

## Overview

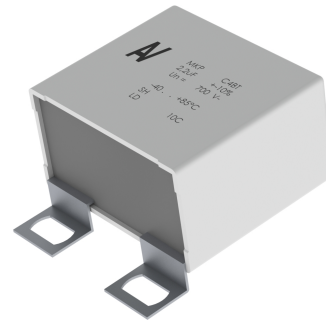
The C4BT capacitor is a polypropylene metallized film capacitor with a rectangular, plastic box-type design filled with resin. It has a tinned brass lug direct IGBT mounting.

## Applications

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

## Benefits

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

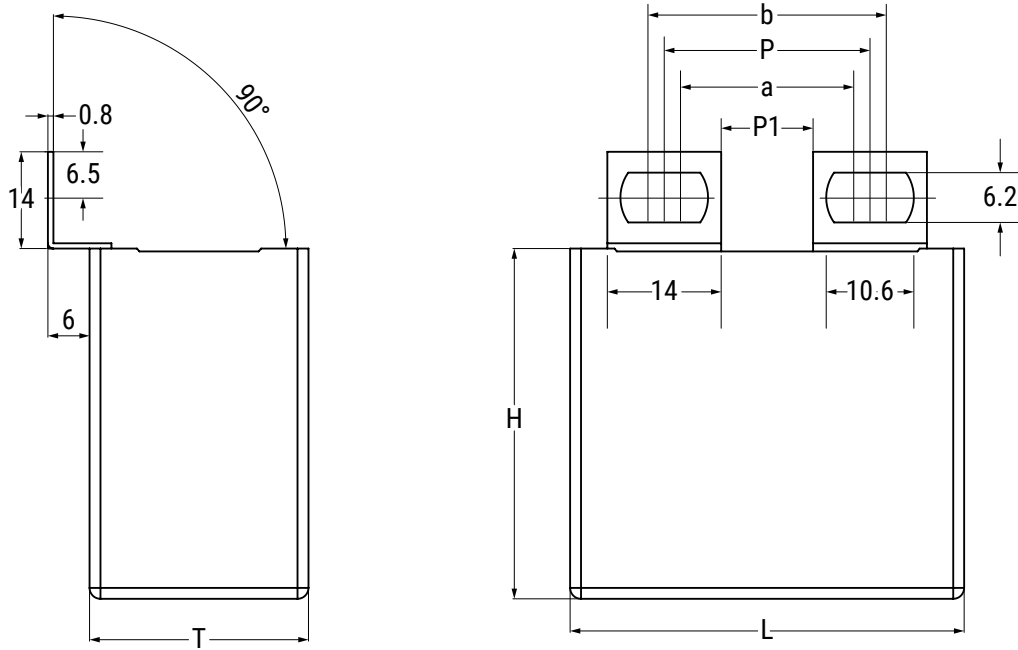


## Part Number System

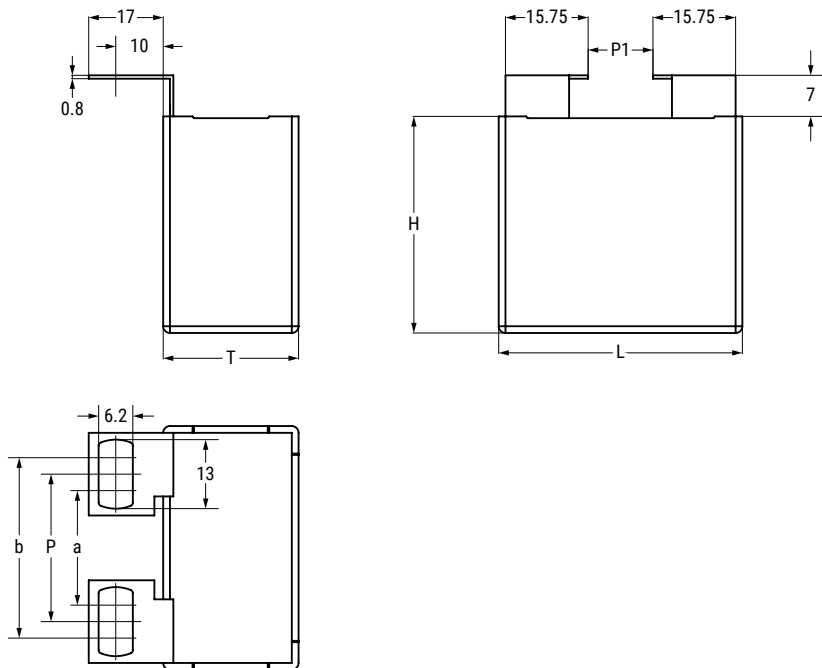
C4	BT	F	B	X	4330	Z	E	E	J
Series	Type	Rated Voltage (VDC)	Case	Lead Specification	Capacitance Code (pF)	Internal Code	Termination Style	Size Code	Tolerance
C4 = MKP Capacitors for Power Applications	BT = Radial box with tab terminals, switching application	D = 250 F = 400 H = 600 J = 700 M = 850	B = Plastic box with thermosetting resin sealing	X = Standard	Digits 2-4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	Z = Standard	A = Style A B = Style B D = Style D E = Style E F = Style F G = Style G H = Style H M = Style M T = Style T W = Style W X = Style X	See Dimension Table	J = 5% K = 10%

