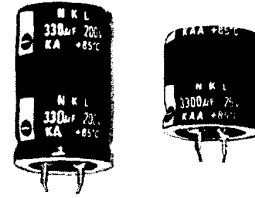


KA – KAA SERIES

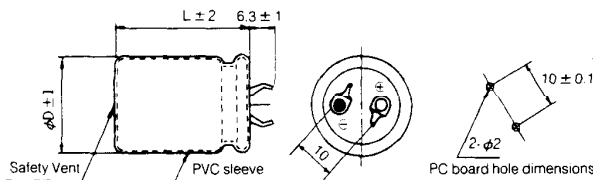
- Large size high capacitance for 85°C use.
- These series feature snap-in terminals to be inserted into PC Boards directly.
- KAA series with low profile.



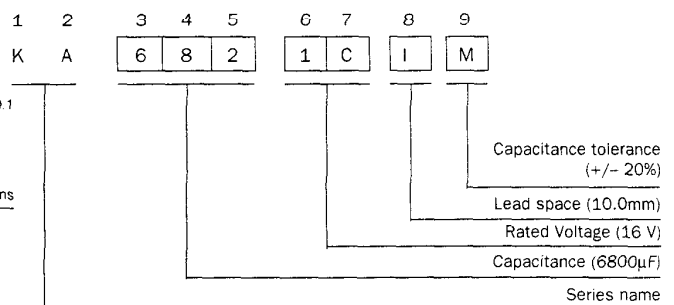
■ SPECIFICATIONS

Item	Characteristics																												
Operating temperature range	-40~ +85°C (10~ 200V), -25~ +85°C (250 ~ 450V)																												
Capacitance tolerance (at 20°C, 120Hz)	+/- 20% at 120Hz, 20°C																												
Leakage Current	10 ~ 100V : I = 0.02CV or 3mA, whichever is smaller 160 ~ 250V : I = 0.03CV 350 ~ 450V : I = 0.06CV + 200 or 5mA, whichever is smaller. Where I : Maximum leakage current (μA) at 20°C (after 5 Minutes) C : Nominal capacitance (μF) V : Rated working voltage (V)																												
Dissipation factor (at 20°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Tan δ (Max.)</td> <td>0.50</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.20</td> <td>0.15</td> <td>0.10</td> <td>0.10</td> <td>0.20</td> <td>0.20</td> </tr> </tbody> </table>	Rated voltage(V)	10	16	25	35	50	63	80	100	160	200	250	400	450	Tan δ (Max.)	0.50	0.50	0.40	0.35	0.30	0.25	0.20	0.20	0.15	0.10	0.10	0.20	0.20
Rated voltage(V)	10	16	25	35	50	63	80	100	160	200	250	400	450																
Tan δ (Max.)	0.50	0.50	0.40	0.35	0.30	0.25	0.20	0.20	0.15	0.10	0.10	0.20	0.20																
Low temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th rowspan="2">Z ratio</th> <th colspan="4">W.V.</th> </tr> <tr> <th>10 ~ 200</th> <th>250</th> <th>315</th> <th>350 ~ 450</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z (20°C)</td> <td>3</td> <td>6</td> <td>12</td> <td>16</td> </tr> <tr> <td>Z(-40°C)/Z (20°C)</td> <td>12</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Z ratio	W.V.				10 ~ 200	250	315	350 ~ 450	Z(-25°C)/Z (20°C)	3	6	12	16	Z(-40°C)/Z (20°C)	12	-	-	-									
Z ratio	W.V.																												
	10 ~ 200	250	315	350 ~ 450																									
Z(-25°C)/Z (20°C)	3	6	12	16																									
Z(-40°C)/Z (20°C)	12	-	-	-																									
Maximum ripple current	Maximum rms ripple current at 85°C, 120Hz is given in the table of STANDARD RATING.																												
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated working voltage applied for 2,000 hours at 85°C. Capacitance change ≤ +/-20% of the initial value. Dissipation factor < 150% of the initial specified value. Leakage current ≤ The initial specified value.																												
Shelf Life	The load life characteristics listed above shall be satisfied when the capacitors are restored to 20°C after exposing them for 1000 hours at 85°C without voltage applied. Rated voltage shall be applied for 30 minutes, at least 24 hours and not more than 48 hours before the measurements.																												
Applicable standards	Satisfies characteristics W of JIS C 5141.																												

