Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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C4AF, Radial, 2 or 4 Leads, 250 – 400 VAC, for Harsh Environment AC Filtering (Automotive Grade)

Electronic Components KEMET CHARGED®

Overview

C4AF are polypropylene metallized film capacitors that are rectangular shape, with a plastic box-type design (white or grey in color), filled with resin and have 2 or 4 tinned copper wires. These capacitors are intended to withstand harsh environmental conditions.

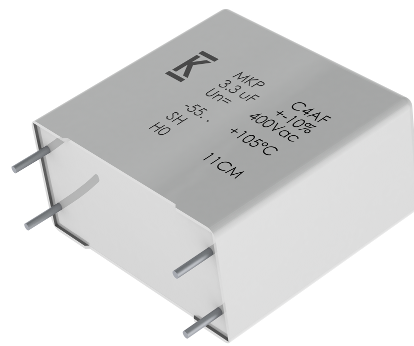
Automotive grade devices meet the demanding Automotive Electronics Council's AEC–Q200 qualification requirements.

Applications

Typical applications include clamping, AC and harmonic filtering in UPS systems, motor drives, renewable energy, and automotive systems.

Benefits

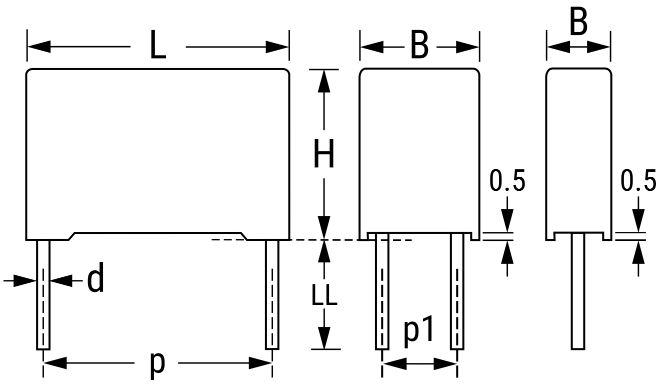
- Self-healing
- Low losses
- High ripple current
- High contact reliability
- Optimized AC voltage performance
- Suitable for high frequency applications
- Able to withstand harsh environmental conditions
- Automotive grades (AEC–Q200)

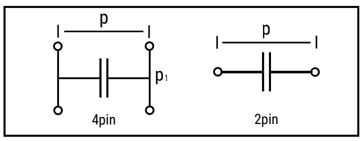


Part Number System

C4	A	F	1	B	W	5330	A	3	N	J
Series	Type	Application	Rated Voltage (VAC)	Case	Terminals Code	Capacitance Code (pF)	C-Spec	Lead Diameter (mm)	Size Code: B x H x L (mm)	Tolerance
C4 = MKP Power Capacitors	A = Box, wire terminals	F = AC filtering	1 = 250 9 = 310 7 = 350 3 = 400	B = Box plastic case E = Box plastic case, extended (> 35 x 50 x 57.5)	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.	A = Standard Grade	1 = 0.8 3 = 1.2	Digit 6 = B W = 11 x 20 x 31.5 X = 13 x 25 x 31.5 Y = 14 x 28 x 31.5 1 = 19 x 29 x 31.5 2 = 22 x 37 x 31.5 F = 20 x 40 x 42 J = 28 x 37 x 42 L = 30 x 45 x 42 M = 3 0 x 45 x 57.5 N = 35 x 50 x 57.5 Digit 6 = E A = 45 x 56 x 57.5 B = 45 x 65 x 57.5	J = 5% K = 10%

Dimensions – Millimeters





Size Code		p		p1		B		H		L		LL		d	
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	+0.3	20.0	+0.2	31.5	+0.5	6	+0/−2	0.8	±0.05
B	X	27.5	±0.4	-	-	13.0	+0.3	25.0	+0.2	31.5	+0.5	6	+0/−2	0.8	±0.05
B	Y	27.5	±0.4	-	-	14.0	+0.3	28.0	+0.2	31.5	+0.5	6	+0/−2	0.8	±0.05
B	1	27.5	±0.4	-	-	19.0	+0.3	29.0	+0.2	31.5	+0.5	6	+0/−2	0.8	±0.05
B	2	27.5	±0.4	-	-	22.0	+0.3	37.0	+0.2	31.5	+0.5	6	+0/−2	0.8	±0.05
B	F	37.5	±0.4	5.1/10.2	±0.4	20.0	+0.4	40.0	+0.2	42.0	+0.6	6	+0/−2	1.2	±0.05
B	J	37.5	±0.4	10.2	±0.4	28.0	+0.4	37.0	+0.2	42.0	+0.6	6	+0/−2	1.2	±0.05
B	L	37.5	±0.4	20.3	±0.4	30.0	+0.4	45.0	+0.2	42.0	+0.6	6	+0/−2	1.2	±0.05
B	O	37.5	±0.4	20.3	±0.4	35.0	+0.4	50.0	+0.2	42.0	+0.6	6	+0/−2	1.2	±0.05
B	M	52.5	±0.4	20.3	±0.4	30.0	+0.5	45.0	+0.3	57.5	+0.8	6	+0/−2	1.2	±0.05
B	N	52.5	±0.4	20.3	±0.4	35.0	+0.5	50.0	+0.3	57.5	+0.8	6	+0/−2	1.2	±0.05
E	A	52.5	±0.4	20.3	±0.4	45.0	+0.5	56.0	+0.3	57.5	+0.8	6	+0/−2	1.2	±0.05
E	B	52.5	±0.4	20.3	±0.4	45.0	+0.5	65.0	+0.3	57.5	+0.8	6	+0/−2	1.2	±0.05

