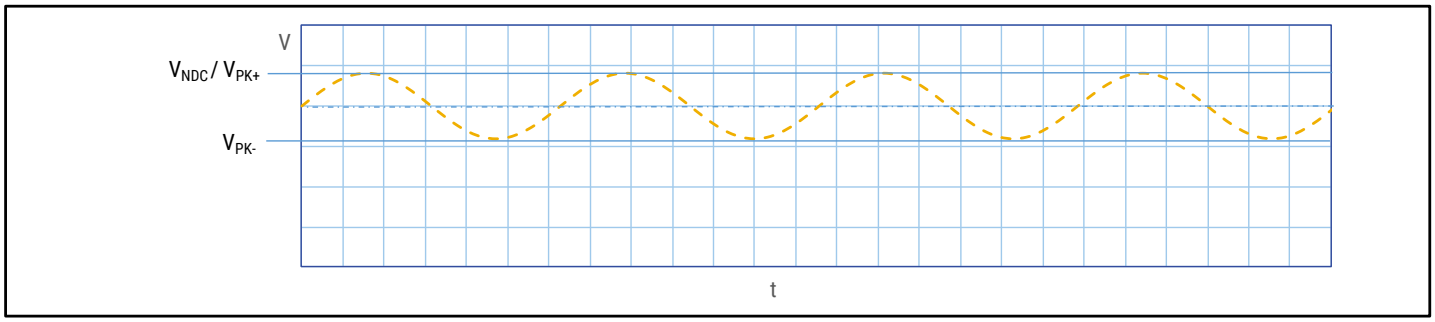
KEMET defines maximum ripple current, based on hot spot/ambient self-heating temperature. For The maximum allowed self-heating is 30°C, with ambient temperature up to 70°C. DT is reduced linearly with increasing ambient temperature, down to 0°C at 105°C:

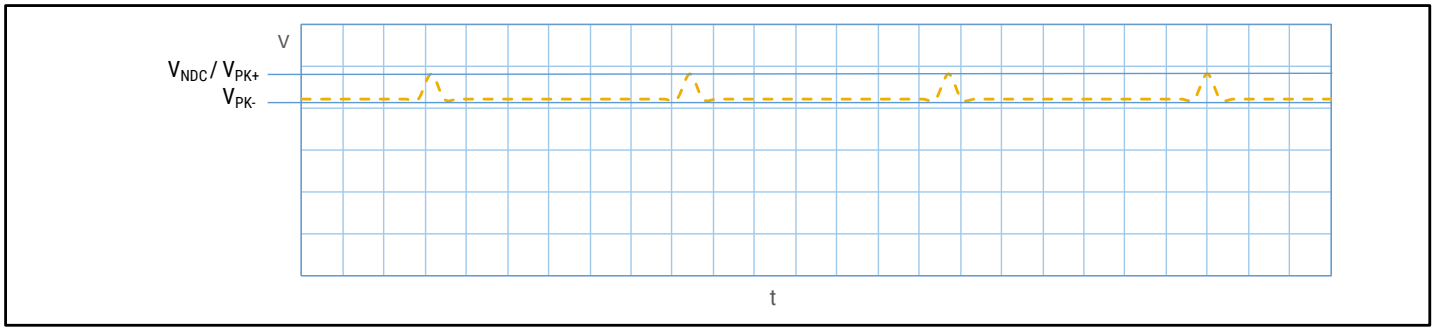


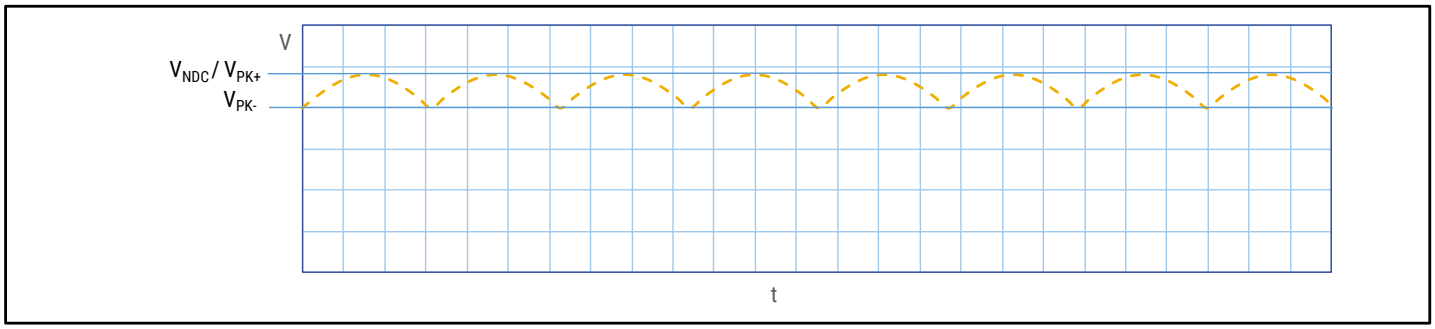


T_{AMB} is the maximum ambient temperature surrounding the capacitor or hottest contact point (e.g. tracks), whichever is higher, in the worst operation conditions in °C.

