

K01 TYPE



- Surge-proof capacitor in aluminium can with insulation sleeve.
 - Poles brought out to heavy duty screw terminals.
 - To be mounted with ring clips or with threaded stud.
- Very high CV for unit volume with low ESR.
High ripple current.
Excellent electricals data in small dimensions case size.

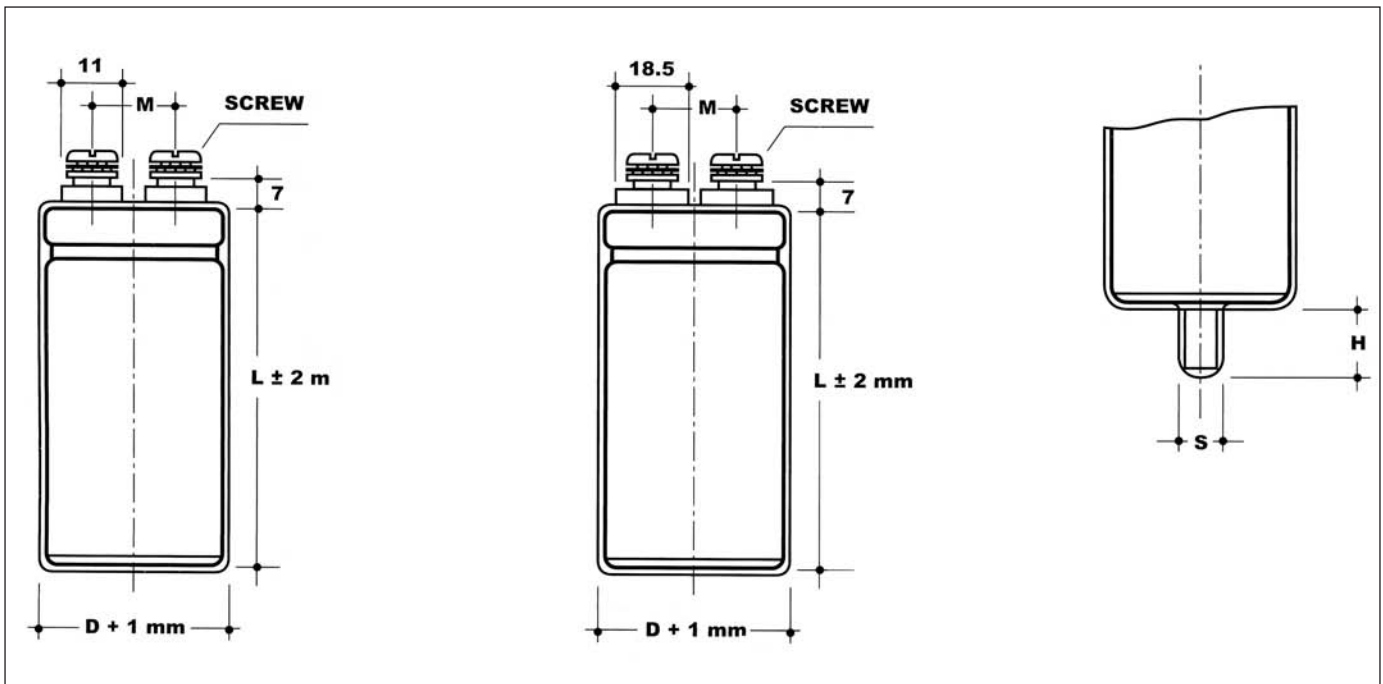
Applications

Designed for professional power electronics. Switch mode power supplies, converters, filtering devices.

RoHS Compliant.