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	AC Filtering (250 VAC, 310 VAC, 350 VAC, 400 VAC) 250 VAC rating reccomended ONLY for controlled output filtering
Special Features	AEC-Q200 qualified
Climatic Category	55/105/56 IEC 60068-1
Maximum Operating Temperature	105 °C
Lower Operating Temperature	−55°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 copper wires - standard lead wire length 6 (+0/−2) mm
Packaging	Packed in cardboard trays with protection for the terminals
RoHS Compliance	Compliant with the restricted substance requirements of Directive 2011/65/EU

Electrical Characteristics

Rated Capacitance Range	1 to 62 µF
Rated Voltage (VNAC) Range	250 to 400 VAC (50/60 Hz)
Capacitance Tolerance	±5% (J) or ±10% (K) measured at T = +25°C ±5°C
Dissipation Factor PP Maximum (tgδ0)	≤ 0.0007 with T = 25°C ±5°C
Surge Voltage	1.5 * V_{NDC} for maximum 10 times in lifetime at T = 25°C ±5°C
Overvoltage (IEC 61071)	1.15 * V_{NDC} for maxijmum 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 lifetime
Insulation Resistance	IR x C ≥ 30,000 seconds at 100 VDC 1 minute at T = +25°C, ±5°C
Capacitance Deviation in the operating temperature range −55 to 105°C	±2.5% 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	≥ 60,000 hours at V_{NAC} and T_{HS} = +85°C
Capacitance Drop at End of Life	−5% (typical)
Failure Rate	See Life Expectancy/Failure Quota Graphs

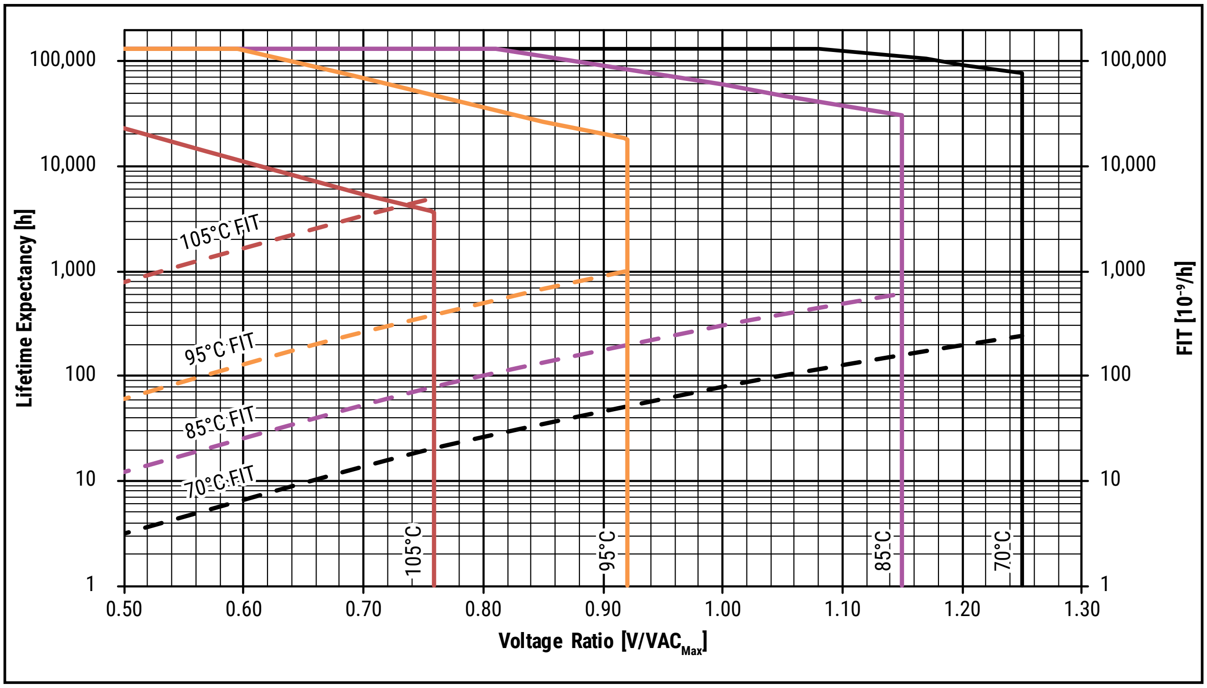
Test Method

Peak Non-Repetitive Maximum Current	I_{PKR} x 1.5
Test Voltage Terminal to Terminal V_{TT}	1.5 * V_{NDC} for 10 seconds
Test Voltage Terminal to Case V_{TC}	2 k VAC – 50/60 Hz for 60 seconds
Endurance Test	500 hours + 500 hours at 1.25 x rated voltage at 85°C
	500 hours + 500 hours at 1.25 x operative voltage t 105°C
Damp Heat	IEC 60068-2-78
THB Test 85/85 with Voltage	250 and 310 V_{NAC} version:
	240 VAC, 85°C/85% R.H. 500 hours: ΔC/C | < 10% and |ΔTg| < 3*10^{-3} at 1 kHz IR ≥ 50% initial limit
	350 and 400 V_{NAC} version:
	310 VAC, 85°C/85% R.H. 500 hours: ΔC/C | < 10% and |ΔTg| < 3*10^{-3} at 1 kHz IR ≥ 50% initial limit
Change of Temperature	IEC 60068–2–14