Typical Waveforms

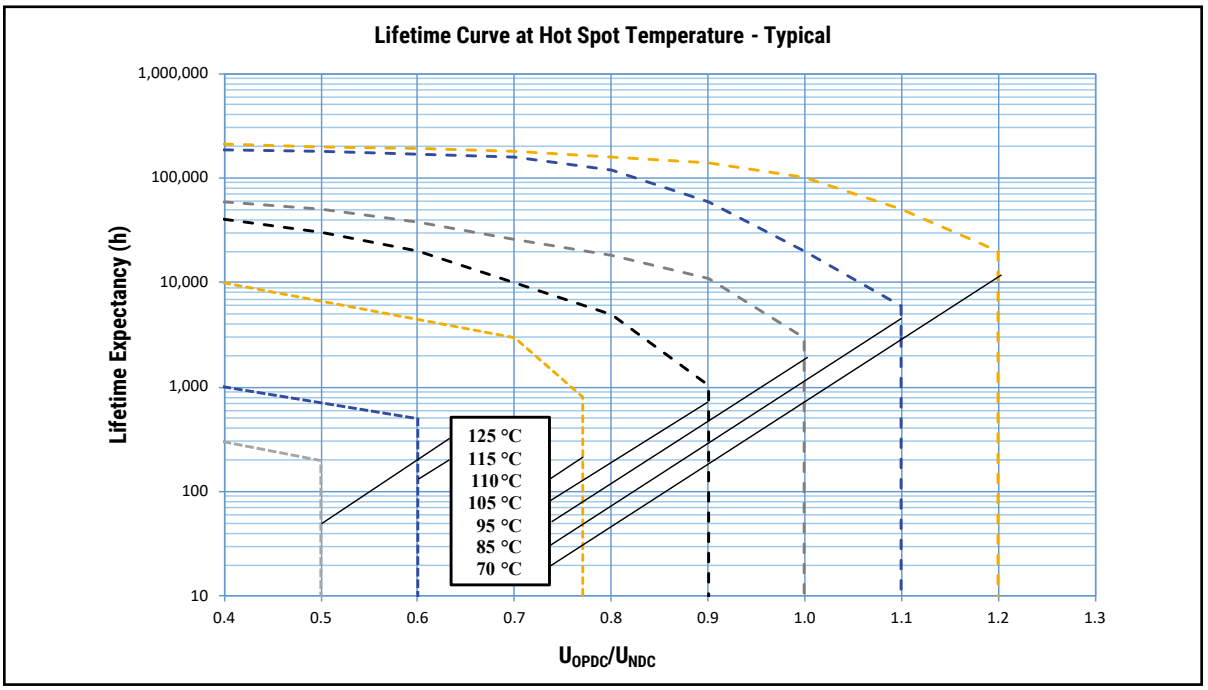




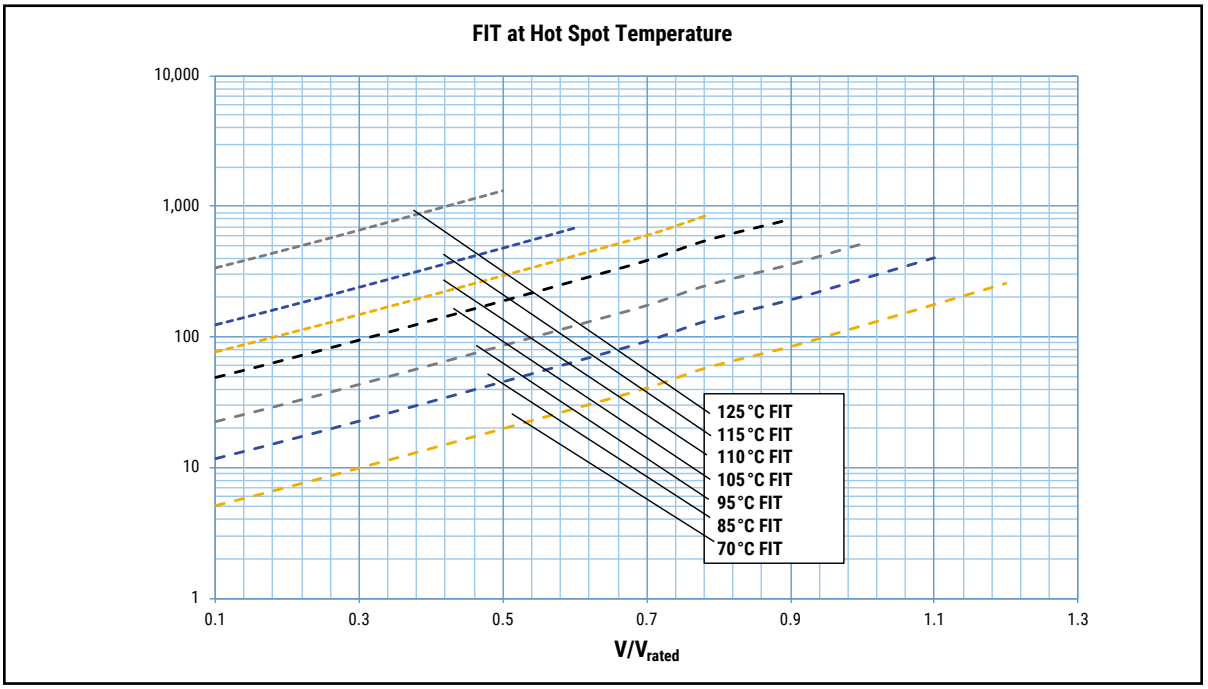


The applied peak-to-peak ripple voltage shall not exceed 0.2 x V_{NDC}.
The peak voltage shall not exceed the rated voltage V_{NDC}.

Life Expectancy/Failure Quota Graphs



Notes:
$T_{HS} = T_{AMB} + \Delta T$
$\Delta T = ESR * I_{rms}^2 * Rth$
I_{rms} should be limited to values granting $\Delta T \leq 30°C$
Confidence Level = 90%



Notes:
Failure rate I (FIT) data based on IEC 61709 standard

Environmental Compliance

As a leading global supplier of electronic components and an environmentally conscious company, KEMET continually aspires to improve the environmental effects of our manufacturing processes and our finished electronic components.

