Printed Circuit Board Mount Power Film Capacitors

C4AT, Radial, 2 or 4 Leads, 250 – 850 VDC/160 – 450 VAC

Overview

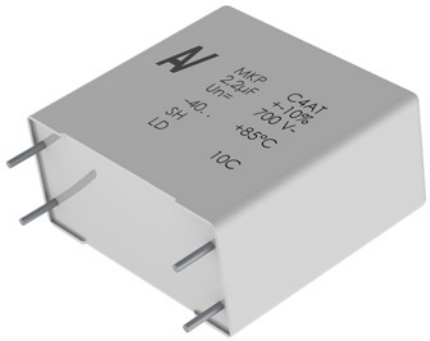
The C4AT capacitor is a polypropylene metallized film capacitor with a rectangular, plastic box-type design filled with resin, and uses 2 or 4 tinned copper wires.

Applications

Typical applications include clamping, DC filtering, blocking, coupling/decoupling, AC harmonic filtering, and energy storage.

Benefits

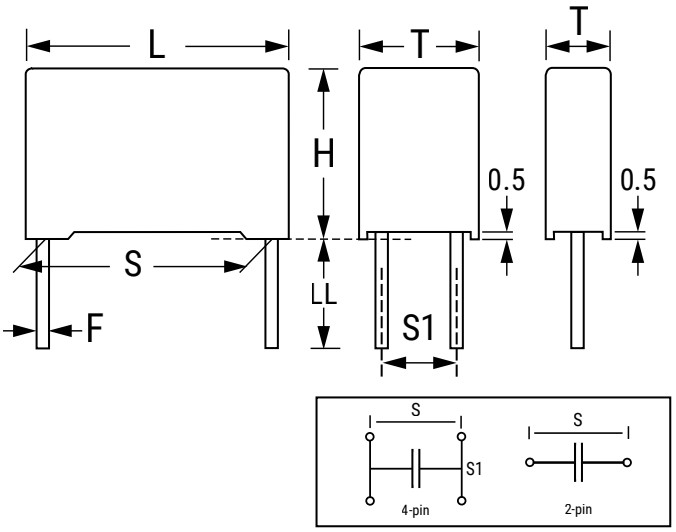
- Self-healing
- Low loss
- High ripple current
- High contact reliability
- Suitable for high frequency applications



Part Number System

C4	AT	D	B	U	4100	A3	0	J
Series	Type	Rated Voltage (VDC)	Case	Number of Leads	Capacitance Code (pF)	Lead Diameter (mm)	Size Code	Tolerance
C4 = MKP Capacitors	AT = Radial box, switching application	D = 250 F = 400 G = 450 H = 600 J = 700 M = 850	B = Plastic box with thermosetting resin sealing	U = 2 lead W = 4 lead	Digits 2-4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	A1 = 0.8 A3 = 1.2	See Dimension Table	J = 5% K = 10%

Dimensions – Millimeters



Size Code	S	S1	T		H		L		LL
	±0.4	±0.4	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	+0/−2
A	27.5		10	+0/−0.7	20	+0/−0.7	32	+0/−0.7	6
B	27.5	5.1	13	+0/−0.7	22	+0/−0.7	32	+0/−0.7	6
C	27.5	5.1	14	+0/−0.7	28	+0/−0.7	32	+0/−0.7	6
E	27.5	5.1	18	+0/−0.7	33	+0/−0.7	32	+0/−0.7	6
G	27.5	10.2	22	+0/−0.7	37	+0/−0.7	32	+0/−0.7	6
F	37.5	10.2	20	+0/−0.7	40	+0/−0.7	41.5	+0/−0.7	6
H	37.5	10.2	24	+0/−0.7	44	+0/−0.7	41.5	+0/−0.7	6
J	37.5	10.2	28	+0/−0.7	37	+0/−0.7	42.5	+0/−0.7	6
L	37.5	20.3	30	+0/−0.7	45	+0/−0.7	42	+0/−0.7	6
M	52.5	20.3	30	+0/−0.7	45	+0/−0.7	57.5	+0/−0.7	6
N	52.5	20.3	35	+0/−0.7	50	+0/−0.7	57.5	+0/−0.7	6

Note 1: 250 V capacitors use a size code of "0" for all case sizes.
Note 2: Wire diameter (F): See Table "Part Numbers".