SPECIFICATION

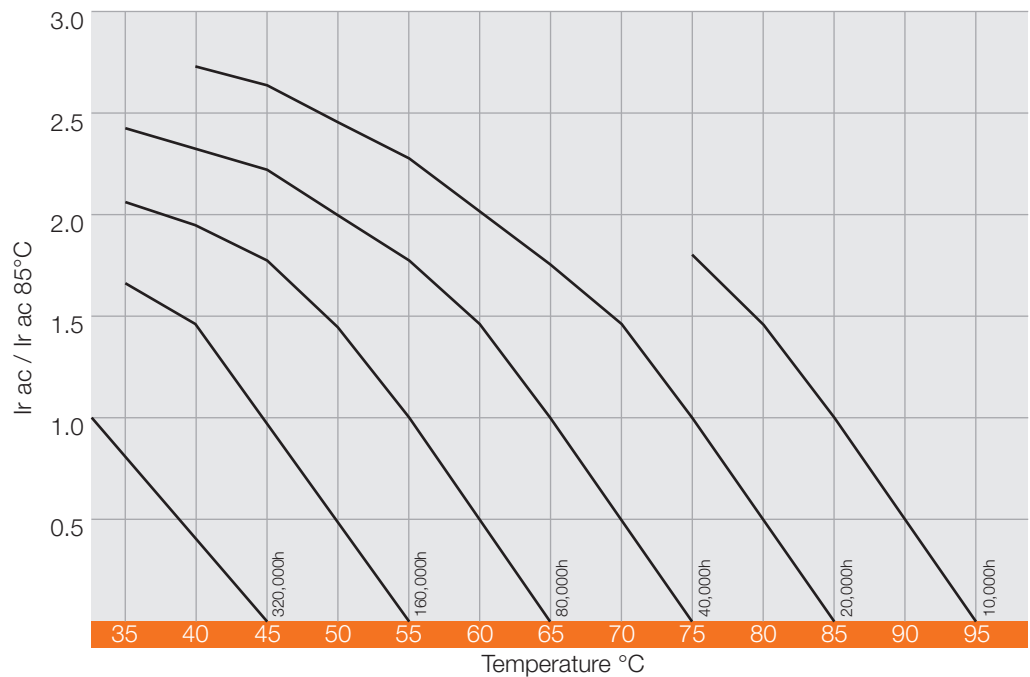
General Characteristics																																									
Temperature Range (V_r)	Operating: -40°C $+85^{\circ}\text{C}$ [Environmental classification 40/85/56 IEC-68] Storage: Preferably below $+25^{\circ}\text{C}$, not exceeding $+40^{\circ}\text{C}$																																								
Rated Voltage Range	From 16V to 500V DC																																								
Surge Voltage (V_p)	$V_p = 1.15 V_r$ ($V_r \leq 250\text{V DC}$) $V_p = 1.10 V_r$ ($V_r > 250\text{V DC}$)																																								
Rated Capacitance Range	From 220 μF to 1,500,000 μF																																								
Capacitance Tolerance	$\pm 20\%$ at 100 Hz, 20°C [M class IEC-62] on request: -10% $+30\%$ at 100 Hz, 20°C [Q class IEC-62]																																								
Leakage Current (I_L) (mA, 5 min, 20°C)	Max $I_L = 0.006 C_r V_r + 4 \mu\text{A}$ Kendeil product limit: $I_L = 0.003 C_r V_r$ At 85°C max $I_L = 0.04 C_r V_r \mu\text{A}$																																								
Ripple Current (I_r)	Refer to table at 85°C and 100 Hz. For different temperature and frequency multiplier must be used as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Frequency</th> <th>50 Hz</th> <th>100 Hz</th> <th>500 Hz</th> <th>1.000 Hz</th> <th>>10k Hz</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.8</td> <td>1.0</td> <td>1.2</td> <td>1.3</td> <td>1.5</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Ambient Temperature</th> <th>35°C</th> <th>45°C</th> <th>55°C</th> <th>65°C</th> <th>75°C</th> <th>85°C</th> <th>95°C</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>2.2</td> <td>2.1</td> <td>1.8</td> <td>1.6</td> <td>1.4</td> <td>1.0</td> <td>0.5</td> </tr> </tbody> </table> Maximum internal temperature 98°C Due to the current load capability of the contact elements, the following limits must not be exceeded: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Capacitor diameter</th> <th>35 mm</th> <th>51 mm</th> <th>63 mm</th> <th>76 mm</th> <th>90 mm</th> </tr> </thead> <tbody> <tr> <td>Maximum current</td> <td>20A</td> <td>30A</td> <td>40A</td> <td>50A</td> <td>70A</td> </tr> </tbody> </table>	Frequency	50 Hz	100 Hz	500 Hz	1.000 Hz	>10k Hz	Multiplier	0.8	1.0	1.2	1.3	1.5	Ambient Temperature	35°C	45°C	55°C	65°C	75°C	85°C	95°C	Multiplier	2.2	2.1	1.8	1.6	1.4	1.0	0.5	Capacitor diameter	35 mm	51 mm	63 mm	76 mm	90 mm	Maximum current	20A	30A	40A	50A	70A
Frequency	50 Hz	100 Hz	500 Hz	1.000 Hz	>10k Hz																																				