In Europe (RoHS Directive) and in some other geographical areas such as China (China RoHS), legislation has been enacted to prevent or otherwise limit the use of certain hazardous materials, including lead (Pb), in electronic equipment. KEMET monitors legislation globally to ensure compliance and endeavors to adjust our manufacturing processes and/or electronic components as may be required by applicable law.

For military, medical, automotive, and some commercial applications, the use of lead (Pb) in the termination is necessary and/or required by design. KEMET is committed to communicating RoHS compliance to our customers. Information related to RoHS compliance will be provided in data sheets and using specific identifiers on the packaging labels.

All KEMET power film capacitors are RoHS compliant.

RoHS

All Part Numbers

LH

Low Halogen

Materials & Environment

The selection of raw materials that KEMET uses for the production of its electronic components is the result of extensive experience. KEMET directs specific attention toward environmental protection. KEMET selects its suppliers according to ISO 9001 standards and performs statistical analyses on raw materials before acceptance for use in manufacturing our electronic components. All materials are, to the best of KEMET's knowledge, non-toxic and free from cadmium; mercury; chrome and compounds; polychlorine triphenyl (PCB); bromide and chlorinedioxins bromurate clorurate; CFC and HCFC; and asbestos.

Dissipation Factor

Dissipation factor is a complex function involved with capacitor inefficiency. The tgδ may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

Sealing

Hermetically Sealed Capacitors
As the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor. Such a breach can result in leakage, impregnation, filling fluid, or moisture susceptibility.

Barometric Pressure
The altitude at which hermetically sealed capacitors are operated controls the capacitor's voltage rating. 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. These effects can be in the form of capacitance changes, dielectric arc-over, and/or low insulation resistance. Altitude can also affect heat transfer. Heat that is generated in an operation cannot be dissipated properly, and high RI^2 losses and eventual failure can result.

Table 1 – Ratings & Part Number Reference

Cap Value (µF)	VDC	Dimensions (mm)					dV/dt	Ipkr	ESL	ESR 70°C at 10 kHz	I_{rms}* 70°C at 10 kHz	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
		T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{OP70} at 70°C = 600 VDC; V_{NDC} at 85°C = 500 VDC; V_{OP105} at 105°C = 350 VDC														
3.3	500	11	20	32	27.5	/	65	215	17	17.2	5.9	44	256	C4AULBU4330M1WK
4.4	500	13	22	32	27.5	/	65	286	19	13.3	7.1	39	208	C4AULBU4440M1BK
6.6	500	14	28	32	27.5	/	65	429	24	9.5	9.2	33	96	C4AULBU4660M1CK
10	500	16	30	32	27.5	/	65	650	25	7.2	11.1	29	88	C4AULBU5100M18K
11	500	19	29	32	27.5	/	65	715	25	6.3	12.0	29	72	C4AULBU5110M11K
18	500	22	37	32	27.5	/	65	1170	28	4.8	15.5	23	64	C4AULBU5180M1GK
28	500	20	40	42	37.5	10.2	30	840	12	4.5	17.1	20	58	C4AULBW5280M3FK
35	500	28	37	42	37.5	10.2	30	1050	10	3.8	19.3	18	36	C4AULBW5350M3JK
40	500	24	44	42	37.5	10.2	30	1200	13	3.2	21.8	17	44	C4AULBW5400M3HK
60	500	30	45	42	37.5	20.3	30	1800	13	2.4	27.2	15	36	C4AULBW5600M3LK
70	500	33	48	42	37.5	20.3	30	2100	14	2.1	30.6	14	30	C4AULBW5700M3PK
90	500	30	45	57.5	52.5	20.3	15	1350	13	3.2	26.1	12	27	C4AULBW5900M3MK
120	500	35	50	57.5	52.5	20.3	15	1800	15	2.5	32.2	10	23	C4AULBW6120M3NK
180	500	45	56	57.5	52.5	20.3	15	2700	17	1.7	42.6	8	18	C4AULEW6180M3AK(1)
210	500	45	65	57.5	52.5	20.3	15	3150	19	1.6	47.7	7	18	C4AULEW6210M3BK(1)
V_{OP70} at 70°C = 800 VDC; V_{NDC} at 85°C = 700 VDC; V_{OP105} at 105°C = 490 VDC														
2.4	700	11	20	32	27.5	/	65	156	17	20.3	5.4	44	256	C4AUJBU4240M1WJ
3	700	13	22	32	27.5	/	65	195	19	16.5	6.4	39	208	C4AUJBU4300M1BJ
4.8	700	14	28	32	27.5	/	65	312	24	11.0	8.6	33	96	C4AUJBU4480M1CJ
6	700	16	30	32	27.5	/	65	390	25	9.2	9.8	29	88	C4AUJBU4600M18J
8	700	19	29	32	27.5	/	65	520	25	7.3	11.3	29	72	C4AUJBU4800M11J
13	700	22	37	32	27.5	/	65	845	28	5.4	14.6	23	64	C4AUJBU5130M1GJ
20	700	20	40	42	37.5	10.2	30	600	12	5.3	15.6	20	58	C4AUJBW5200M3FJ
25	700	28	37	42	37.5	10.2	30	750	10	4.3	18.2	18	36	C4AUJBW5250M3JJ
27	700	24	44	42	37.5	10.2	30	810	13	4.0	19.4	17	44	C4AUJBW5270M3HJ
40	700	30	45	42	37.5	20.3	30	1200	13	2.8	24.9	15	36	C4AUJBW5400M3LJ
45	700	33	48	42	37.5	20.3	30	1350	14	2.5	27.6	14	30	C4AUJBW5450M3PJ
56	700	30	45	57.5	52.5	20.3	15	840	13	4.0	23.2	12	27	C4AUJBW5560M3MJ
70	700	35	50	57.5	52.5	20.3	15	1050	15	3.3	27.8	10	23	C4AUJBW5700M3NJ
100	700	45	56	57.5	52.5	20.3	15	1500	17	2.4	36.3	8	18	C4AUJEW6100M3AJ(1)
125	700	45	65	57.5	52.5	20.3	15	1875	19	2.0	42.2	7	18	C4AUJEW6125M3BJ(1)
Cap Value (µF)	V_{NDC}	T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)	Packaging Quantity	PART NUMBER
		Dimensions (mm)					dV/dt	Ipkr	ESL	ESR	I_{rms}*	Rth (HS/Amb)		