Operative Voltage Derating

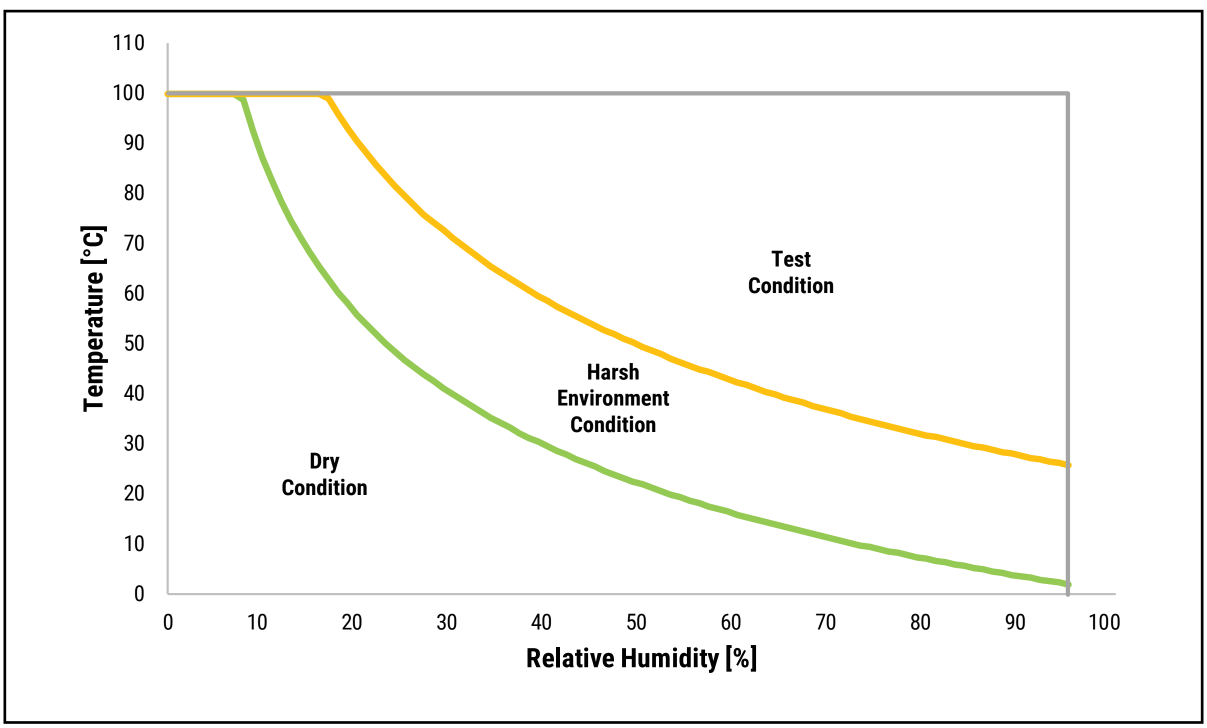
	Voltage (VAC)			
Operating Voltage	250	310	350	400
Rated Voltage at 85°C (T_{HS})	250	310	350	400
Operating Voltage at 105°C (T_{HS})	175	217	245	280