Qualifications

Reference Standards	IEC 61071, EN61071, VDE0560
Climatic Category	40/85/56 according to IEC 60068–1

Performance Characteristics

Temperature Range	−40°C to + 85°C
Maximum Permissible Ambient Temperature	+70°C
Capacitance Tolerance	±5%, ±10%
IEC Climatic Category	40/85/56 according to IEC 68–1
Peak Non-Repetitive Maximum Current	I_{PKR} x 1.5
Test Voltage Terminal to Terminal V_{TT}	2 V_n for 10 seconds
Test Voltage Terminal to Case V_{TC}	3k V – 50 Hz for 60 seconds
Dissipation Factor (DF)	≥ 5 x 10^{-4} at 1 kHz and 20°C
Acceptable Relative Humidity	Annual average ≤ 70% ≤ 85% for ≤ 30 intermittant days annually Dewing not admissible
Capacitance Deviation in Operating Temperature Range of −40°C to +85°C	±1.5% maximum on capacitance value measured at +20°C
Change of Capacitance vs. Operating Time	−3% after 30,000 hours at V_{RMS} or after 100,000 hours at V_n
Case Components	Solvent-resistant plastic case with epoxy resin sealing, flame retardant execution (UL Class 94V–0)
Terminals	Tinned copper 2 or 4 wires
Installation	Any position
Life Expectancy	≥ 30,000 hours at V_{RMS}, ≥ 100,000 hours at V_n
Failure Quota	300/10^9 components per hour

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.