For Packaging quantites not listed, please contact KEMET.

(1): Part will be available after July 31st, 2021

(*) I_{rms} value that leads to a ΔT of ≈ 30°C in the hot spot » $T_{HS} = T_{AMB} + \Delta T$ = 70°C + 30°C = 100°C. Attention: Hot spot at 100°C reduced the life time!

Table 1 – Ratings & Part Number Reference cont.

Cap Value (µF)	VDC	Dimensions (mm)					dV/dt	Ipkr	ESL	ESR 70°C at 10 kHz	I_{rms}* 70°C at 10 kHz	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
		T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{OP70} at 70°C = 960 VDC; V_{NDC} at 85°C = 800 VDC; V_{OP105} at 105°C = 560 VDC														
1.8	800	11	20	32	27.5	/	65	117	17	23.7	5.0	44	256	C4AUIBU4180M1WJ
2.4	800	13	22	32	27.5	/	65	156	19	18.1	6.1	39	208	C4AUIBU4240M1BJ
3.6	800	14	28	32	27.5	/	65	234	24	12.7	8.0	33	96	C4AUIBU4360M1CJ
4.5	800	16	30	32	27.5	/	65	293	25	10.6	9.2	29	88	C4AUIBU4450M18J
6	800	19	29	32	27.5	/	65	390	25	8.3	10.5	29	72	C4AUIBU4600M11J
10	800	22	37	32	27.5	/	65	650	28	5.9	13.9	23	64	C4AUIBU5100M1GJ
16	800	20	40	42	37.5	10.2	30	480	12	5.9	14.9	20	58	C4AUIBW5160M3FJ
20	800	28	37	42	37.5	10.2	30	600	10	4.7	17.4	18	36	C4AUIBW5200M3JK
20	800	24	44	42	37.5	10.2	30	600	13	4.7	17.9	17	44	C4AUIBW5200M3HJ
30	800	30	45	42	37.5	20.3	30	900	13	3.2	23.2	15	36	C4AUIBW5300M3LJ
35	800	33	48	42	37.5	20.3	30	1050	14	2.8	26.1	14	30	C4AUIBW5350M3PJ
45	800	30	45	57.5	52.5	20.3	15	675	13	4.4	22.3	12	27	C4AUIBW5450M3MJ
55	800	35	50	57.5	52.5	20.3	15	825	15	3.6	26.4	10	23	C4AUIBW5550M3NJ
80	800	45	56	57.5	52.5	20.3	15	1200	17	2.6	34.9	8	18	C4AUIEW5800M3AJ(1)
100	800	45	65	57.5	52.5	20.3	15	1500	19	2.2	40.6	7	18	C4AUIEW6100M3BJ(1)
V_{OP70} at 70°C = 1,100 VDC; V_{NDC} at 85°C = 900 VDC; V_{OP105} at 105°C = 650 VDC														
1.5	900	11	20	32	27.5	/	70	105	17	25.4	4.8	44	256	C4AUOBU4150M1WJ
2	900	13	22	32	27.5	/	70	140	19	19.4	5.9	39	208	C4AUOBU4200M1BK
3	900	14	28	32	27.5	/	70	210	24	13.6	7.7	33	96	C4AUOBU4300M1CJ
3.6	900	16	30	32	27.5	/	70	252	25	11.7	8.7	29	88	C4AUOBU4360M18J
5	900	19	29	32	27.5	/	70	350	25	8.8	10.2	29	72	C4AUOBU4500M11J
8	900	22	37	32	27.5	/	70	560	28	6.4	13.4	23	64	C4AUOBU4800M1GJ
12.5	900	20	40	42	37.5	10.2	35	438	12	6.7	14.0	20	58	C4AUOBW5125M3FJ
15	900	28	37	42	37.5	10.2	35	525	10	5.6	16.0	18	36	C4AUOBW5150M3JJ
16	900	24	44	42	37.5	10.2	35	560	13	5.3	17.0	17	44	C4AUOBW5160M3HJ
24	900	30	45	42	37.5	20.3	35	840	13	3.6	22.0	15	36	C4AUOBW5240M3LJ
27	900	33	48	42	37.5	20.3	35	945	14	3.2	24.4	14	30	C4AUOBW5270M3PJ
35	900	30	45	57.5	52.5	20.3	15	525	13	5.0	20.9	12	27	C4AUOBW5350M3MJ
45	900	35	50	57.5	52.5	20.3	15	675	15	3.9	25.4	10	23	C4AUOBW5450M3NJ
65	900	45	56	57.5	52.5	20.3	15	975	17	2.8	33.5	8	18	C4AUOEW5650M3AJ(1)
80	900	45	65	57.5	52.5	20.3	15	1200	19	2.4	38.7	7	18	C4AUOEW5800M3BJ(1)
Cap Value (µF)	V_{NDC}	T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)	Packaging Quantity	PART NUMBER
		Dimensions (mm)					dV/dt	Ipkr	ESL	ESR	I_{rms}*	Rth (HS/Amb)		

For Packaging quantites not listed, please contact KEMET.