Life Expectancy/Failure Quota* Graphs



** Evaluated considering an environmental conditions as dry condition.*

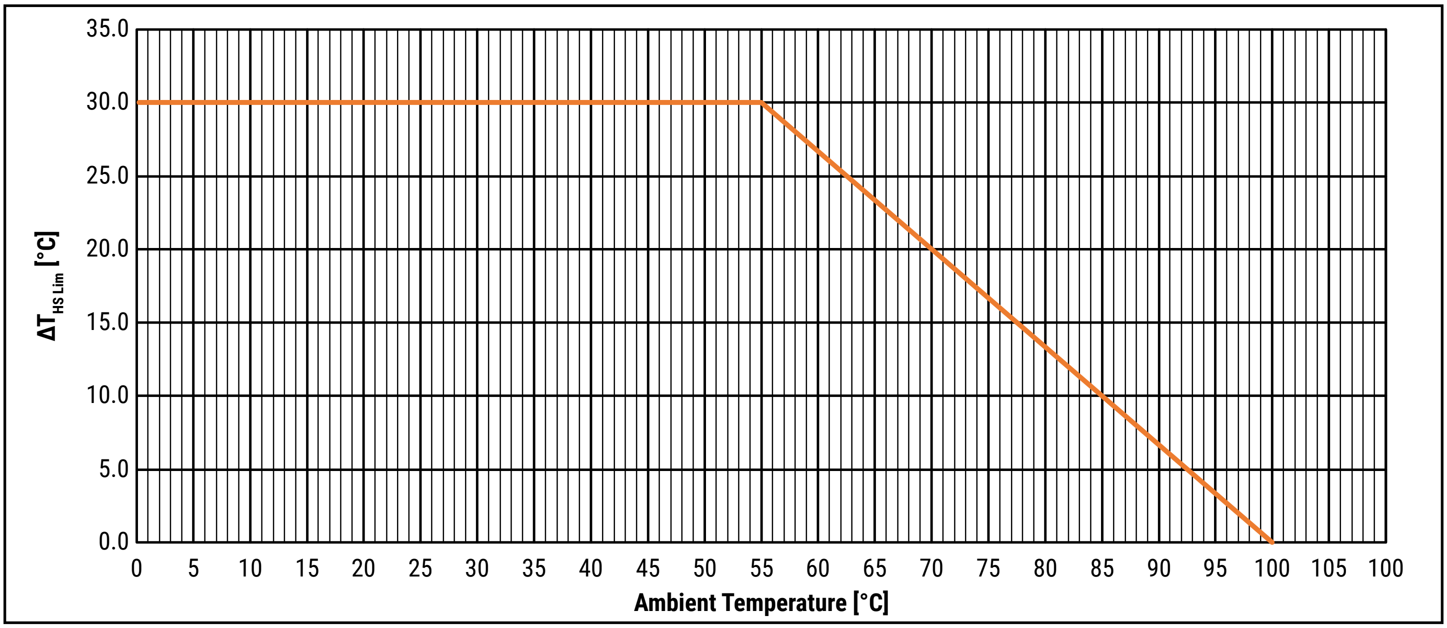
Environmental condition reference



Life Expectancy/Failure Quota Graphs cont.

KEMET defines maximum ripple current, based on hot spot/ambient self-heating temperature. For C4AF, maximum allowed self-heating is 30°C, with ambient temperature up to 55°C. DT is reduced linearly with increasing ambient temperature, down to 0°C at 100°C (no self-heating allowed at maximum operating temperature):

$\Delta T_{HS\ Lim}$ vs. Ambient Temperature



Power Losses & Hot Spot Temperature Calculation

At each frequency, the power lossess are the sum of:

1. Dielectric power losses

$$P_D(f_i) = 2 * \pi * f_i * C * V(f_i)^2 * tg\delta_0$$

which can be alternatively calculated as

$$P_D(f_i) = \frac{I(f_i)^2}{2 * \pi * f_i * C} * tg\delta_0$$

where:

$$tgd_0 = 7 * 10^{-4} \text{ (maximum value)}$$

2. Joule power losses

$$P_J(f_i) = Rs * I(f_i)^2$$

The total power losses are the sum of the components at each frequency:

$$P_T = \Sigma_i [P_D(f_i) + P_J(f_i)]$$

The thermal jump in the hot spot is:

$$\Delta T_{HS} = P_T * R_{th}$$

The hot spot temperature is:

$$T_{HS} = T_a + \Delta T_{HS}$$

Power Losses & Hot Spot Temperature Calculation cont.

Limits for the formulas

The limits listed below should not be exceeded:

$$1. \quad \sqrt{\sum_i V(f_i)^2} \leq VAC_{MAX}$$

$$2. \quad \sqrt{\sum_i I(f_i)^2} \leq I_{RMS_{MAX}}$$

$$T_{HS} = T_a + \Delta T_{HS} \leq (T_{HS})_{MAX}$$

where Ta is the ambient temperature (steady state temperature of the cooling air flowing around the capacitor, measured at 100 mm of distance from the capacitor and at a height of 2/3 height of the capacitor).

Example of calculation

P/N: C4AF9BW5100A3JK	$P_D(50) = 2 * \pi * 50 * 10 * 10^{-6} * 310^2 * 7 * 10^{-4} = 0.211$ [W]
Rated $V_{RMS} = 310$ [V_{RMS}]	$P_D(15{,}000) = [7.9^2/(2 * \pi * 15{,}000 * 10 * 10^{-6})] * 7 * 10^{-4} = 0.0463$ [W]
Rated $I_{RMS\ MAX} = 16.6$ [A]	$P_J(50) = 4.2 * 10^{-3} * [(2 * \pi * 50 * 10 * 10^{-6} * 310)^2] = 0.0398$ [W]
$R_s = 4.2$[mΩ]	$P_J(15000) = 4.2 * 10^{-3} * 7.9^2 = 0.262$ [W]
$R_{th} = 18$ [°C/W]	$P_T = 0.211+0.0463+0.0398+0.262 = 0.5591$ [W]
Fundamental Frequency $F_1 = 50$ [Hz]	$\Delta T_{HS} = 18 * 0.559 = 10$ [°C]
Ripple Frequency $F_2 = 15{,}000$ [Hz]	$T_{HS} = Ta + \Delta T_{HS}$
Fundamental Voltage $V_1 = 310$ [V~]	$T_{HS} = 75 + 10 = 85$ [°C] » OK since hot spot temperature is less than maximum admitted
Ripple Current $I_2 = 7.9$ [A]	Expected Life at $T_{HS} = 85$°C » 60,000 hours (see lifetime curve)
$T_a = 75$°C	
$I_1 = I(50) = 2 * \pi * 50 * 10 * 10^{-6} * 310 = 0.973$ [A]	
$V_2 = V(15{,}000) = [7.9/(2 * \pi * 15{,}000 * 10 * 10^{-6})] = 8.4$ [V]	

Environmental Compliance

As a leading global supplier of electronic components and an environmentally conscious company, KEMET continually works to improve the environmental effects of the manufacturing process 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 the use of certain hazardous materials including lead (Pb) in electronic equipment. KEMET monitors changes in legislation worldwide and endeavors to make any necessary changes to its electronic components, as necessary and/or required by law.

For medical, defense, automotive, and some commercial applications, the use of lead in the termination is necessary and/or required by design. KEMET is committed to communicating RoHS compliance to our customers. KEMET will provide information related to RoHS compliance using specific identifiers on the packaging labels.

All KEMET power film capacitors are RoHS compliant.