Table 1A – Ratings & Part Number Reference

Part Number	Cap Value (µF)	VDC	VAC	Peak VDC	Size Code	Maximum Dimensions (mm)				
						S	S1	T	H	L
C4ATDBU4100(2)0(3)	1	250	160	400	0	27.5	-	10	20	32
C4ATDBU4220(2)0(3)	2.2	250	160	400	0	27.5	-	10	20	32
C4ATDBU4330(2)0(3)	3.3	250	160	400	0	27.5	-	13	22	32
C4ATDBU4500(2)0(3)	5	250	160	400	0	27.5	-	14	28	32
C4ATDBW5100(2)0(3)	10	250	160	400	0	27.5	5.1	18	33	32
C4ATDBW5200(2)0(3)	20	250	160	400	0	37.5	10.2	28	37	42.5
C4ATDBW5300(2)0(3)	30	250	160	400	0	37.5	20.3	30	45	42.5
C4ATDBW5400(2)0(3)	40	250	160	400	0	52.5	20.3	30	45	57.5
C4ATDBW5500(2)0(3)	50	250	160	400	0	52.5	20.3	35	50	57.5
C4ATDBW5600(2)0(3)	60	250	160	400	0	52.5	20.3	35	50	57.5
C4ATFBU4100(2)A(3)	1	400	250	600	A	27.5	-	10	20	32
C4ATFBU4150(2)A(3)	1.5	400	250	600	A	27.5	-	10	20	32
C4ATFBU4200(2)B(3)	2	400	250	600	B	27.5	-	13	22	32
C4ATFBW4330(2)C(3)	3.3	400	250	600	C	27.5	5.1	14	28	32
C4ATFBW4400(2)E(3)	4	400	250	600	E	27.5	5.1	18	33	32
C4ATFBW4500(2)E(3)	5	400	250	600	E	27.5	5.1	18	33	32
C4ATFBW4680(2)G(3)	6.8	400	250	600	G	27.5	10.2	22	37	32
C4ATFBW5100(2)F(3)	10	400	250	600	F	37.5	10.2	20	40	41.5
C4ATFBW5150(2)J(3)	15	400	250	600	J	37.5	10.2	28	37	42.5
C4ATFBW5200(2)L(3)	20	400	250	600	L	37.5	20.3	30	45	42
C4ATFBW5250(2)M(3)	25	400	250	600	M	52.5	20.3	30	45	57.5
C4ATFBW5300(2)M(3)	30	400	250	600	M	52.5	20.3	30	45	57.5
C4ATFBW5350(2)N(3)	35	400	250	600	N	52.5	20.3	35	50	57.5
C4ATFBW5400(2)N(3)	40	400	250	600	N	52.5	20.3	35	50	57.5
C4ATGBU4100(2)A(3)	1	450	275	660	A	27.5	-	10	20	32
C4ATGBW4330(2)E(3)	3.3	450	275	660	E	27.5	5.1	18	33	32
C4ATGBW4680(2)G(3)	6.8	450	275	660	G	27.5	10.2	22	37	32
C4ATGBW5100(2)F(3)	10	450	275	660	F	37.5	10.2	20	40	41.5
C4ATGBW5150(2)L(3)	15	450	275	660	L	37.5	20.3	30	45	42
C4ATGBW5200(2)M(3)	20	450	275	660	M	52.5	20.3	30	45	57.5
C4ATGBW5330(2)N(3)	33	450	275	660	N	52.5	20.3	35	50	57.5
C4ATHBU3680(2)A(3)	0.68	600	350	800	A	27.5	-	10	20	32
C4ATHBU4100(2)B(3)	1	600	350	800	B	27.5	-	13	22	32
C4ATHBW4200(2)E(3)	2	600	350	800	E	27.5	5.1	18	33	32
C4ATHBW4220(2)E(3)	2.2	600	350	800	E	27.5	5.1	18	33	32
C4ATHBW4330(2)G(3)	3.3	600	350	800	G	27.5	10.2	22	37	32
C4ATHBW4470(2)F(3)	4.7	600	350	800	F	37.5	10.2	20	40	41.5
C4ATHBW4500(2)F(3)	5	600	350	800	F	37.5	10.2	20	40	41.5
C4ATHBW4680(2)J(3)	6.8	600	350	800	J	37.5	10.2	28	37	42
C4ATHBW4900(2)L(3)	9	600	350	800	L	37.5	20.3	30	45	42
C4ATHBW5100(2)L(3)	10	600	350	800	L	37.5	20.3	30	45	42
C4ATHBW5120(2)M(3)	12	600	350	800	M	52.5	20.3	30	45	57.5
C4ATHBW5200(2)N(3)	20	600	350	800	N	52.5	20.3	35	50	57.5
C4ATJBU3470(2)A(3)	0.47	700	400	1000	A	27.5	-	10	20	32
C4ATJBW4100(2)D(3)	1	700	400	1000	D	27.5	5.1	15	24.5	32
C4ATJBW4150(2)E(3)	1.5	700	400	1000	E	27.5	5.1	18	33	32
C4ATJBW4220(2)E(3)	2.2	700	400	1000	E	27.5	5.1	18	33	32
C4ATJBW4300(2)G(3)	3	700	400	1000	G	27.5	10.2	22	37	32
C4ATJBW4500(2)L(3)	5	700	400	1000	L	37.5	10.2	28	37	42.5
C4ATJBW4900(2)M(3)	9	700	400	1000	M	52.5	20.3	30	45	57.5
C4ATJBW5100(2)M(3)	10	700	400	1000	M	52.5	20.3	30	45	57.5
C4ATJBW5150(2)N(3)	15	700	400	1000	N	52.5	20.3	35	50	57.5
C4ATMBU3220(2)A(3)	0.22	850	450	1200	A	27.5	-	10	20	32
C4ATMBU3470(2)B(3)	0.47	850	450	1200	B	27.5	-	13	22	32
C4ATMBW4100(2)E(3)	1	850	450	1200	E	27.5	5.1	18	33	32
C4ATMBW4150(2)G(3)	1.5	850	450	1200	G	27.5	10.2	22	37	32
C4ATMBW4330(2)J(3)	3.3	850	450	1200	J	37.5	10.2	28	37	42.5
C4ATMBW4470(2)L(3)	4.7	850	450	1200	L	37.5	20.3	30	45	42
C4ATMBW4680(2)M(3)	6.8	850	450	1200	M	52.5	20.3	30	45	57.5
C4ATMBW5100(2)N(3)	10	850	450	1200	N	52.5	20.3	35	50	57.5
Part Number	Cap Value (µF)	VDC	VAC	Peak VDC	Size Code	S	S1	T	H	L
						Maximum Dimensions (mm)				