(1): Part will be available after July 31st, 2021

(*) I_{rms} value that leads to a ΔT of ≈ 30°C in the hot spot » $T_{HS} = T_{AMB} + \Delta T = 70°C + 30°C = 100°C$. Attention: Hot spot at 100°C reduced the life time!

Table 1 – Ratings & Part Number Reference cont.

Cap Value (µF)	VDC	Dimensions (mm)					dV/dt	Ipkr	ESL	ESR 70°C at 10 kHz	I_{rms}* 70°C at 10 kHz	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
		T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{OP70} at 70°C = 1,200 VDC; V_{NDC} at 85°C = 1,000 VDC; V_{OP105} at 105°C = 700 VDC														
1.2	1,000	11	20	32	27.5	/	75	90	17	28.7	4.6	44	256	C4AUNBU4120M1WJ
1.5	1,000	13	22	32	27.5	/	75	113	19	23.3	5.4	39	208	C4AUNBU4150M1BJ
2.4	1,000	14	28	32	27.5	/	75	180	24	15.3	7.3	33	96	C4AUNBU4240M1CJ
3	1,000	16	30	32	27.5	/	75	225	25	12.6	8.4	29	88	C4AUNBU4300M18J
4	1,000	19	29	32	27.5	/	75	300	25	9.8	9.7	29	72	C4AUNBU4400M11J
6.6	1,000	22	37	32	27.5	/	75	495	28	6.9	12.9	23	64	C4AUNBU4660M1GJ
10	1,000	20	40	42	37.5	10.2	37	370	12	7.5	13.2	20	58	C4AUNBW5100M3FJ
12	1,000	28	37	42	37.5	10.2	37	444	10	6.3	15.1	18	36	C4AUNBW5120M3JJ
13	1,000	24	44	42	37.5	10.2	37	481	13	5.8	16.1	17	44	C4AUNBW5130M3HJ
18	1,000	30	45	42	37.5	20.3	37	666	13	4.3	20.2	15	36	C4AUNBW5180M3LJ
22	1,000	33	48	42	37.5	20.3	37	814	14	3.6	23.3	14	30	C4AUNBW5220M3PJ
27	1,000	30	45	57.5	52.5	20.3	17	459	13	5.7	19.4	12	27	C4AUNBW5270M3MJ
36	1,000	35	50	57.5	52.5	20.3	17	612	15	4.4	24.0	10	23	C4AUNBW5360M3NJ
50	1,000	45	56	57.5	52.5	20.3	17	850	17	3.3	31.2	8	18	C4AUNEW5500M3AJ(1)
65	1,000	45	65	57.5	52.5	20.3	17	1105	19	2.6	37.0	7	18	C4AUNEW5650M3BJ(1)
V_{OP70} at 70°C = 1,320 VDC; V_{NDC} at 85°C = 1,100 VDC; V_{OP105} at 105°C = 770 VDC														
1	1,100	11	20	32	27.5	/	80	80	17	31.6	4.3	44	256	C4AUQBU4100M1WJ
1.2	1,100	13	22	32	27.5	/	80	96	19	26.6	5.0	39	208	C4AUQBU4120M1BJ
2	1,100	14	28	32	27.5	/	80	160	24	16.7	7.0	33	96	C4AUQBU4200M1CJ
2.4	1,100	16	30	32	27.5	/	80	192	25	14.2	7.9	29	88	C4AUQBU4240M18J
3.3	1,100	19	29	32	27.5	/	80	264	25	10.7	9.3	29	72	C4AUQBU4330M11J
5	1,100	22	37	32	27.5	/	80	400	28	7.9	12.0	23	64	C4AUQBU4500M1GJ
8	1,100	20	40	42	37.5	10.2	40	320	12	8.5	12.4	20	58	C4AUQBW4800M3FJ
10	1,100	28	37	42	37.5	10.2	40	400	10	6.9	14.4	18	36	C4AUQBW5100M3JJ
10	1,100	24	44	42	37.5	10.2	40	400	13	6.9	14.9	17	44	C4AUQBW5100M3HJ
15	1,100	30	45	42	37.5	20.3	40	600	13	4.7	19.3	15	36	C4AUQBW5150M3LJ
18	1,100	33	48	42	37.5	20.3	40	720	14	3.9	22.1	14	30	C4AUQBW5180M3PJ
23	1,100	30	45	57.5	52.5	20.3	20	460	13	6.1	18.8	12	27	C4AUQBW5230M3MJ
30	1,100	35	50	57.5	52.5	20.3	20	600	15	4.8	23.0	10	23	C4AUQBW5300M3NJ
44	1,100	45	56	57.5	52.5	20.3	20	880	17	3.4	30.7	8	18	C4AUQEW5440M3AJ(1)
50	1,100	45	65	57.5	52.5	20.3	20	1000	19	3.0	34.3	7	18	C4AUQEW5500M3BJ(1)
Cap Value (µF)	V_{NDC}	T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)	Packaging Quantity	PART NUMBER
		Dimensions (mm)					dV/dt	Ipkr	ESL	ESR	I_{rms}*	Rth (HS/Amb)		

For Packaging quantites not listed, please contact KEMET.
(1): Part will be available after July 31st, 2021
(*) I_{rms} value that leads to a ΔT of ≈ 30°C in the hot spot » $T_{HS} = T_{AMB} + \Delta T$ = 70°C + 30°C = 100°C. Attention: Hot spot at 100°C reduced the life time!