Multiplier	0.8	1.0	1.2	1.3	1.5																																				
Ambient Temperature	35°C	45°C	55°C	65°C	75°C	85°C	95°C																																		
Multiplier	2.2	2.1	1.8	1.6	1.4	1.0	0.5																																		
Capacitor diameter	35 mm	51 mm	63 mm	76 mm	90 mm																																				
Maximum current	20A	30A	40A	50A	70A																																				
Insulation Resistance	At 100V DC for 1 min is $>100 \text{ M}\Omega$ across insulating sleeve and terminals.																																								
Vibration Resistance	Frequency range: 10 Hz to 55 Hz, amplitude 0.75 mm Capacitor length ≤ 143 : max acceleration 10g for 3x2 h Capacitor length > 143 : max acceleration 5g for 3x0.5 h																																								
Life Test	After 2,000 hours application of rated voltage at 85°C capacitors meet characteristics aside <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Cap change</td> <td>$\leq 20\%$</td> </tr> <tr> <td>tan δ</td> <td>$\leq 200\%$</td> </tr> <tr> <td>Leakage current (I_L)</td> <td>$<$ initial limit</td> </tr> <tr> <td>Impedance (Z)</td> <td>$\leq 200\%$</td> </tr> </tbody> </table>	Cap change	$\leq 20\%$	tan δ	$\leq 200\%$	Leakage current (I_L)	$<$ initial limit	Impedance (Z)	$\leq 200\%$																																
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Shelf life	After leaving capacitors under no load for 500 hours at 85°C , when restored at 20°C meet specifications aside <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Cap change</td> <td>$\leq \pm 15\%$</td> </tr> <tr> <td>tan δ</td> <td>$\leq 150\%$</td> </tr> <tr> <td>Leakage current (I_L)</td> <td>$<$ initial limit</td> </tr> </tbody> </table>	Cap change	$\leq \pm 15\%$	tan δ	$\leq 150\%$	Leakage current (I_L)	$<$ initial limit																																		
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Leakage current (I_L)	$<$ initial limit																																								
Useful life	$> 200,000$ h at 40°C $> 10,000$ h at 85°C																																								
Failure percentage	$\leq 1\%$ (during useful life)																																								
Failure rate	≤ 40 fit ($40 \cdot 10^{-9}/\text{h}$ (V_r 160V DC)) ≤ 70 fit ($70 \cdot 10^{-9}/\text{h}$ (V_r 160V DC))																																								
Self inductance	Approx. 20 nH																																								
Reference standards	CECC 30.300 IEC 60384-4 LONG LIFE GRADE																																								