## Dimensions – Millimeters

### Style A

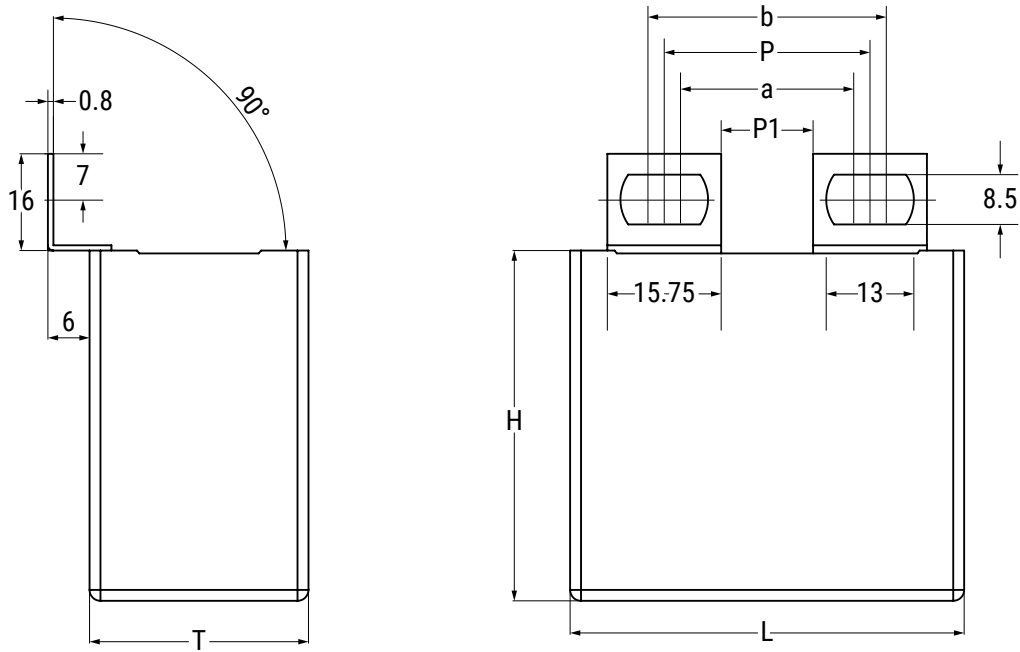


### Style B

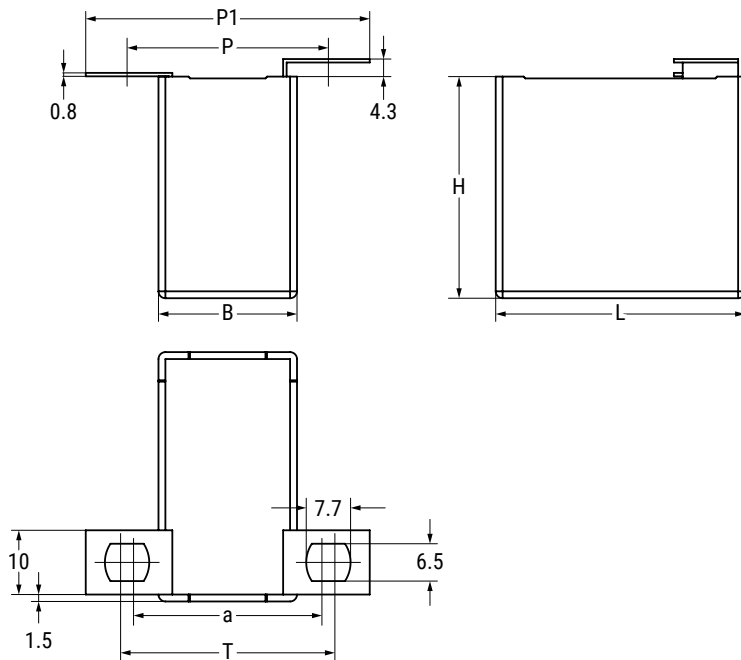


## Dimensions – Millimeters cont.

### Style D

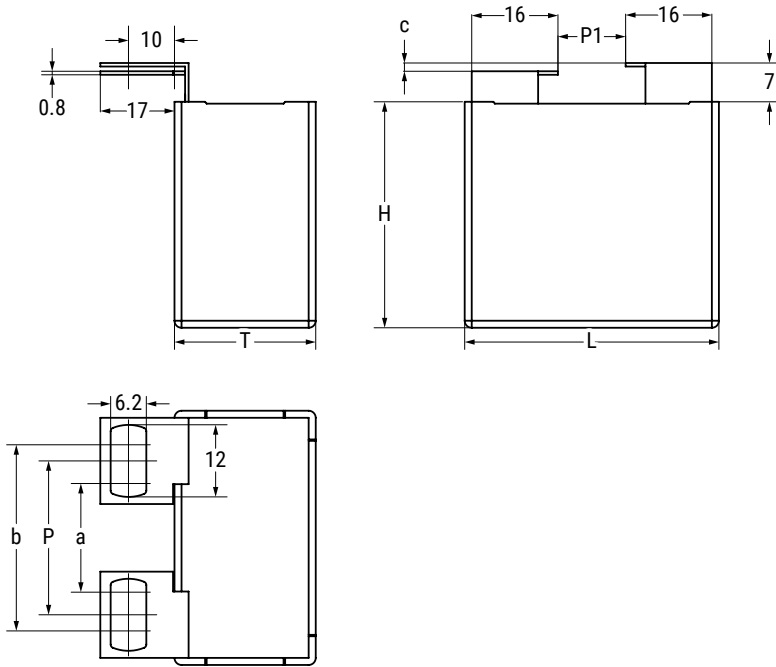


### Style E

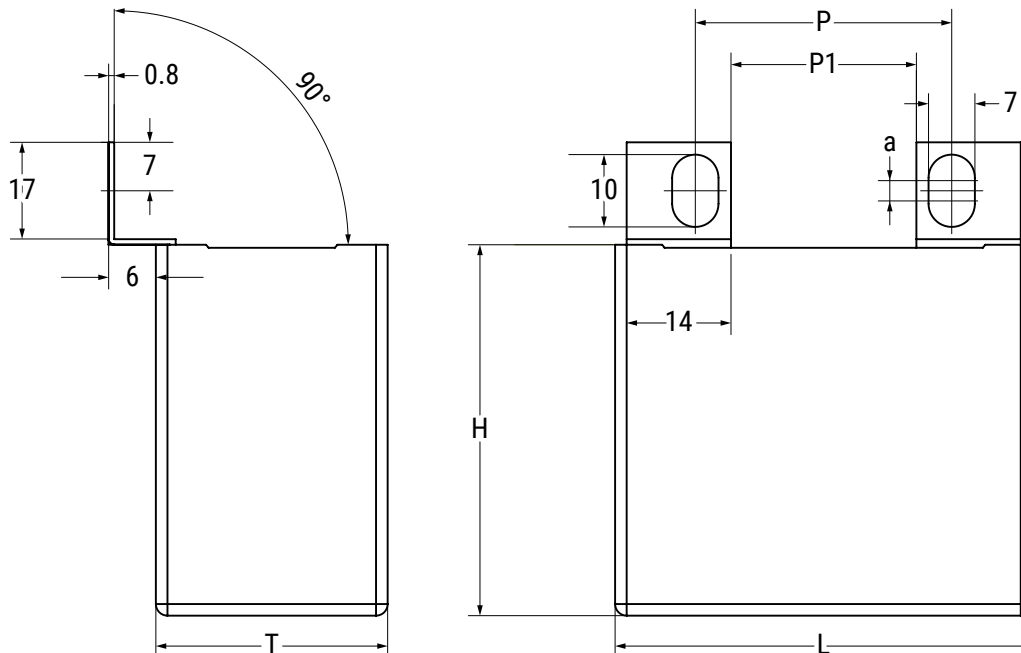


## Dimensions – Millimeters cont.

### Style F

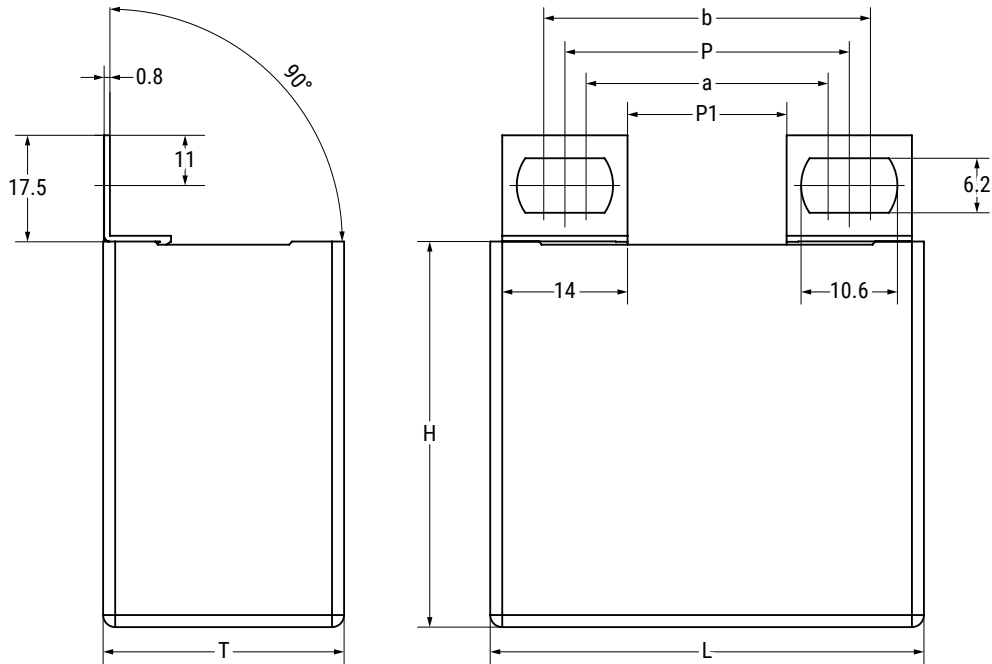


### Style G

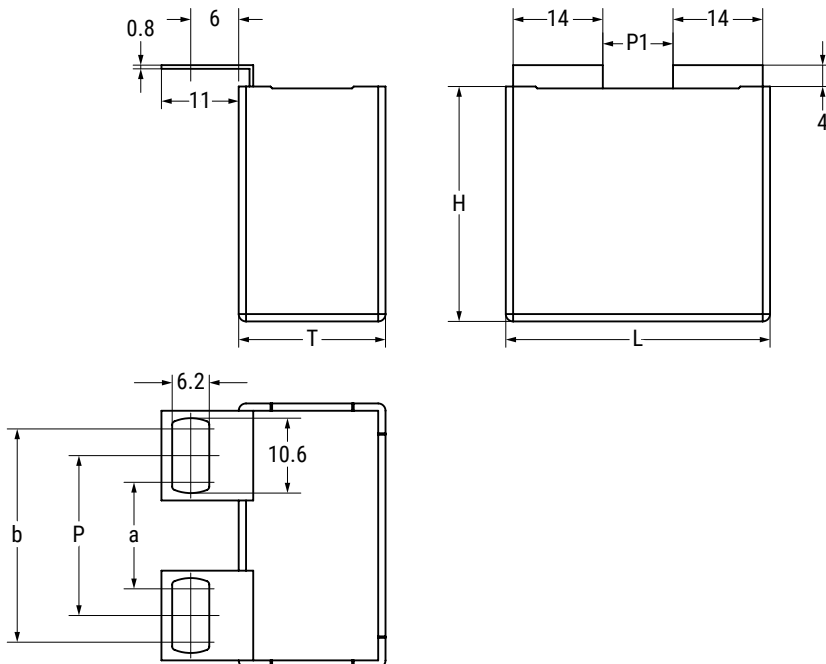


## Dimensions – Millimeters cont.

### Style H

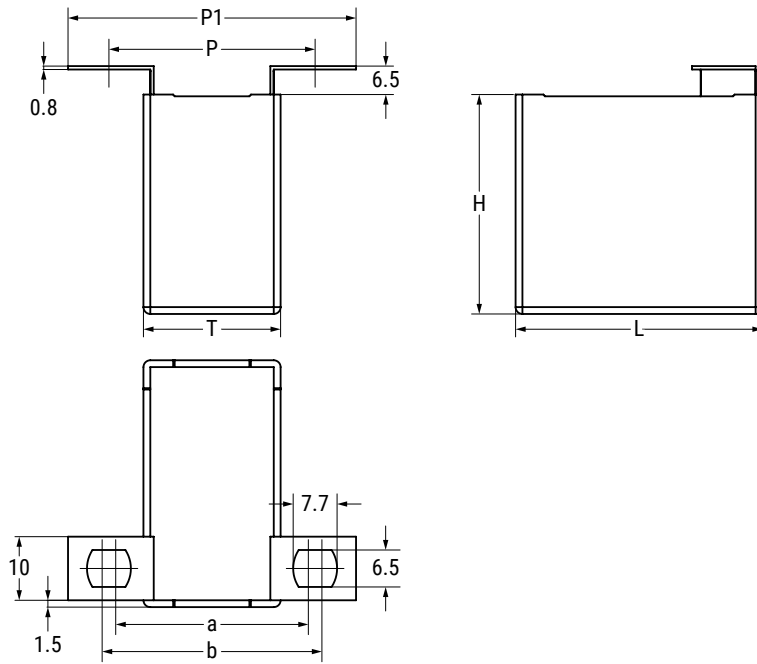


### Style M

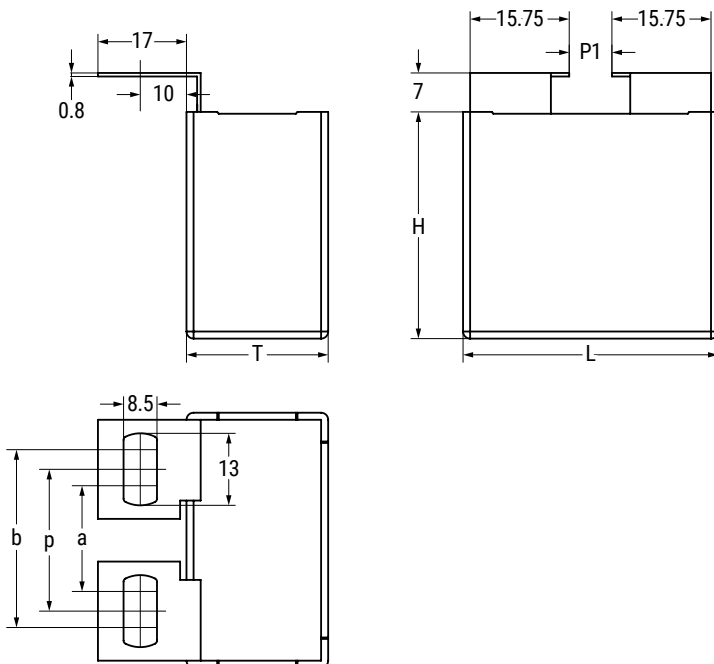


## Dimensions – Millimeters cont.

### Style T

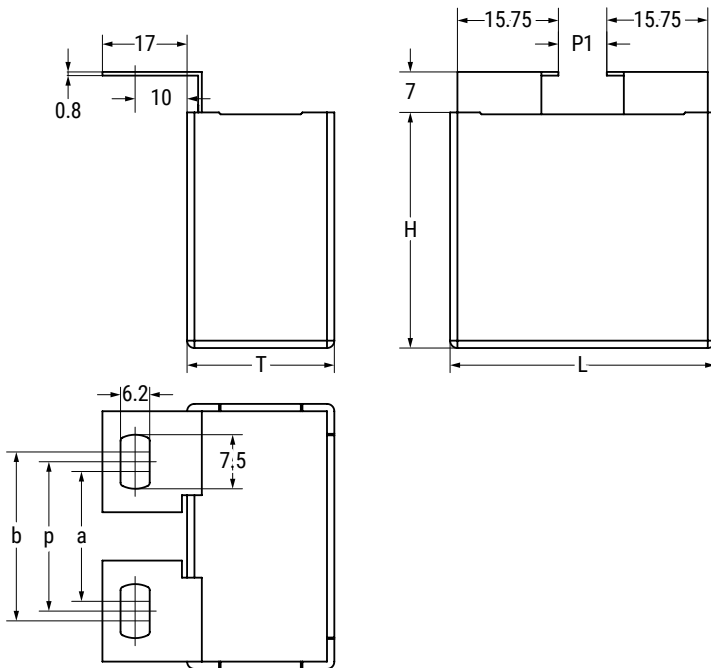