(2) Lead Diameter: A1 = 0.8, A3 = 1.2

(3) K = ±10%, J = ±5%

Table 1B – Ratings & Part Number Reference

Part Number	Ripple Current 100 kHz 70°C (A)			Peak Current (A)	ESR (Maximum) 100 kHz (mΩ)			dV/dt (V/µs)	Packaging Quantity
	2 wires		4 wires		2 wires		4 wires		
	F=0.8	F=1.2	F=1.2		F=0.8	F=1.2	F=1.2		
C4ATDBU4100(2)0(3)	5	5	-	30	23.3	22.6	-	30	288
C4ATDBU4220(2)0(3)	7	8	-	66	11.8	11	-	30	288
C4ATDBU4330(2)0(3)	7	10	-	99	8.7	7.8	-	30	234
C4ATDBU4500(2)0(3)	7	12	-	150	6.8	5.8	-	30	96
C4ATDBW5100(2)0(3)	7	12	20	300	5.2	4	3.1	30	80
C4ATDBW5200(2)0(3)	7	12	22	400	5.5	4.2	3.1	20	36
C4ATDBW5300(2)0(3)	7	12	22	600	5.3	3.7	2.6	20	36
C4ATDBW5400(2)0(3)	7	12	22	600	5.7	4.2	3.1	15	27
C4ATDBW5500(2)0(3)	7	12	22	750	5.7	4.1	2.8	15	23
C4ATDBW5600(2)0(3)	7	12	22	900	5.7	3.9	2.6	15	21
C4ATFBU4100(2)A(3)	8	8	-	74	10.8	10.2	-	74	288
C4ATFBU4150(2)A(3)	8	10	-	111	7.7	7.1	-	74	288
C4ATFBU4200(2)B(3)	9	11	-	148	6.3	5.6	-	74	234
C4ATFBW4330(2)C(3)	9	13	18	244	4.8	4	3.1	74	96
C4ATFBW4400(2)E(3)	9	14	21	296	4.5	3.6	2.6	74	80
C4ATFBW4500(2)E(3)	9	14	23	370	4	3.2	2.2	74	80
C4ATFBW4680(2)G(3)	9	14	25	504	3.8	2.8	1.7	74	64
C4ATFBW5100(2)F(3)	9	14	28	502	4.3	3.3	2.2	50	58
C4ATFBW5150(2)J(3)	9	14	25	753	4	2.9	1.7	50	36
C4ATFBW5200(2)L(3)	9	14	29	1004	3.7	2.6	1.4	50	36
C4ATFBW5250(2)M(3)	9	14	29	846	4.4	3.3	2	34	27
C4ATFBW5300(2)M(3)	9	14	29	1015	4.1	3	1.7	34	27
C4ATFBW5350(2)N(3)	9	14	29	1184	4.2	2.9	1.6	34	23
C4ATFBW5400(2)N(3)	9	14	29	1350	4	2.8	1.4	34	23
C4ATGBU4100(2)A(3)	8	8	-	82	10	9.4	-	82	288
C4ATGBW4330(2)E(3)	9	14	21	269	4.8	3.8	2.9	82	80
C4ATGBW4680(2)G(3)	9	14	29	554	3.6	2.7	1.6	82	64
C4ATGBW5100(2)F(3)	9	14	29	552	4.5	3.3	2.1	55	58
C4ATGBW5150(2)L(3)	9	14	29	828	3.9	2.8	1.6	55	36
C4ATGBW5200(2)M(3)	9	14	29	744	4.6	3.5	2.2	37	27
Part Number	F=0.8	F=1.2	F=1.2	(A)	F=0.8	F=1.2	F=1.2	dV/dt (V/µs)	Packaging Quantity
	2 wires		4 wires	Peak Current	2 wires		4 wires		
	Ripple Current				ESR (Maximum)				