DIMENSIONS (mm)

D	L	M	S	H	Screw
35	51	12.7	M 8	12	TC 5MA x 9.5
35	60	12.7	M 8	12	TC 5MA x 9.5
35	79	12.7	M 8	12	TC 5MA x 9.5
35	105	12.7	M 8	12	TC 5MA x 9.5
51	60	22.2	M 12	16	TC 5MA x 9.5
51	79	22.2	M 12	16	TC 5MA x 9.5
51	105	22.2	M 12	16	TC 5MA x 9.5
63	105	28.6	M 12	16	TC 5MA x 9.5
76	105	31.8	M 12	16	TC 5MA x 9.5
76	143	31.8	M 12	16	TC 5MA x 9.5
76	222	31.8	M 12	16	TC 5MA x 9.5
90	222	31.8	M 12	16	TC 6MA x 10

USEFUL LIFE K01



K01 Type Standard Ratings

Rated Voltage V DC	Capacitance μF	$\varnothing \times L$ mm	Tan δ max 100 Hz 20 °C	ESR TYP m Ω 100 Hz 20 °C	Z TYP m Ω 10 kHz 20 °C	I _r a.c. A max 100 Hz 85 °C	Part Number stud and insert style excluded
16V	22.000	35x60	0.35	18	16	6.6	K01016223 M0EH
	33.000	35x60	0.40	15	13	9.2	K01016333 M0EH
	33.000	35x79	0.40	15	13	10.2	K01016333 M0EJ
	47.000	35x79	0.55	13	12	10.8	K01016473 M0EJ
	47.000	51x79	0.55	13	12	12.5	K01016473 M0GJ
	68.000	51x79	0.60	12	11	15.7	K01016683 M0GJ
	100.000	51x79	0.80	10	11	16.5	K01016104 M0GJ
	100.000	51x105	0.80	10	10	18.7	K01016104 M0GL
	150.000	51x105	1.10	10	9	19.5	K01016154 M0GL
	150.000	63x105	1.10	10	9	21.5	K01016154 M0HL
	220.000	63x105	1.50	8	8	22.4	K01016224 M0HL
	330.000	63x105	1.90	8	8	23.3	K01016334 M0HL
	330.000	76x105	1.90	8	8	25.0	K01016334 M0JL
	470.000	76x105	1.90	5	5	28.5	K01016474 M0JL
	470.000	76x143	1.90	5	5	32.0	K01016474 M0JP
	680.000	76x143	2.50	4	4	32.5	K01016684 M0JP
	1.000.000	76x143	2.50	3	3	34.5	K01016105 M0JP
1.500.000	90x222	3.00	3	3	48.7	K01016155 M0LS	
25V	10.000	35x60	0.25	27	21	5.9	K01025103 M0EH
	15.000	35x60	0.28	16	12	9.3	K01025153 M0EH
	22.000	35x79	0.35	18	16	11.8	K01025223 M0EJ
	33.000	35x79	0.40	15	14	12.1	K01025333 M0EJ
	33.000	51x79	0.40	15	14	13.3	K01025333 M0GJ
	47.000	51x79	0.50	12	10	15.7	K01025473 M0GJ
	68.000	51x79	0.60	10	9	16.4	K01025683 M0GJ
	68.000	51x105	0.60	10	9	18.7	K01025683 M0GL
	100.000	63x105	0.70	10	9	21.5	K01025104 M0HL
	150.000	63x105	1.00	9	9	22.0	K01025154 M0HL
	150.000	76x105	1.00	9	9	23.5	K01025154 M0JL
	220.000	76x105	1.50	9	9	24.2	K01025224 M0JL
	220.000	76x143	1.50	9	9	28.5	K01025224 M0JP
	330.000	76x143	2.00	9	9	30.5	K01025334 M0JP
	470.000	76x222	2.00	5	5	35.6	K01025474 M0JS
40V	10.000	35x60	0.20	18	12	6.5	K01040103 M0EH
	15.000	35x60	0.25	13	10	7.4	K01040153 M0EH
	15.000	35x79	0.25	13	10	8.6	K01040153 M0EJ
	22.000	35x79	0.30	16	14	8.9	K01040223 M0EJ
	22.000	51x79	0.30	16	14	10.4	K01040223 M0GJ
	33.000	51x79	0.35	15	13	13.5	K01040333 M0GJ
	47.000	51x79	0.40	10	9	14.2	K01040473 M0GJ
	47.000	51x105	0.40	10	9	15.1	K01040473 M0GL
	47.000	63x105	0.40	10	9	17.6	K01040473 M0HL
	68.000	51x105	0.50	10	8	18.2	K01040683 M0GL
	68.000	63x105	0.50	10	8	19.5	K01040683 M0HL
	100.000	63x105	0.60	9	8	21.2	K01040104 M0HL
	150.000	76x105	0.90	9	8	25.7	K01040154 M0JL
	220.000	76x143	1.00	6	6	31.5	K01040224 M0JP
	330.000	76x222	1.20	5	5	38.5	K01040334 M0JS

K01 Type Standard Ratings

Rated Voltage V DC	Capacitance µF	ØxL mm	Tan δ max 100 Hz 20 °C	ESR TYP m Ω 100 Hz 20 °C	Z TYP m Ω 10 kHz 20 °C	I _{r a.c.} A max 100 Hz 85 °C	Part Number stud and insert style excluded
50V	4.700	35x60	0.20	33	30	5.6	K01050472 M0EH
	6.800	35x60	0.20	25	24	7.0	K01050682 M0EH
	10.000	35x60	0.20	21	20	10.0	K01050103 M0EH
	15.000	35x79	0.25	17	15	11.3	K01050153 M0EJ
	22.000	51x79	0.30	16	13	13.1	K01050223 M0GJ
	33.000	51x105	0.35	15	13	16.0	K01050333 M0GL
	33.000	63x105	0.35	15	13	17.5	K01050333 M0HL
	47.000	51x105	0.40	12	10	16.2	K01050473 M0GL
	47.000	63x105	0.40	12	10	18.3	K01050473 M0HL
	68.000	51x105	0.60	12	9	18.0	K01050683 M0GL
	68.000	76x105	0.60	12	9	22.1	K01050683 M0JL
	100.000	76x105	0.90	8	8	23.8	K01050104 M0JL
	100.000	76x143	0.90	8	8	25.8	K01050104 M0JP
	150.000	76x143	1.00	6	6	31.5	K01050154 M0JP