Table 1 – Ratings & Part Number Reference cont.

Cap Value (µF)	VDC	Dimensions (mm)					dV/dt	Ipkr	ESL	ESR 70°C at 10 kHz	I_{rms}* 70°C at 10 kHz	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
		T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{OP70} at 70°C = 1,440 VDC; V_{NDC} at 85°C = 1,200 VDC; V_{OP105} at 105°C = 850 VDC														
1	1,200	13	22	32	27.5	/	90	90	19	28.4	4.9	39	208	C4AUPBU4100M1BJ
1.5	1,200	14	28	32	27.5	/	90	135	24	19.6	6.4	33	96	C4AUPBU4150M1CJ
2	1,200	16	30	32	27.5	/	90	180	25	15.1	7.7	29	88	C4AUPBU4200M18J
2.5	1,200	19	29	32	27.5	/	90	225	25	12.4	8.6	29	72	C4AUPBU4250M11J
4.4	1,200	22	37	32	27.5	/	90	396	28	8.0	11.9	23	64	C4AUPBU4440M1GJ
7	1,200	20	40	42	37.5	10.2	45	315	12	8.7	12.2	20	58	C4AUPBW4700M3FJ
8	1,200	28	37	42	37.5	10.2	45	360	10	7.6	13.7	18	36	C4AUPBW4800M3JJ
8.8	1,200	24	44	42	37.5	10.2	45	396	13	7.0	14.7	17	44	C4AUPBW4880M3HJ
13	1,200	30	45	42	37.5	20.3	45	585	13	4.8	19.0	15	36	C4AUPBW5130M3LJ
15	1,200	33	48	42	37.5	20.3	45	675	14	4.2	21.4	14	30	C4AUPBW5150M3PJ
20	1,200	30	45	57.5	52.5	20.3	23	460	13	6.3	18.5	12	27	C4AUPBW5200M3MK
25	1,200	35	50	57.5	52.5	20.3	23	575	15	5.1	22.2	10	23	C4AUPBW5250M3NJ
35	1,200	45	56	57.5	52.5	20.3	23	805	17	3.8	29.0	8	18	C4AUPEW5350M3AJ(1)
44	1,200	45	65	57.5	52.5	20.3	23	1012	19	3.1	34.0	7	18	C4AUPEW5440M3BJ(1)
Cap Value (µF)	V_{NDC}	T	H	L	S	S1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)	Packaging Quantity	PART NUMBER
		Dimensions (mm)					dV/dt	Ipkr	ESL	ESR	I_{rms}*	Rth (HS/Amb)		

For Packaging quantites not listed, please contact KEMET.
(1): Part will be available after July 31st, 2021
(*) I_{rms} value that leads to a ΔT of ≈ 30°C in the hot spot » $T_{HS} = T_{AMB} + \Delta T = 70°C + 30°C = 100°C$. Attention: Hot spot at 100°C reduced the life time!

Soldering Process

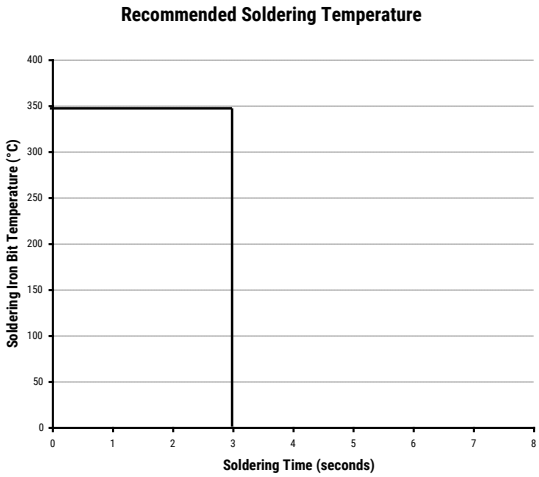
The implementation of the RoHS directive has resulted in the selection of SnAuCu (SAC) alloys, or SnCu alloys, as the primary solder material. This has increased the liquidus temperature from 183°C for a SnPb eutectic alloy to 217 – 221°C for new alloys. As a result, the heat stress to the components, even in wave soldering, has increased considerably due to higher pre-heat and wave temperatures. Polypropylene capacitors are especially sensitive to heat (the melting point of polypropylene is 160 – 170°C). Wave soldering can be destructive, especially for mechanically small polypropylene capacitors (with lead spacing of 5 – 15 mm), and great care must be taken during soldering. The recommended solder profiles from KEMET should be used. Contact KEMET with any questions. In general, the wave soldering curve from IEC Publication 61760–1 Edition 2 serves as a solid guideline for successful soldering. See Figure 1.

Reflow soldering is not recommended for through-hole film capacitors. Exposing capacitors to a soldering profile in excess of the recommended limits may result in degradation or permanent damage to the capacitors.

Do not place the polypropylene capacitor through an adhesive curing oven to cure resin for surface mount components. Insert through-hole parts after curing the surface mount parts. Contact KEMET to discuss the actual temperature profile in the oven, if through-hole components must pass through the adhesive curing process. A maximum two soldering cycles is recommended. Allow time for the capacitor surface temperature to return to normal before the second soldering cycle.