### Style W



## Dimensions – Millimeters cont.

### Style X



Size Code	T		H		L	
	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
F	20	+0.4/-0.7	40	+0.2/-0.7	41.5	+1.5/-0.7
H	24	+0.4/-0.7	44	+0.2/-0.7	41.5	+1.5/-0.7
J	28	+0.4/-0.7	37	+0.2/-0.7	42.5	+1.5/-0.7
L	30	+0.4/-0.7	45	+0.2/-0.7	42.0	+1.5/-0.7
M	30	+0.5/-0.7	45	+0.3/-0.7	57.5	+1.2/-0.7
N	35	+0.5/-0.7	50	+0.3/-0.7	57.5	+1.2/-0.7

Style	Size Code	P	P1	a	b
		±0.2	Nominal	±0.2	±0.2
A, H, M	F, H, J, L	25.5	10.5	21.5	29.5
	M, N	41.0	25.0	37.0	45.0
B, F	F, H, J, L	22.0	6.0	16.0	28.0
	M - N	37.0	21.0	31.0	43.0
G	F, H, J, L	22.0	10.5	4.0	-
	M - N	37.0	25.0	4.0	-
D	F, J, H, L	22.0	6.0	18.0	26.0
	M, N	37.0	21.0	33.0	41.0
W	F, J, H, L	22.0	6.0	17.0	27.0
	M, N	37.0	21.0	32.0	42.0
X	F, J, H, L	22.0	6.0	20.5	23.5
	M, N	37.0	21.0	35.5	38.5
E, T	F	33.0	46.0	31.0	35.0

## 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 Code (15th Digit)	J = ±5%, K = ±10%
Peak Non-Repetitive Maximum Current	$I_{PKR} \times 1.5$
Peak Non-Repetitive Maximum Current	$I_{PKR} \times 1.5$
Test Voltage Terminal to Terminal $V_{TT}$	$2 V_n$ for 10 seconds at +25°C
Dissipation Factor (DF)	$\geq 5 \times 10^{-4}$ at 1 kHz and +20°C
Acceptable Relative Humidity	Annual average $\leq 70\%$ $\leq 85\%$ for $\leq 30$ intermittent days annually Dewing not admissible
IEC Climatic Category	40/85/56 according to IEC 68-1
Capacitance Deviation in Operating Temperature Range of -40°C to +85°C	$\pm 2\%$ maximum on capacitance value measured at +25°C
Change of Capacitance vs. Operating Time	-3% after 100,000 hours at $V_n$ or 30,000 hours at $V_{rms}$
Case Components	Solvent resistant plastic case with epoxy and polyurethanic resin sealing, Flame retardant execution (UL Class 94V-0)
Terminals	Tinned copper wires
Installation	Any position
Life Expectancy	$\geq 100,000$ hours at $V_n$ or 30,000 hours at $V_{rms}$
Failure Quota	300/10 <sup>9</sup> components per hour