Materials & Environment

The selection of raw materials used by KEMET for the production of its electronic components is the result of extensive experience and with specific attention toward environmental protection. KEMET selects its suppliers according to ISO 9001 standards and performs statistical analysis on the raw materials purchased before acceptance for use in the manufacture of 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.

Insulation Resistance

As the capacitor temperature increases, the insulation resistance decreases. This is due to the 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
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, 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 an 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.

Table 1 – Ratings & Part Number Reference

Cap Value (µF)	V_{NAC}	V_{NDC}	Dimensions (mm)					dV/dt	Ipkr	ESL	R_S	I_{rms} maximum (*)	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
			B	H	L	p	p1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{NAC} at 85°C = 250 VAC; V_{OPAC} at 105°C = 175 VAC															
1	250	500	11	20	31.5	27.5	\	38	38	24	22	4.5	44	256	C4AF1BU4100A1WK
1.5	250	500	11	20	31.5	27.5	\	38	56	24	15.6	5.4	44	256	C4AF1BU4150A1WK
2.2	250	500	13	25	31.5	27.5	\	38	83	25	11.8	6.9	36	234	C4AF1BU4220A1XK
3.3	250	500	19	29	31.5	27.5	\	38	125	26	9	8.9	29	72	C4AF1BU4330A11K
4.7	250	500	19	29	31.5	27.5	\	38	179	26	7.4	10	29	72	C4AF1BU4470A11K
6.8	250	500	22	37	31.5	27.5	\	38	259	28	6.6	12.1	23	64	C4AF1BU4680A12K
7.5	250	500	22	37	31.5	27.5	\	38	285	28	6.4	12.3	23	64	C4AF1BU4750A12K
10	250	500	20	40	42	37.5	10.2	27	272	29	4.8	15.2	20	58	C4AF1BW5100A3FK
15	250	500	30	45	42	37.5	20.3	27	400	33	3.4	20.8	15	36	C4AF1BW5150A3LK
22	250	500	35	50	42	37.5	20.3	27	587	35	2.6	25.4	13	30	C4AF1BW5220A3OK
24.5	250	500	35	50	42	37.5	20.3	27	654	35	2.4	26.3	13	30	C4AF1BW5245A3OK
33	250	500	35	50	57.5	52.5	20.3	18	587	38	3.4	26.1	10	23	C4AF1BW5330A3NK
47	**250**	**500**	**45**	**56**	**57.5**	**52.5**	**20.3**	**18**	**837**	**41**	**2.8**	**32**	**8**	**18**	**C4AF1EW5470A3AK**
55	**250**	**500**	**45**	**56**	**57.5**	**52.5**	**20.3**	**18**	**960**	**41**	**2.4**	**33.9**	**8**	**18**	**C4AF1EW5550A3AK**
62	**250**	**500**	**45**	**65**	**57.5**	**52.5**	**20.3**	**18**	**1116**	**45**	**2.4**	**36.5**	**7**	**18**	**C4AF1EW5620A3BK**
V_{NAC} at 85°C = 310 VAC; V_{OPAC} at 105°C = 215 VAC															
1	310	630	11	20	31.5	27.5	\	45	45	24	20.8	4.5	44	256	C4AF9BU4100A1WK
1.5	310	630	13	25	31.5	27.5	\	45	68	25	15	6	36	234	C4AF9BU4150A1XK
2.2	310	630	14	28	31.5	27.5	\	45	99	26	11.4	7.2	33	96	C4AF9BU4220A1YK
3.3	310	630	19	29	31.5	27.5	\	45	149	26	8.6	9	29	72	C4AF9BU4330A11K
4.7	310	630	22	37	31.5	27.5	\	45	212	28	7.6	11	23	64	C4AF9BU4470A12K
6.8	310	630	20	40	42	37.5	10.2	32	218	30	5.8	13.5	20	58	C4AF9BW4680A3FK
10	310	630	28	37	42	37.5	10.2	32	320	29	4.2	16.6	15	36	C4AF9BW5100A3JK
15	310	630	35	50	42	37.5	20.3	32	480	35	3	23.1	13	30	C4AF9BW5150A3OK
17	310	630	35	50	42	37.5	20.3	32	560	35	2.8	23.8	13	30	C4AF9BW5170A3OK
22	310	630	35	50	57.5	52.5	20.3	21	462	38	4.2	23.2	10	23	C4AF9BW5220A3NK
33	**310**	**630**	**45**	**56**	**57.5**	**52.5**	**20.3**	**21**	**693**	**41**	**3**	**30.3**	**8**	**18**	**C4AF9EW5330A3AK**
37.5	**310**	**630**	**45**	**56**	**57.5**	**52.5**	**20.3**	**21**	**788**	**41**	**2.8**	**30.9**	**8**	**18**	**C4AF9EW5375A3AK**
42	**310**	**630**	**45**	**65**	**57.5**	**52.5**	**20.3**	**21**	**882**	**45**	**2.6**	**34.5**	**7**	**18**	**C4AF9EW5330A3BK**
Cap Value (µF)	**V_{NAC}**	**V_{NDC}**	**B**	**H**	**L**	**P**	**P1**	**V/µs**	**Apk**	**nH**	**mΩ**	**A_{rms}**	**(°C/W)**	**Packaging Quantity**	**PART NUMBER**
			Dimensions (mm)					**dV/dt**	**Ipkr**	**ESL**	**R_S**	**I_{rms} maximum (*)**	**Rth (HS/Amb)**		

For Packaging quantites not listed, please contact KEMET.
Items in bold font are only for sampling.
(*) Current corresponding to 30°C of self-heating in dry conditions and composed by nominal 50 Hz current at rated VAC plus 10 kHz overlapped harmonics. For Expected Life and FIT performances, please refer always to the Curves reported inside the datasheet based on working voltage and hot spot temperatures.