63V	4.700	35x60	0.15	29	25	6.2	k101063472 M0EH
	6.800	35x60	0.18	21	20	7.0	k101063682 M0EH
	6.800	35x79	0.18	21	20	8.2	k101063682 M0EJ
	10.000	35x79	0.20	21	20	8.7	k101063103 M0EJ
	10.000	51x79	0.20	18	16	10.1	k101063103 M0GJ
	15.000	51x79	0.25	15	13	11.1	k101063153 M0GJ
	22.000	51x79	0.30	13	11	12.4	k101063223 M0GJ
	22.000	51x105	0.30	13	11	14.6	k101063223 M0GL
	33.000	51x105	0.35	11	10	15.6	k101063333 M0GL
	33.000	63x105	0.35	11	10	17.9	k101063333 M0HL
	47.000	51x105	0.45	10	9	15.8	k101063473 M0GL
	47.000	63x105	0.45	11	10	18.8	k101063473 M0HL
	68.000	76x105	0.70	11	10	25.7	k101063683 M0JL
	100.000	76x105	0.70	8	8	31.5	k101063104 M0JL
	100.000	76x143	0.70	8	8	34.5	k101063104 M0JP
150.000	76x143	0.95	6	6	36.1	k101063154 M0JP	

75V	4.700	35x60	0.15	29	25	5.4	K01075472 M0EH
	6.800	35x79	0.18	20	20	8.5	K01075682 M0EJ
	10.000	51x79	0.20	18	16	11.0	K01075103 M0GJ
	15.000	51x105	0.25	15	13	12.7	K01075153 M0GL
	22.000	51x105	0.30	12	11	15.2	K01075223 M0GL
	22.000	63x105	0.30	12	11	15.2	K01075223 M0HL
	33.000	63x105	0.35	11	10	18.5	K01075333 M0HL
	33.000	76x105	0.35	11	10	18.5	K01075333 M0JL
	47.000	76x105	0.45	10	10	22.1	K01075473 M0JL
	47.000	76x143	0.45	10	10	22.1	K01075473 M0JP
	68.000	76x143	0.80	10	10	26.0	K01075683 M0JP
	100.000	76x143	0.95	8	8	34.9	K01075104 M0JP