(2) Lead Diameter: A1 = 0.8, A3 = 1.2 *(3) K = ±10%, J = ±5%*

Table 1B – Ratings & Part Number Reference cont.

Part Number	Ripple Current 100 kHz 70°C (A)			Peak Current (A)	ESR (Maximum) 100 kHz (mΩ)			dV/dt (V/µs)	Packaging Quantity
	2 wires		4 wires		2 wires		4 wires		
	F=0.8	F=1.2	F=1.2		F=0.8	F=1.2	F=1.2		
C4ATGBW5330(2)N(3)	9	14	29	1228	4.1	2.9	1.5	37	23
C4ATHBU3680(2)A(3)	8	8	-	70	11.5	10.9	-	104	288
C4ATHBU4100(2)B(3)	9	10	-	103	8.4	7.7	-	104	234
C4ATHBW4200(2)E(3)	9	14	18	207	5.6	4.7	3.7	104	80
C4ATHBW4220(2)E(3)	9	14	19	228	5.3	4.4	3.4	104	80
C4ATHBW4330(2)G(3)	9	14	25	342	4.4	3.5	2.4	104	64
C4ATHBW4470(2)F(3)	9	14	22	330	5.3	4.4	3.3	70	58
C4ATHBW4500(2)F(3)	9	14	22	351	5.2	4.2	3.1	70	58
C4ATHBW4680(2)J(3)	9	14	28	477	4.8	3.6	2.4	70	36
C4ATHBW4900(2)L(3)	9	14	29	632	4.3	3.2	1.9	70	36
C4ATHBW5100(2)L(3)	9	14	29	702	4.1	3	1.8	70	36
C4ATHBW5120(2)M(3)	9	14	29	568	5.2	4	2.8	47	27
C4ATHBW5200(2)N(3)	9	14	29	947	4.5	3.2	1.9	47	23
C4ATJBU3470(2)A(3)	7	7	-	55	14.3	13.6	-	119	288
C4ATJBW4100(2)D(3)	9	12	13	119	7.9	7.1	6.3	119	192
C4ATJBW4150(2)E(3)	9	14	17	178	6.2	5.3	4.3	119	80
C4ATJBW4220(2)E(3)	9	14	20	260	4.9	4	3	119	80
C4ATJBW4300(2)G(3)	9	14	25	355	4.4	3.4	2.3	119	64
C4ATJBW4500(2)L(3)	8	14	27	400	4.8	3.8	2.8	80	36
C4ATJBW4900(2)M(3)	9	14	29	487	5.6	4.5	3.2	54	27
C4ATJBW5100(2)M(3)	9	14	29	540	5.3	4.2	2.9	54	27
C4ATJBW5150(2)N(3)	9	14	29	811	4.7	3.5	2.1	54	23
C4ATMBU3220(2)A(3)	5	5	-	32.6	23.8	23.1	-	148	288
C4ATMBU3470(2)B(3)	8	8	-	69	12.1	11.4	-	148	234
C4ATMBW4100(2)E(3)	9	14	16	148	7.1	6.2	5.2	148	80
C4ATMBW4150(2)G(3)	9	14	21	222	5.6	4.7	3.6	148	64
C4ATMBW4330(2)J(3)	9	14	24	331	5.7	4.6	3.3	100	36
C4ATMBW4470(2)L(3)	9	14	29	471	4.8	3.7	2.5	100	36
C4ATMBW4680(2)M(3)	9	14	28	460	5.8	4.6	3.4	68	27
C4ATMBW5100(2)N(3)	9	14	29	676	5.1	3.8	2.5	68	23
Part Number	F=0.8	F=1.2	F=1.2	(A)	F=0.8	F=1.2	F=1.2	dV/dt (V/µs)	Packaging Quantity
	2 wires		4 wires	Peak Current	2 wires		4 wires		
	Ripple Current				ESR (Maximum)				