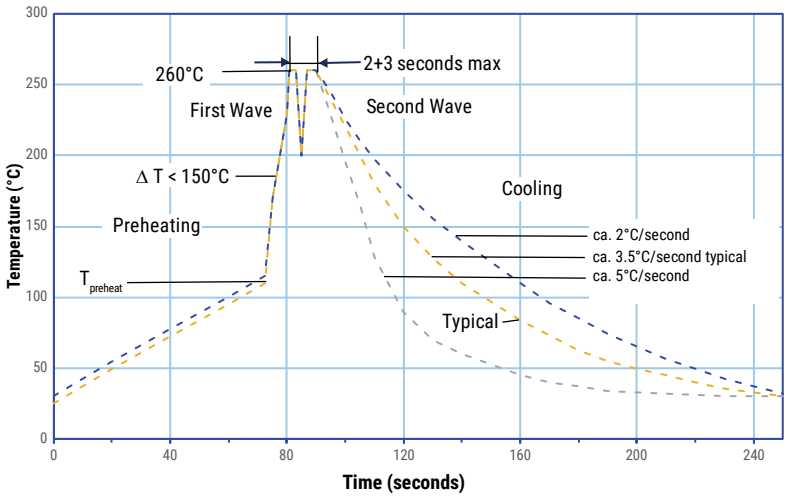
Manual Soldering Recommendations

Following is the recommendation for manual soldering with a soldering iron.



The soldering iron tip temperature should be set at 350°C (+10°C) maximum with the soldering duration not to exceed more than 3 seconds.

Wave Soldering Recommendations



Soldering Process cont.

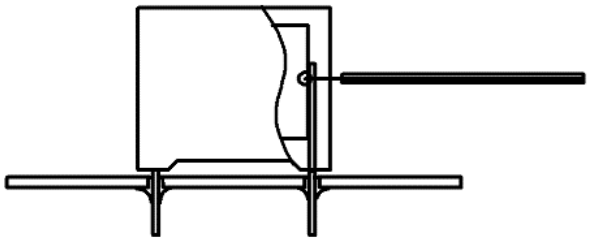
Wave Soldering Recommendations cont.

1. The tables indicates the maximum set-up temperature of the soldering process

Dielectric Film Material	Maximum Preheat Temperature		Maximum Peak Soldering Temperature	
	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm
Polyester	130°C	130°C	270°C	270°C
Polypropylene	110°C	130°C	260°C	270°C
Paper	130°C	140°C	270°C	270°C
Polyphenylene Sulphide	150°C	160°C	270°C	270°C

2. The maximum temperature measured inside the capacitor: set the temperature so that inside the element the maximum temperature is below the limit.

Dielectric Film Material	Maximum Temperature Measured Inside the Element
Polyester	160°C
Polypropylene	110°C
Paper	160°C
Polyphenylene Sulphide	160°C



Temperature monitored inside the capacitor.

Selective Soldering Recommendations

Selective dip soldering is a variation of reflow soldering. In this method, the printed circuit board with through-hole components to be soldered is pre-heated and transported over the solder bath, as in normal flow soldering, without touching the solder. When the board is over the bath, it is stopped. Pre-designed solder pots are lifted from the bath with molten solder, only at the places of the selected components, and pressed against the lower surface of the board to solder the components.

The temperature profile for selective soldering is similar to the double wave flow soldering outlined in this document. However, instead of two baths, there is only one with a time from 3 – 10 seconds. In selective soldering, the risk of overheating is greater than in double wave flow soldering, and great care must be taken so that the parts do not overheat.

Mounting

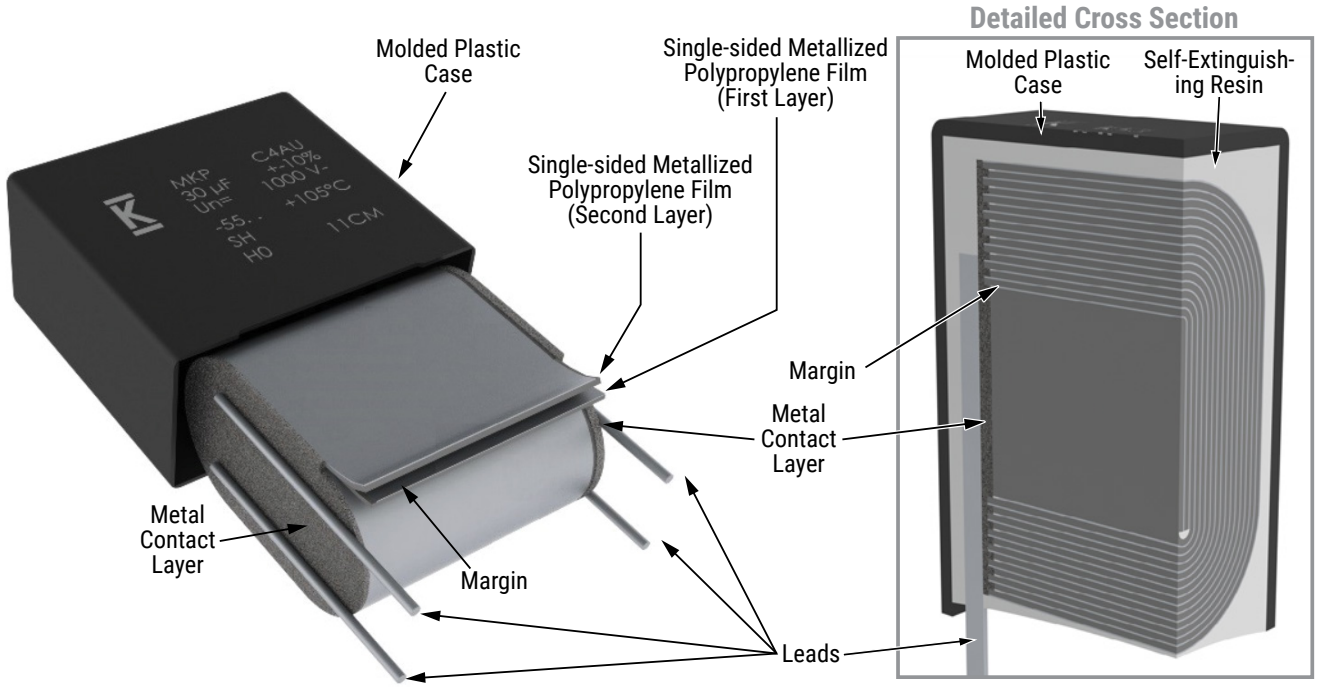
Resistance to Vibration and Mechanical Shock