**Table 1 – Ratings & Part Number Reference**

Cap Value (µF)	VDC	VAC	Peak VDC	Size Code	Maximum Dimensions (mm)			Ripple Current	Peak Current	ESR (max)	ESL	dV/dt (V/µs)	Packaging Quantity	Part Number
					T	H	L	100 kHz 70°C (A)	(A)	100 kHz (mΩ)	(nH)			
10	250	160	400	F	20	40	41.5	27	402	2.6	41	40	52	C4BTDBX5100Z(1)FJ
10	250	160	400	F	20	40	41.5	27	402	2.6	41	40	48	C4BTDBX5100Z(2)FJ
10	250	160	400	F	20	40	41.5	27	402	2.6	41	40	40	C4BTDBX5100Z(4)FJ
15	250	160	400	F	20	40	41.5	32	602	1.8	41	40	52	C4BTDBX5150Z(1)FJ
15	250	160	400	F	20	40	41.5	32	602	1.8	41	40	48	C4BTDBX5150Z(2)FJ
15	250	160	400	F	20	40	41.5	32	602	1.8	41	40	40	C4BTDBX5150Z(4)FJ
20	250	160	400	J	28	37	42.5	39	803	1.4	36	40	36	C4BTDBX5200Z(3)JJ
25	250	160	400	H	24	44	41.5	43	1004	1.2	43	40	44	C4BTDBX5250Z(1)HJ
25	250	160	400	H	24	44	41.5	43	1004	1.2	43	40	40	C4BTDBX5250Z(2)HJ
30	250	160	400	L	30	45	42	50	1205	1	43	40	32	C4BTDBX5300Z(3)LJ
40	250	160	400	M	30	45	57.5	46	1082	1.5	45	27	24	C4BTDBX5400Z(3)MJ
50	250	160	400	N	35	50	57.5	54	1353	1.2	48	27	21	C4BTDBX5500Z(3)NJ
60	250	160	400	N	35	50	57.5	58	1624	1.1	48	27	21	C4BTDBX5600Z(3)NJ
4	400	250	600	F	20	40	41.5	19	201	4.9	41	50	52	C4BTFBX4400Z(1)FJ
4	400	250	600	F	20	40	41.5	19	201	4.9	41	50	48	C4BTFBX4400Z(2)FJ
4	400	250	600	F	20	40	41.5	19	201	4.9	41	50	40	C4BTFBX4400Z(4)FJ
5	400	250	600	F	20	40	41.5	22	251	4	41	50	52	C4BTFBX4500Z(1)FJ
5	400	250	600	F	20	40	41.5	22	251	4	41	50	48	C4BTFBX4500Z(2)FJ
5	400	250	600	F	20	40	41.5	22	251	4	41	50	40	C4BTFBX4500Z(4)FJ
6.8	400	250	600	F	20	40	41.5	25	341	3	41	50	52	C4BTFBX4680Z(1)FJ
6.8	400	250	600	F	20	40	41.5	25	341	3	41	50	48	C4BTFBX4680Z(2)FJ
6.8	400	250	600	F	20	40	41.5	25	341	3	41	50	40	C4BTFBX4680Z(4)FJ
10	400	250	600	F	20	40	41.5	30	502	2.1	41	50	52	C4BTFBX5100Z(1)FJ
10	400	250	600	F	20	40	41.5	30	502	2.1	41	50	48	C4BTFBX5100Z(2)FJ
10	400	250	600	F	20	40	41.5	30	502	2.1	41	50	40	C4BTFBX5100Z(4)FJ
12.5	400	250	600	J	28	37	42.5	35	627	1.7	36	50	36	C4BTFBX5125Z(3)JJ
15	400	250	600	J	28	37	42.5	38	753	1.5	36	50	36	C4BTFBX5150Z(3)JJ
20	400	250	600	L	30	45	42	46	1004	1.2	43	50	32	C4BTFBX5200Z(3)LJ
25	400	250	600	M	30	45	57.5	41	846	1.8	45	34	24	C4BTFBX5250Z(3)MJ
30	400	250	600	M	30	45	57.5	45	1015	1.6	45	34	24	C4BTFBX5300Z(3)MJ
35	400	250	600	N	35	50	57.5	52	1184	1.4	48	34	21	C4BTFBX5350Z(3)NJ
40	400	250	600	N	35	50	57.5	54	1353	1.2	48	34	21	C4BTFBX5400Z(3)NJ
2.5	600	330	800	F	20	40	41.5	18	176	5.7	41	70	52	C4BTHBX4250Z(1)FJ
2.5	600	330	800	F	20	40	41.5	18	176	5.7	41	70	48	C4BTHBX4250Z(2)FJ
2.5	600	330	800	F	20	40	41.5	18	176	5.7	41	70	40	C4BTHBX4250Z(4)FJ
3	600	330	800	F	20	40	41.5	20	211	4.8	41	70	52	C4BTHBX4300Z(1)FJ
3	600	330	800	F	20	40	41.5	20	211	4.8	41	70	48	C4BTHBX4300Z(2)FJ
3	600	330	800	F	20	40	41.5	20	211	4.8	41	70	40	C4BTHBX4300Z(4)FJ
4	600	330	800	F	20	40	41.5	23	281	3.6	41	70	52	C4BTHBX4400Z(1)FJ
4	600	330	800	F	20	40	41.5	23	281	3.6	41	70	48	C4BTHBX4400Z(2)FJ
4	600	330	800	F	20	40	41.5	23	281	3.6	41	70	40	C4BTHBX4400Z(4)FJ
5	600	330	800	F	20	40	41.5	25	351	2.9	41	70	52	C4BTHBX4500Z(1)FJ
5	600	330	800	F	20	40	41.5	25	351	2.9	41	70	48	C4BTHBX4500Z(2)FJ
5	600	330	800	F	20	40	41.5	25	351	2.9	41	70	40	C4BTHBX4500Z(4)FJ
6.8	600	330	800	J	28	37	42.5	31	478	2.2	41	70	36	C4BTHBX4680Z(3)JJ
8	600	330	800	H	24	44	41.5	34	562	1.9	43	70	44	C4BTHBX4800Z(1)HJ
8	600	330	800	H	24	44	41.5	34	562	1.9	43	70	40	C4BTHBX4800Z(2)HJ
10	600	330	800	L	30	45	42	40	703	1.6	43	70	32	C4BTHBX5100Z(3)LJ
12.5	600	330	800	M	30	45	57.5	35	592	2.5	45	47	24	C4BTHBX5125Z(3)MJ
15	600	330	800	M	30	45	57.5	38	710	2.1	45	47	24	C4BTHBX5150Z(3)MJ
20	600	330	800	N	35	50	57.5	47	947	1.7	48	47	21	C4BTHBX5200Z(3)NJ
Cap Value	VDC	VAC	Peak VDC	Size Code	Maximum Dimensions			Ripple Current	Peak Current	ESR	ESL	dV/dt (V/µs)	Packaging Quantity	Part Number