K01 Type Standard Ratings

Rated Voltage V DC	Capacitance μF	$\varnothing \times L$ mm	Tan δ max 100 Hz 20 °C	ESR TYP m Ω 100 Hz 20 °C	Z TYP m Ω 10 kHz 20 °C	I _r a.c. A max 100 Hz 85 °C	Part Number stud and insert style excluded
100V	1.500	35x60	0.15	84	65	4.0	K01100152 M0EH
	2.200	35x60	0.15	57	47	5.0	K01100222 M0EH
	3.300	35x60	0.15	48	39	5.3	K01100332 M0EH
	3.300	35x79	0.15	48	39	6.8	K01100332 M0EJ
	4.700	35x79	0.15	30	26	7.5	K01100472 M0EJ
	4.700	51x79	0.15	30	26	10.0	K01100472 M0GJ
	6.800	51x79	0.20	23	20	11.1	K01100682 M0GJ
	10.000	51x79	0.20	16	14	11.9	K01100103 M0GJ
	10.000	51x105	0.20	16	14	13.9	K01100103 M0GL
	10.000	63x105	0.20	16	14	14.5	K01100103 M0HL
	15.000	51x105	0.25	13	12	14.8	K01100153 M0GL
	15.000	63x105	0.25	13	12	17.5	K01100153 M0HL
	22.000	63x105	0.25	12	12	18.2	K01100223 M0HL
	33.000	76x105	0.25	10	10	23.1	K01100333 M0JL
	47.000	76x143	0.30	10	9	30.2	K01100473 M0JP
	68.000	76x222	0.30	8	8	36,5	K01100683 M0JS
	100.000	90x222	0.50	6	5	39,5	K01100104 M0LS
160V	1.000	35x79	0.10	98	90	4.0	K01160102 M0EJ
	1.500	51x79	0.10	62	71	5.3	K01160152 M0GJ
	2.200	51x79	0.10	50	43	7.0	K01160222 M0GJ
	3.300	51x105	0.12	35	30	8.6	K01160332 M0GL
	4.700	51x105	0.12	25	25	10.9	K01160472 M0GL
	4.700	63x105	0.12	25	25	10.9	K01160472 M0HL
	6.800	63x105	0.12	20	22	13.0	K01160682 M0HL
	10.000	76x105	0.15	13	12	17.4	K01160103 M0JL
	10.000	76x143	0.15	13	12	17.4	K01160103 M0JP
	15.000	76x143	0.15	13	12	20.9	K01160153 M0JP
	22.000	76x143	0.20	10	10	26.4	K01160223 M0JP
	33.000	76x222	0.20	8	8	34.1	K01160333 M0JS
	200V	680	35x60	0.10	124	119	3.4
1.000		35x79	0.10	86	88	4.2	K01200102 M0GJ
1.500		51x79	0.10	60	63	5.8	K01200152 M0GJ
2.200		51x105	0.10	47	44	7.2	K01200222 M0GL
3.300		51x105	0.12	35	33	9.0	K01200332 M0GL
3.300		63x105	0.12	35	33	9.0	K01200332 M0HL
4.700		51x105	0.12	30	28	11.1	K01200472 M0GL
4.700		63x105	0.12	30	28	11.1	K01200472 M0HL
6.800		63x105	0.12	25	20	13.9	K01200682 M0HL
6.800		76x105	0.12	25	20	13.9	K01200682 M0JL
10.000		76x105	0.15	13	12	15.8	K01200103 M0JL
10.000		76x143	0.15	13	12	18.6	K01200103 M0JP
15.000		76x143	0.18	12	12	21.4	K01200153 M0JP
22.000		76x143	0.18	10	10	28.9	K01200223 M0JP
33.000		76x222	0.22	8	8	36.1	K01200333 M0JS

K01 Type Standard Ratings

Rated Voltage V DC	Capacitance µF	ØxL mm	Tan δ max 100 Hz 20 °C	ESR TYP m Ω 100 Hz 20 °C	Z TYP m Ω 10 kHz 20 °C	I _r a.c. A max 100 Hz 85 °C	Part Number stud and insert style excluded
250V	470	35x60	0.10	211	200	2.8	K01250471 M0EH
	680	35x79	0.10	157	150	3.5	K01250681 M0EJ
	1.000	51x79	0.10	110	95	4.6	K01250102 M0GJ
	1.500	51x105	0.10	74	65	6.1	K01250152 M0GL
	2.200	51x105	0.10	40	36	7.5	K01250222 M0GL
	3.300	51x105	0.12	35	29	9.8	K01250332 M0GL
	3.300	63x105	0.12	35	29	9.8	K01250332 M0HL
	4.700	63x105	0.12	28	25	11.8	K01250472 M0HL
	4.700	76x105	0.12	28	25	13.2	K01250472 M0JL
	6.800	76x105	0.12	25	21	14.1	K01250682 M0JL
	10.000	76x143	0.15	20	19	19.7	K01250103 M0JP
	15.000	76x143	0.15	18	18	21.9	K01250153 M0JP
	22.000	76x222	0.20	12	11	34.2	K01250223 M0JS

350V	470	35x60	0.10	170	136	3.3	K01350471 M0EH
	680	35x79	0.10	108	95	4.0	K01350681 M0EJ
	1.000	51x79	0.10	79	62	5.0	K01350102 M0GJ
	1.000	51x105	0.10	79	62	5.5	K01350102 M0GL
	1.500	51x105	0.10	60	52	7.4	K01350152 M0GL
	2.200	51x105	0.10	44	40	9.0	K01350222 M0GL
	2.200	63x105	0.10	44	40	9.5	K01350222 M0HL
	3.300	63x105	0.12	35	30	10.1	K01350332 M0HL
	3.300	76x105	0.12	35	30	12.8	K01350332 M0JL
	4.700	76x105	0.12	32	25	14.5	K01350472 M0JL
	4.700	76x143	0.12	32	25	17.5	K01350472 M0JP
	5.600	76x143	0.15	25	23	18.5	K01350562 M0JP
	6.800	76x143	0.15	23	21	19.2	K01350682 M0JP
	10.000	76x143	0.15	18	18	23.0	K01350103 M0JP
	10.000	76x222	0.15	16	15	26.6	K01350103 M0JS
	15.000	76x222	0.20	12	12	31.7	K01350153 M0JS
	22.000	90x222	0.25	8	8	35.4	K01350223 M0LS