Dimensions



Type numbering system (Example: 6800μF 16V)



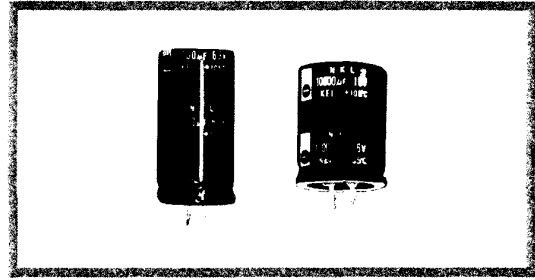
KA – KAA SERIES

■ STANDARD RATINGS

Rated Voltage (V)	Code	Surge Voltage (V)	Capacitance (µF)	Code	K A		K A A	
					Case Size $\phi \times L$ (mm)	Max. ripple current (A rms) at 85°C 120Hz	Case Size $\phi \times L$ (mm)	Max. ripple current (A rms) at 85°C 120Hz
10	1A	13	10000	103	22x25	2.50		
			15000	153	22x30	3.20	25x25	3.10
			22000	223	22x40	4.00	25x35	4.10
16	1C	20	6800	682	22x25	2.40		
			8200	822	22x30	2.50	25x25	2.50
			10000	103	22x35	2.80	25x25	2.85
			15000	153	22x40	2.70	30x25	3.65
			22000	223	25x45	4.80	35x30	4.80
25	1E	32	3300	332	22x25	2.20		
			4700	472	22x30	2.40	25x25	2.40
			6800	682	22x35	2.55	25x25	2.55
			10000	103	22x45	3.40	30x30	3.40
			15000	153	25x45	3.75	35x30	4.45
35	1V	44	2200	222	22x25	2.20		
			3300	332	22x25	2.20		
			4700	472	22x30	2.40	25x25	2.40
			6800	682	22x40	2.95	30x25	2.95
			8200	822	22x45	3.45	30x30	3.45
			10000	103	25x45	4.00	30x35	4.00
50	1H	63	1000	102	22x25	1.20		
			2200	222	22x25	1.90		
			3300	332	22x35	2.36	25x25	2.36
			4700	472	22x40	2.80	30x25	2.80
			6800	682	22x50	3.80	30x35	3.80
			8200	822	25x50	4.30	35x30	4.25
63	1J	79	1000	102	22x25	1.20		
			2200	222	22x30	2.30	25x25	2.30
			3300	332	22x40	2.75	30x25	2.75
			4700	472	22x50	3.30	30x30	3.20
80	1K	100	1000	102	22x25	1.30		
			2200	222	22x40	2.30	30x25	2.30
			3300	332	22x50	2.95	30x30	2.88
			4700	472	25x50	3.75	35x30	3.70
			6800	682	35x50	4.80	35x40	4.80

KE KEL SERIES

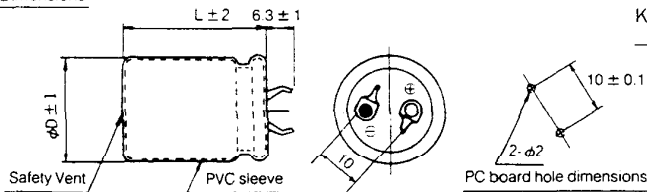
- These series feature snap-in terminals to be inserted in PC Board directly.
- High temperature range -40 (-25)°C to + 105°C.
- High ripple current
- KEL series with low profile.



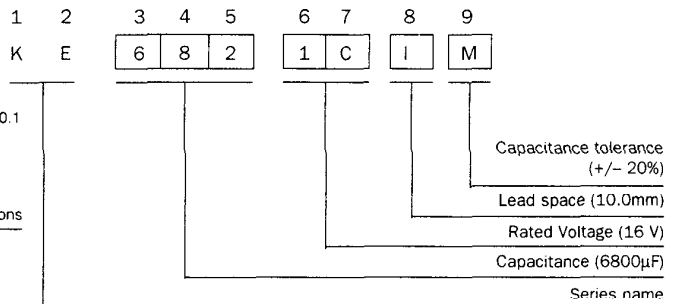
■ SPECIFICATIONS

Item	Characteristics																											
Operating temperature range	-40~ +105°C (10~ 100V), -25~ +105°C (160 ~ 400V)																											
Capacitance tolerance (at 20°C, 120Hz)	+/- 20% at 120Hz, 20°C																											
Leakage Current	I = 0.02CV or 3mA, whichever is smaller (after 5 minutes). Where I : Maximum leakage current (μA) at 20°C C : Nominal capacitance (μF) V : Rated working voltage (V)																											
Dissipation factor (at 20°C, 120Hz)	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63 to 400</td> </tr> <tr> <td>D.F. (tan δ)</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> </tr> </table>	Rated voltage (V)	10	16	25	35	50	63 to 400	D.F. (tan δ)	0.50	0.40	0.30	0.25	0.20	0.15													
Rated voltage (V)	10	16	25	35	50	63 to 400																						
D.F. (tan δ)	0.50	0.40	0.30	0.25	0.20	0.15																						
Low temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <tr> <td rowspan="3">Z ratio</td> <td colspan="6">W.V.</td> </tr> <tr> <td>10.16</td> <td>25</td> <td>35</td> <td>50.63</td> <td>80.100</td> <td>160~ 400</td> </tr> <tr> <td>Z(-25°C)/Z (20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>4</td> </tr> <tr> <td>Z(-40°C)/Z (20°C)</td> <td>15</td> <td>10</td> <td>8</td> <td>6</td> <td>5</td> <td>-</td> </tr> </table>	Z ratio	W.V.						10.16	25	35	50.63	80.100	160~ 400	Z(-25°C)/Z (20°C)	4	3	3	2	2	4	Z(-40°C)/Z (20°C)	15	10	8	6	5	-
Z ratio	W.V.																											
	10.16		25	35	50.63	80.100	160~ 400																					
	Z(-25°C)/Z (20°C)	4	3	3	2	2	4																					
Z(-40°C)/Z (20°C)	15	10	8	6	5	-																						
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated working voltage applied for 2,000 hours at 105°C. Capacitance change ≤ +/-20% of the initial value. Dissipation factor ≤ 200% of the initial specified value. Leakage current ≤ The initial specified value.																											
Shelf Life	The load life characteristics listed above shall be satisfied when the capacitors are restored to 20°C after exposing them for 1000 hours at 105°C without voltage applied. Rated voltage shall be applied for 30 minutes, at least 24 hours and not more than 48 hours before the measurements.																											
Applicable standards	Satisfies characteristics W of JIS C-5141.																											