(1) = Code letter for lug style: A, D, G, H or M  
 (2) = Code letter for lug style: B, E\*, F, W, or X; \* Style E is possible only for size code F  
 (3) = Code letter for lug style: A, B, D, F, G, H, M, W or X  
 (4) = Code letter for lug style: T  
 Capacitance tolerance standard is J, K tolerance upon request.

**Table 1 – Ratings & Part Number Reference cont.**

Cap Value (µF)	VDC	VAC	Peak VDC	Size Code	Maximum Dimensions (mm)			Ripple Current	Peak Current	ESR (max)	ESL	dV/dt (V/µs)	Packaging Quantity	Part Number	
					T	H	L	100 kHz 70°C (A)	(A)	100 kHz (mΩ)	(nH)				
1.5	700	400	1,000	F	20	40	41.5	15	120	8.2	41	80	52	C4BTJBX4150Z(1)FJ	
1.5	700	400	1,000	F	20	40	41.5	15	120	8.2	41	80	48	C4BTJBX4150Z(2)FJ	
1.5	700	400	1,000	F	20	40	41.5	15	120	8.2	41	80	40	C4BTJBX4150Z(4)FJ	
2	700	400	1,000	F	20	40	41.5	17	161	6.2	41	80	52	C4BTJBX4200Z(1)FJ	
2	700	400	1,000	F	20	40	41.5	17	161	6.2	41	80	48	C4BTJBX4200Z(2)FJ	
2	700	400	1,000	F	20	40	41.5	17	161	6.2	41	80	40	C4BTJBX4200Z(4)FJ	
2.2	700	400	1,000	F	20	40	41.5	18	177	5.7	41	80	52	C4BTJBX4220Z(1)FJ	
2.2	700	400	1,000	F	20	40	41.5	18	177	5.7	41	80	48	C4BTJBX4220Z(2)FJ	
2.2	700	400	1,000	F	20	40	41.5	18	177	5.7	41	80	40	C4BTJBX4220Z(4)FJ	
3	700	400	1,000	F	20	40	41.5	21	241	4.2	41	80	52	C4BTJBX4300Z(1)FJ	
3	700	400	1,000	F	20	40	41.5	21	241	4.2	41	80	48	C4BTJBX4300Z(2)FJ	
3	700	400	1,000	F	20	40	41.5	21	241	4.2	41	80	40	C4BTJBX4300Z(4)FJ	
4	700	400	1,000	F	20	40	41.5	24	321	3.2	41	80	52	C4BTJBX4400Z(1)FJ	
4	700	400	1,000	F	20	40	41.5	24	321	3.2	41	80	48	C4BTJBX4400Z(2)FJ	
4	700	400	1,000	F	20	40	41.5	24	321	3.2	41	80	40	C4BTJBX4400Z(4)FJ	
5	700	400	1,000	J	28	37	42.5	29	402	2.6	36	80	36	C4BTJBX4500Z(3)JJ	
8	700	400	1,000	L	30	45	42.0	38	642	1.7	43	80	32	C4BTJBX4800Z(3)LJ	
10	700	400	1,000	M	30	45	57.5	34	541	2.7	45	54	24	C4BTJBX5100Z(3)MJ	
15	700	400	1,000	N	35	50	57.5	44	812	1.9	48	54	21	C4BTJBX5150Z(3)NJ	
1	850	450	1,200	F	20	40	41.5	14	100	9.9	41	100	52	C4BTMBX4100Z(1)FJ	
1	850	450	1,200	F	20	40	41.5	14	100	9.9	41	100	48	C4BTMBX4100Z(2)FJ	
1	850	450	1,200	F	20	40	41.5	14	100	9.9	41	100	40	C4BTMBX4100Z(4)FJ	
1.5	850	450	1,200	F	20	40	41.5	17	151	6.7	41	100	52	C4BTMBX4150Z(1)FJ	
1.5	850	450	1,200	F	20	40	41.5	17	151	6.7	41	100	48	C4BTMBX4150Z(2)FJ	
1.5	850	450	1,200	F	20	40	41.5	17	151	6.7	41	100	40	C4BTMBX4150Z(4)FJ	
2	850	450	1,200	F	20	40	41.5	19	201	5.1	41	100	52	C4BTMBX4200Z(1)FJ	
2	850	450	1,200	F	20	40	41.5	19	201	5.1	41	100	48	C4BTMBX4200Z(2)FJ	
2	850	450	1,200	F	20	40	41.5	19	201	5.1	41	100	40	C4BTMBX4200Z(4)FJ	
3	850	450	1,200	F	20	40	41.5	23	301	3.4	41	100	52	C4BTMBX4300Z(1)FJ	
3	850	450	1,200	F	20	40	41.5	23	301	3.4	41	100	48	C4BTMBX4300Z(2)FJ	
3	850	450	1,200	F	20	40	41.5	23	301	3.4	41	100	40	C4BTMBX4300Z(4)FJ	
4	850	450	1,200	H	24	44	41.5	29	402	2.6	43	100	44	C4BTMBX4400Z(1)HJ	
4	850	450	1,200	H	24	44	41.5	29	402	2.6	43	100	40	C4BTMBX4400Z(2)HJ	
5	850	450	1,200	L	30	45	42	34	502	2.2	43	100	32	C4BTMBX4500Z(3)LJ	
8	850	450	1,200	N	35	50	57.5	37	541	2.8	48	68	21	C4BTMBX4800Z(3)NJ	
10	850	450	1,200	N	35	50	57.5	40	677	2.3	48	68	21	C4BTMBX5100Z(3)NJ	
Cap Value	VDC	VAC	Peak VDC	Size Code	T	H	L	Ripple Current	Peak Current	ESR	ESL	dV/dt (V/µs)	Packaging Quantity	Part Number	
					Maximum Dimensions										