AEC-Q200 Mechanical Stress Tests:

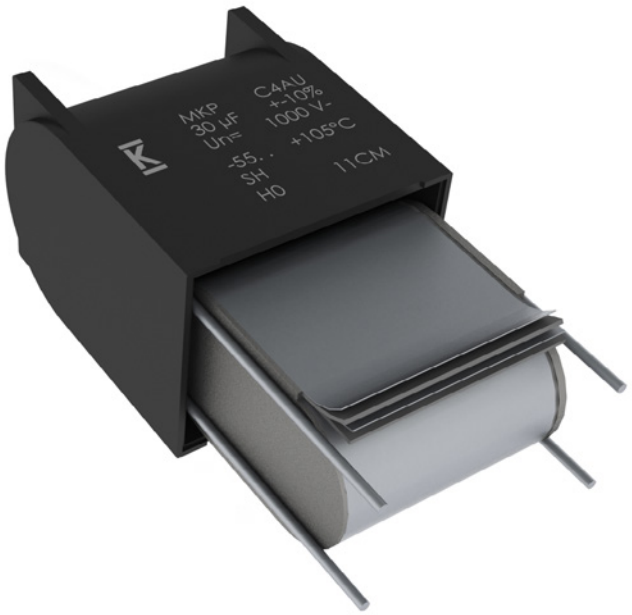
Mechanical Shock	**MIL-SDT-202 Method 213**	Test condition C Peak value 100 g, duration 6 ms, half-sine-wave (see MIL-HDBK for details)
Vibration	**MIL-SDT-202 Method 204**	5 g for 20 minutes, 12 cycles each of 3 orientations Use 8"X5" PCB, .031" thick. 7 secure points on one 8" side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10 – 2,000 Hz.

The capacitors are designed for PCB mounting.
The stand-off pipes must be in good contact with the printed circuit board.
The capacitor body has to be properly fixed (e.g. clamped or glued).

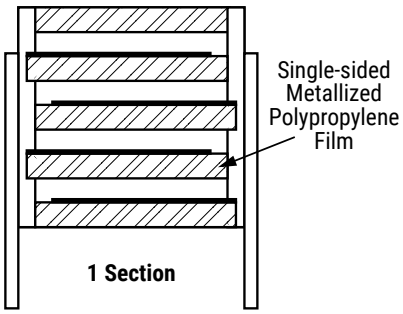
Construction



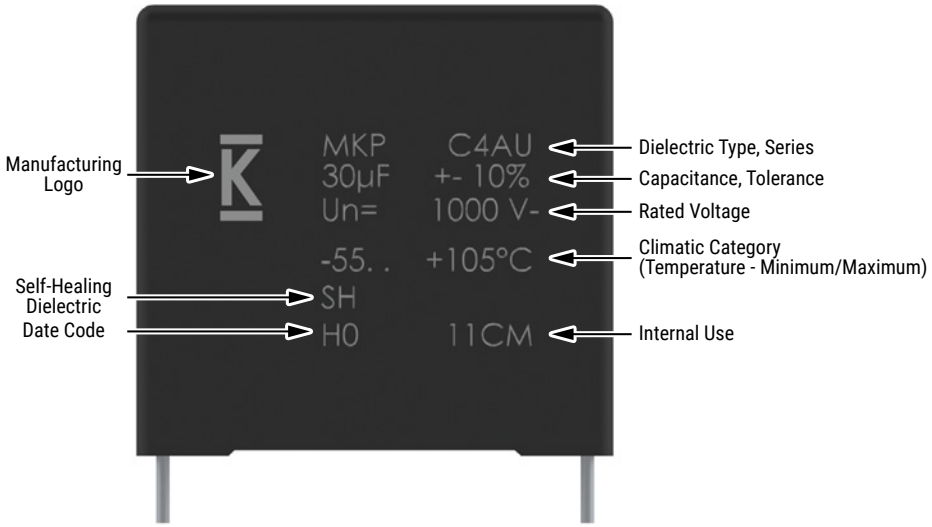
Construction cont.



Winding Scheme



Marking



Manufacturing Date Code (IEC–60062)									
Year	Code	Year	Code	Year	Code	Month	Code	Month	Code
2010	A	2017	J	2024	S	January	1	July	7
2011	B	2018	K	2025	T	February	2	August	8
2012	C	2019	L	2026	U	March	3	September	9
2013	D	2020	M	2027	V	April	4	October	O
2014	E	2021	N	2028	W	May	5	November	N
2015	F	2022	P	2029	X	June	6	December	D
2016	H	2023	R	2030	A				

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