K01 Type Standard Ratings

Rated Voltage V DC	Capacitance μF	$\varnothing \times L$ mm	Tan δ max 100 Hz 20 °C	ESR TYP m Ω 100 Hz 20 °C	Z TYP m Ω 10 kHz 20 °C	I _r a.c. A max 100 Hz 85 °C	Part Number stud and insert style excluded	
400V	220	35x60	0.10	455	375	2.1	K01400221 M0EH	
	330	35x60	0.10	290	273	2.8	K01400331 M0EH	
	470	35x60	0.10	160	148	3.0	K01400471 M0EH	
	470	35x79	0.10	165	155	3.5	K01400471 M0EJ	
	680	51x79	0.10	120	115	4.7	K01400681 M0GJ	
	680	51x105	0.10	124	120	5.1	K01400681 M0GL	
	1.000	51x79	0.10	105	90	5.8	K01400102 M0GJ	
	1.000	51x105	0.10	110	85	6.3	K01400102 M0GL	
	1.500	51x105	0.10	65	55	7.0	K01400152 M0GL	
	1.500	63x105	0.10	65	55	7.9	K01400152 M0HL	
	2.200	51x105	0.10	50	47	8.3	K01400222 M0GL	
	2.200	63x105	0.10	50	47	9.0	K01400222 M0HL	
	2.200	76x105	0.10	50	47	10.7	K01400222 M0JL	
	3.300	63x105	0.12	35	30	11.0	K01400332 M0HL	
	3.300	76x105	0.12	35	30	13.1	K01400332 M0JL	
	3.300	76x143	0.12	35	30	14.2	K01400332 M0JP	
	4.700	76x105	0.15	30	29	14.9	K01400472 M0JL	
	4.700	76x143	0.15	30	29	18.8	K01400472 M0JP	
	6.800	76x143	0.15	23	22	19.5	K01400682 M0JP	
	10.000	76x222	0.15	20	19	26.0	K01400103 M0JS	
15.000	90x222	0.20	15	12	33.5	K01400153 M0LS		
450V	220	35x60	0.10	360	300	2.0	K01450221 M0EH	
	330	35x60	0.10	240	210	2.8	K01450331 M0EH	
	470	51x79	0.10	200	179	4.0	K01450471 M0GJ	
	680	51x79	0.10	140	128	4.4	K01450681 M0GJ	
	680	51x105	0.10	140	128	5.0	K01450681 M0GL	
	1.000	51x79	0.10	100	88	4.8	K01450102 M0GJ	
	1.000	51x105	0.10	100	88	6.4	K01450102 M0GL	
	1.500	51x105	0.10	67	55	7.1	K01450152 M0GL	
	1.500	63x105	0.10	67	55	8.0	K01450152 M0HL	
	2.200	63x105	0.10	60	55	9.0	K01450222 M0HL	
	2.200	76x105	0.10	60	47	11.2	K01450222 M0JL	
	2.200	76x143	0.10	60	47	12.5	K01450222 M0JP	
	3.300	76x105	0.12	35	30	11.2	K01450332 M0JL	
	3.300	76x143	0.12	35	30	12.9	K01450332 M0JP	
	4.700	76x143	0.15	32	30	15.0	K01450472 M0JP	
	6.800	76x143	0.15	25	22	19.2	K01450682 M0JP	
	10.000	76x222	0.20	20	19	23.1	K01450103 M0JS	
	12.000	76x222	0.25	15	12	29.8	K01450123 M0JS	
	500V	1.000	51x105	0.15	159	145	4.0	K01500102 M0GL
		1.500	63x105	0.15	122	115	5.2	K01500152 M0HL
2.200		76x105	0.15	90	85	7.4	K01500222 M0JL	
2.200		76x143	0.15	90	85	8.2	K01500222 M0JP	
3.300		76x143	0.20	60	58	10.3	K01500332 M0JP	
4.700		76x143	0.20	40	37	11.6	K01500472 M0JP	