Table 1 – Ratings & Part Number Reference cont'd.

Cap Value (µF)	V_{NAC}	V_{NDC}	Dimensions (mm)					dV/dt	Ipkr	ESL	R_S	I_{rms} maximum (*)	Rth (HS/Amb)	Packaging Quantity	PART NUMBER
			B	H	L	p	p1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)		
V_{NAC} at 85°C = 350 VAC; V_{OPAC} at 105°C = 245 VAC															
1	**350**	**700**	**13**	**25**	**31.5**	**27.5**	****	**115**	**115**	**25**	**10.6**	**6.1**	**36**	**234**	**C4AF7BU4100A1XK**
1.5	**350**	**700**	**14**	**28**	**31.5**	**27.5**	****	**115**	**173**	**26**	**8.2**	**7.5**	**33**	**96**	**C4AF7BU4150A1YK**
2.2	**350**	**700**	**19**	**29**	**31.5**	**27.5**	****	**115**	**253**	**26**	**6.6**	**9.1**	**29**	**72**	**C4AF7BU4220A11K**
3.3	**350**	**700**	**22**	**37**	**31.5**	**27.5**	****	**115**	**380**	**28**	**6**	**11.4**	**23**	**64**	**C4AF7BU4330A12K**
3.7	**350**	**700**	**22**	**37**	**31.5**	**27.5**	****	**115**	**426**	**28**	**5.8**	**11.7**	**23**	**64**	**C4AF7BU4370A12K**
4.7	**350**	**700**	**20**	**40**	**42**	**37.5**	**10.2**	**75**	**353**	**30**	**4**	**14.7**	**20**	**58**	**C4AF7BW4470A3FK**
6.8	**350**	**700**	**28**	**37**	**42**	**37.5**	**10.2**	**75**	**510**	**29**	**2.8**	**18.3**	**18**	**36**	**C4AF7BW4680A3JK**
10	**350**	**700**	**35**	**50**	**42**	**37.5**	**20.3**	**75**	**750**	**35**	**2.2**	**24.8**	**13**	**30**	**C4AF7BW5100A3OK**
12.5	**350**	**700**	**35**	**50**	**42**	**37.5**	**20.3**	**75**	**938**	**35**	**2**	**26.1**	**13**	**30**	**C4AF7BW5125A3OK**
15	**350**	**700**	**35**	**50**	**57.5**	**52.5**	**20.3**	**50**	**750**	**38**	**2.8**	**27.1**	**10**	**23**	**C4AF7BW5150A3NK**
22	**350**	**700**	**45**	**56**	**57.5**	**52.5**	**20.3**	**50**	**1100**	**41**	**2.2**	**34.2**	**8**	**18**	**C4AF7EW5220A3AK**
27	**350**	**700**	**45**	**56**	**57.5**	**52.5**	**20.3**	**50**	**1350**	**41**	**2.0**	**35.4**	**8**	**18**	**C4AF7EW5270A3AK**
32	**350**	**700**	**45**	**65**	**57.5**	**52.5**	**20.3**	**50**	**1600**	**41**	**1.8**	**39.9**	**7**	**18**	**C4AF7EW5320A3BK**
V_{NAC} at 85°C = 400 VAC; V_{OPAC} at 105°C = 280 VAC															
1	400	800	14	28	31.5	27.5	\\	141	141	26	9.8	6.5	33	96	C4AF3BU4100A1YK
1.5	400	800	19	29	31.5	27.5	\\	141	212	26	7.6	8.1	29	72	C4AF3BU4150A11K
2.2	400	800	22	37	31.5	27.5	\\	141	310	28	6.8	10.2	23	64	C4AF3BU4220A12K
2.5	400	800	22	37	31.5	27.5	\\	141	353	28	6.4	10.6	23	64	C4AF3BU4250A12K
3.3	400	800	20	40	42	37.5	10.2	90	297	30	4.8	13	20	58	C4AF3BW4330A3FK
4.7	400	800	28	37	42	37.5	10.2	90	423	29	3.4	16.1	18	36	C4AF3BW4470A3JK
6.8	400	800	30	45	42	37.5	20.3	90	612	33	2.6	20.4	15	36	C4AF3BW4680A3LK
9	400	800	35	50	42	37.5	20.3	90	810	35	2.2	24.1	13	30	C4AF3BW4900A3OK
10	400	800	30	45	57.5	52.5	20.3	61	610	35	3.4	21.8	12	27	C4AF3BW5100A3MK
15	**400**	**800**	**45**	**56**	**57.5**	**52.5**	**20.3**	**61**	**915**	**41**	**2.6**	**31.1**	**8**	**18**	**C4AF3EW5150A3AK**
20	**400**	**800**	**45**	**56**	**57.5**	**52.5**	**20.3**	**61**	**1220**	**41**	**2.2**	**33.3**	**8**	**18**	**C4AF3EW5200A3AK**
22.5	**400**	**800**	**45**	**65**	**57.5**	**52.5**	**20.3**	**61**	**1373**	**45**	**2**	**37.4**	**7**	**18**	**C4AF3EW5225A3BK**
Cap Value (µF)	V_{NAC}	V_{NDC}	B	H	L	P	P1	V/µs	Apk	nH	mΩ	A_{rms}	(°C/W)	Packaging Quantity	PART NUMBER
			Dimensions (mm)					dV/dt	Ipkr	ESL	R_S	I_{rms} maximum (*)	Rth (HS/Amb)		