(2) Lead Diameter: A1 = 0.8, A3 = 1.2 *(3) K = ±10%, J = ±5%*

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

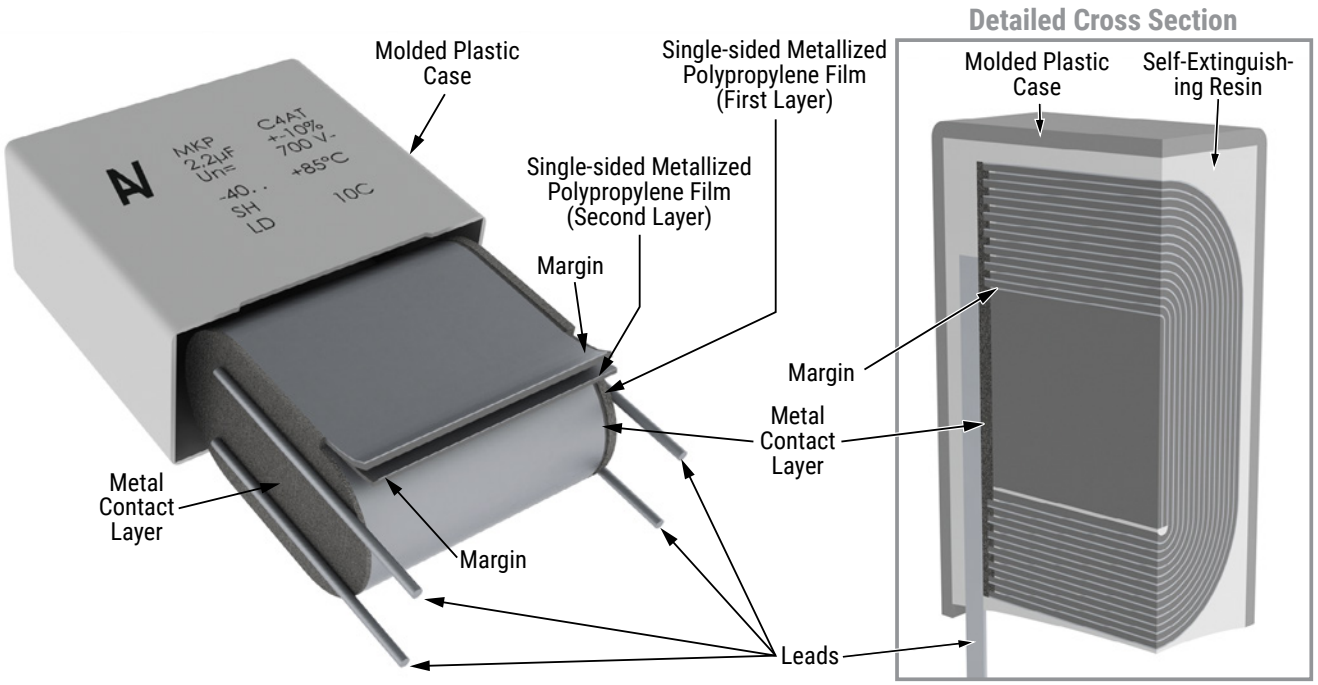
Dissipation factor is a complex function involved with capacitor inefficiency. The tgδ may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