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 (3) = Code letter for lug style: A, B, D, F, G, H, M, W or X  
 (4) = Code letter for lug style: T  
 Capacitance tolerance standard is J, K tolerance upon request.

## 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 datasheets and using specific identifiers on the packaging labels.

All KEMET power film capacitors are RoHS compliant.

## 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  $\tan\delta$  may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

## Sealing

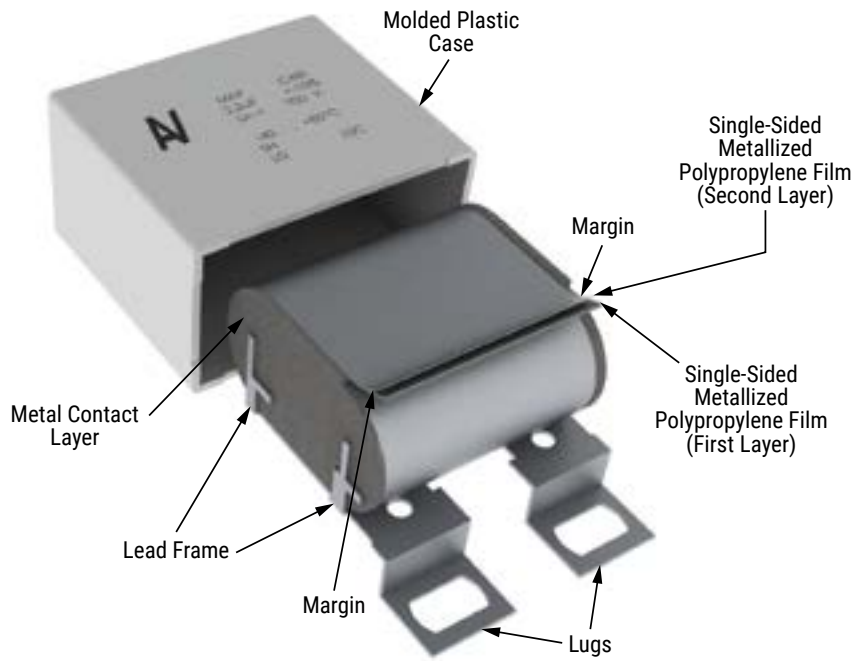
### Hermetically Sealed Capacitors

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.

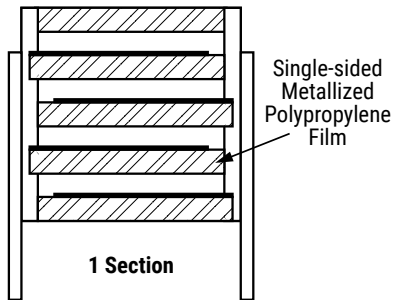
### Barometric Pressure

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  $R\theta^2$  losses and eventual failure can result.

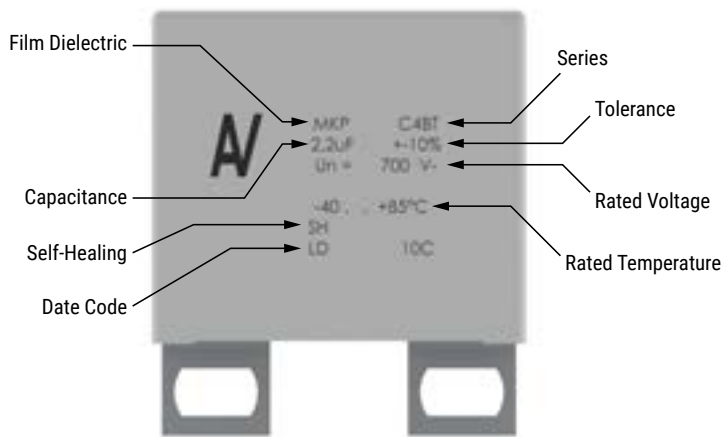
## Construction



## Winding Scheme



## Marking



## KEMET Electronics Corporation Sales Offices

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