For Packaging quantites not listed, please contact KEMET.
Items in bold font are only for sampling.
(*) Current corresponding to 30°C of self-heating in dry conditions and composed by nominal 50 Hz current at rated VAC plus 10 kHz overlapped harmonics. For Expected Life and FIT performances, please refer always to the Curves reported inside the data-sheet based on working voltage and hot spot temperatures

Soldering Process

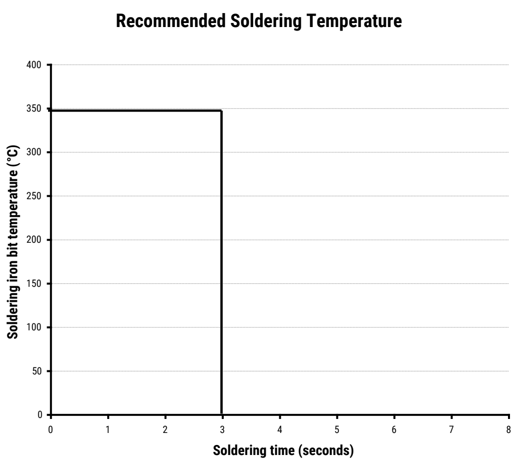
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183°C for SnPb eutectic alloy to 217 – 221°C for the new alloys. As a result, the heat stress to the components, even 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 mm to 15 mm), and great care has to be taken during soldering. The recommended solder profiles from KEMET should be used. Please consult 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. Please see Figure 1.

Reflow soldering is not recommended for through-hole film capacitors. Exposing capacitors to a soldering profile in excess of the above the recommended limits may result to 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 the curing of surface mount parts. Consult 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. Please allow time for the capacitor surface temperature to return to a normal temperature before the second soldering cycle.

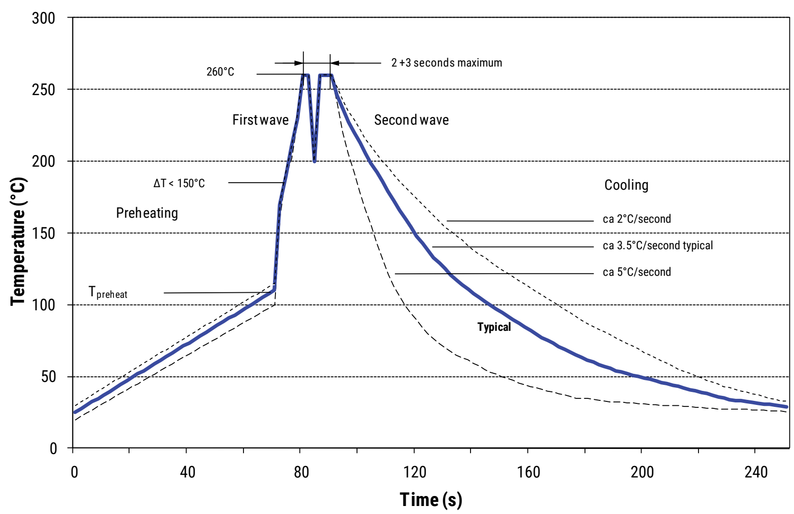
Manual Soldering Recommendations

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'd

Wave Soldering Recommendations cont'd

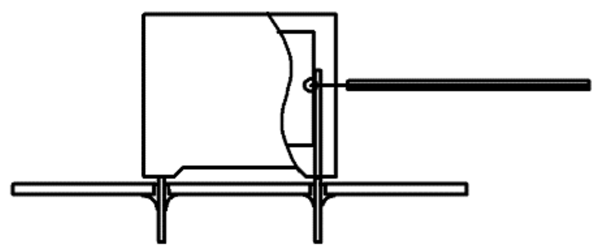
1. The table indicates the maximum set-up temperature of the soldering process.

Figure 1

Dielectric Film Material	Maximum Preheat Temperature			Maximum Peak Soldering Temperature	
	Capacitor Pitch ≤ 10 mm	Capacitor Pitch = 15 mm	Capacitor Pitch > 15 mm	Capacitor Pitch ≤ 15 mm	Capacitor Pitch > 15 mm
Polyester	130°C	130°C	130°C	270°C	270°C
Polypropylene	100°C	110°C	130°C	260°C	270°C
Paper	130°C	130°C	140°C	270°C	270°C
Polyphenylene Sulphide	150°C	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