Sealing

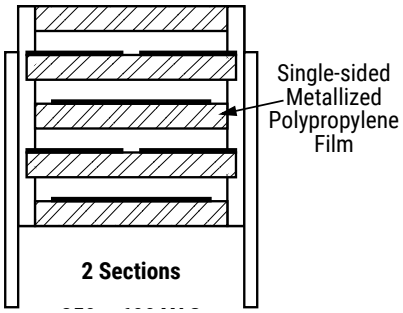
Hermetically Sealed Capacitors
As the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor. Such a breach can result in leakage, impregnation, filling fluid, or moisture susceptibility.

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.

Construction

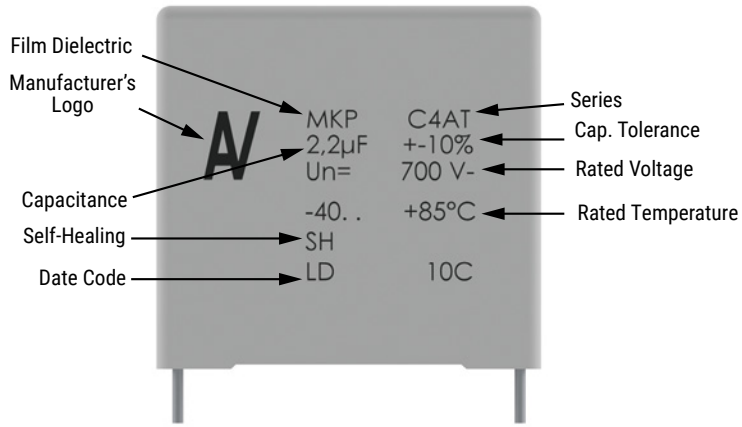


Winding Scheme



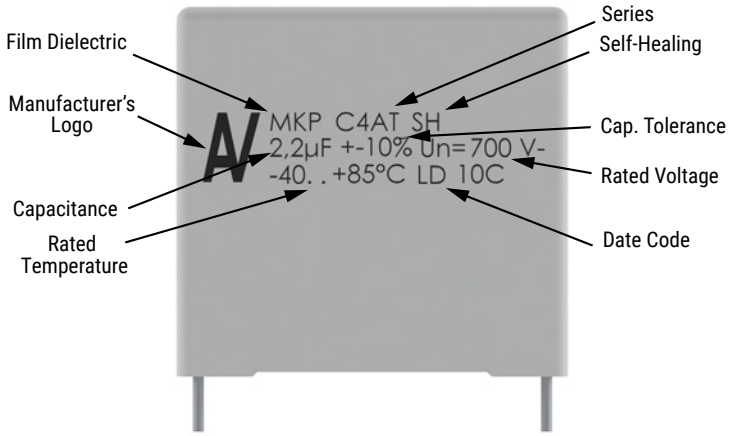
Marking

FRONT



OR

FRONT



**Marking layout depends on the production line*

Slight change in the layout can be possible but this does not affect the content of the information of the current marking.
This change will be achieved without impact to product form, fit or function, as the products are equivalent with respect to physical, mechanical, quality and reliability characteristics.

Manufacturing Date Code (IEC 60062)									
Year	Code	Year	Code	Year	Code	Month	Code	Month	Code
2020	M	2027	V	2034	E	January	1	July	7
2021	N	2028	W	2035	F	February	2	August	8
2022	P	2029	X	2036	H	March	3	September	9
2023	R	2030	A	2037	J	April	4	October	O
2024	S	2031	B	2038	K	May	5	November	N
2025	T	2032	C	2039	L	June	6	December	D
2026	U	2033	D	2040	M				

KEMET Electronics Corporation Sales Offices

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

Disclaimer

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Additional information about production site flexibility can be found <here>