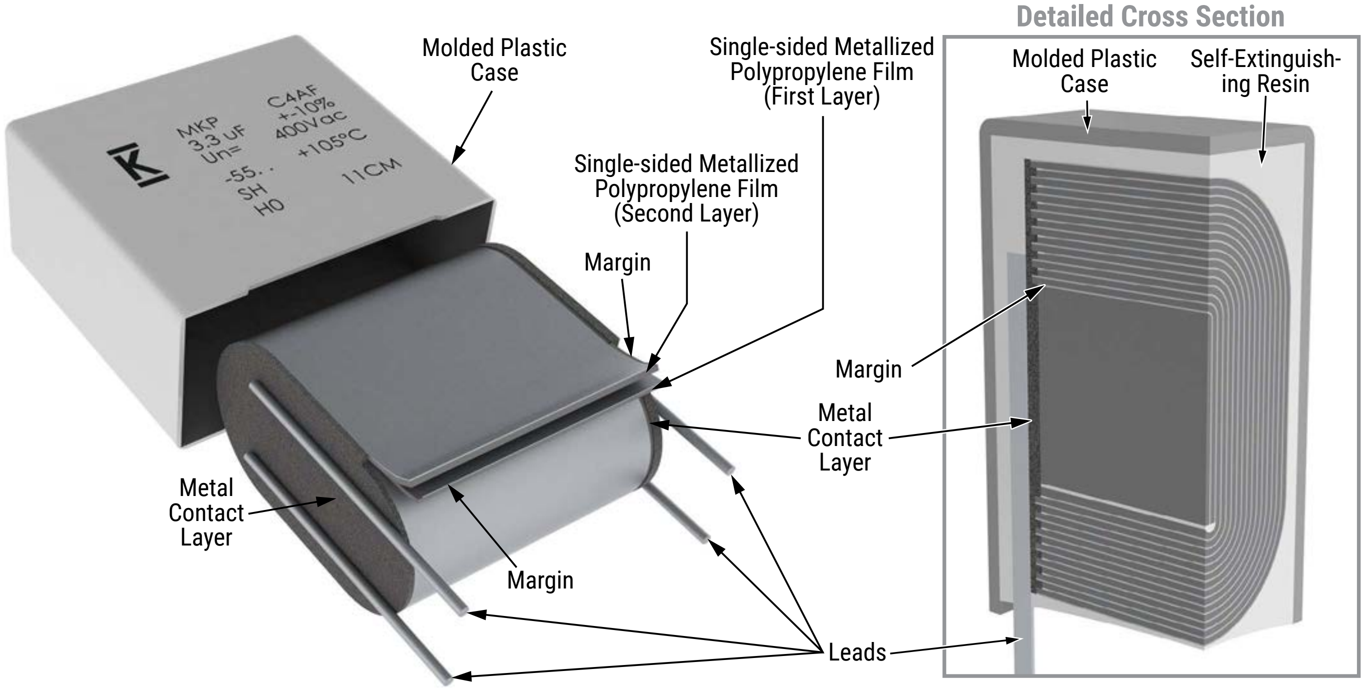
Temperature monitored inside the capacitor.

Selective Soldering Recommendations

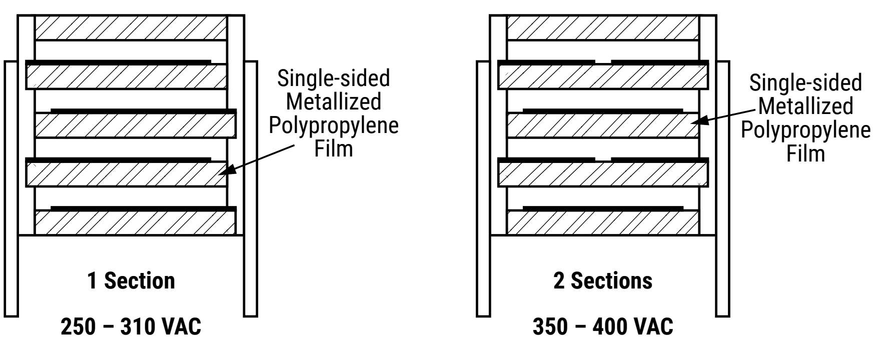
Selective dip soldering is a variation of reflow soldering. In this method, the printed circuit board with through-hole components to be soldered is preheated and transported over the solder bath as in normal flow soldering without touching the solder. When the board is over the bath, it is stopped and 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 bath with a time from 3 to 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 are not overheated.

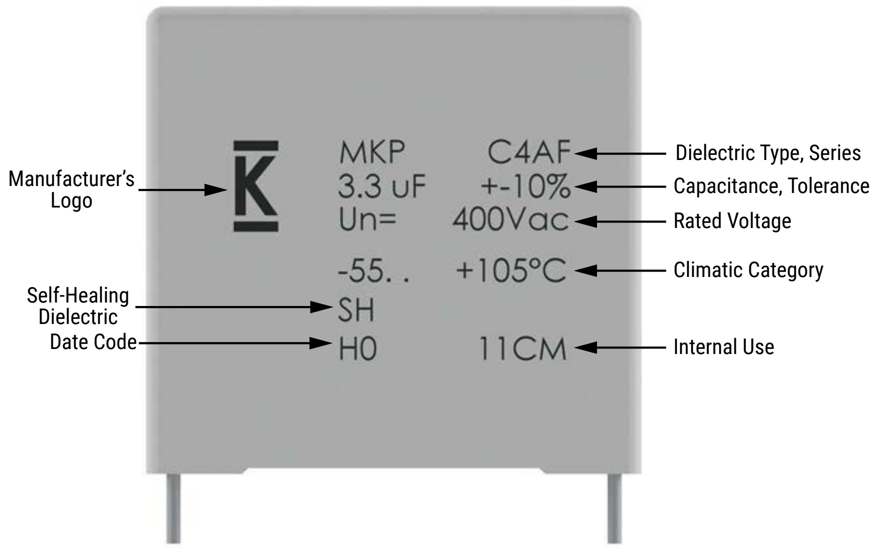
Construction



Winding Scheme



Marking



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

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