Dimensions



Type numbering system (Example: 6800μF 16V)





KA – KAA SERIES

■ STANDARD RATINGS

Rated Voltage (V)	Code	Surge Voltage (V)	Capacitance (µF)	Code	KA		KAA	
					Case Size φDxL (mm)	Max. ripple current (A rms) at 85°C 120Hz	Case Size φDxL (mm)	Max. ripple current (A rms) at 85°C 120Hz
100	2A	125	680	681	22x25	1.00		
			820	821	22x25	1.20		
			1000	102	22x30	1.50	25x25	1.50
			2200	222	22x50	2.65	30x30	2.55
160	2C	200	330	331	22x25	1.30		
			470	471	22x35	1.75	25x30	1.75
			680	681	22x40	2.10	30x30	2.20
			820	821	22x50	2.45	35x25	2.45
			1000	102	25x45	2.80	35x30	2.80
200	2D	250	220	221	22x25	1.10		
			330	331	22x30	1.40	25x25	1.40
			470	471	22x40	1.80	30x25	1.80
			680	681	25x40	2.25	35x25	2.30
250	2E	300	820	821	25x50	2.55	35x30	2.50
			100	101	22x25	0.85		
			220	221	22x30	1.15	25x25	1.25
			330	331	22x40	1.45	30x25	1.45
315	2F	365	470	471	22x50	1.90	35x25	1.90
			680	681	30x40	2.40	35x30	2.35
			100	101	22x25	0.65		
			220	221	22x40	1.10	30x25	1.10
350	2V	400	330	331	22x50	1.40	35x30	1.46
			82	820	22x25	0.64		
			100	101	22x25	0.76		
			220	221	22x50	1.20	35x30	1.20
400	2G	450	330	331	25x50	1.60	35x30	1.55
			68	680	22x25	0.58		
			82	820	22x30	0.60	25x25	0.60
			100	101	22x30	0.76	25x25	0.76
450	2W	600	220	221	22x50	1.25	35x30	1.32
			47	470	22x25	0.49		
			68	680	22x30	0.63	25x25	0.63
			82	820	22x35	0.74	25x30	0.75
			100	101	22x40	0.88	30x25	0.86
			220	221	30x45	1.42	35x35	1.40
			330	331	35x45	1.83		

• Frequency coefficient of allowable ripple current

Frequency (Hz)	50	60	120	1k	10k~
16 ~ 100V	0.88	0.90	1.00	1.15	1.15
160 ~ 250V	0.85	0.88	1.00	1.15	1.20
400~450V	0.88	0.90	1.00	1.10	1.15

• Allowable ripple current vs. Ambient temperature

Ambient temp. (°C)	~ +45	+60	+70	+85
Coefficient	1.48	1.42	1.30	1.00



KE KEL SERIES

■ STANDARD RATINGS

Rated Voltage (V)	Code	Capacitance (µF)	Code	KE			KEL		
				Case Size φDxL (mm)	Max. ripple current (A rms)		Case Size φDxL (mm)	Max. ripple current (A rms)	
					85°C, 120 Hz	105°C, 120 Hz		85°C 120 Hz	105°C 120 Hz
10	1A	6800	682	22x25	2.38	1.50		2.38	1.36
		10000	103	22X30	3.20	1.90	25X25	3.19	1.90
		15000	153	22X40	4.17	2.50	35X25	4.44	2.60
		22000	223	30X35	5.53	3.20	35X30	5.65	3.30
16	1C	4700	472	22X25	2.22	1.40		2.22	1.27
		6800	682	22X30	2.74	1.65	25X25	2.94	1.80
		10000	103	22X35	3.81	2.90	30X25	3.76	2.20
		15000	153	22X50	5.10	2.92	30X30	4.99	2.85
25	1E	22000	223	25X50	7.05	3.75	35X30	6.40	3.70
		3300	332	22X25	2.15	1.30		2.15	1.23
		4700	472	22X30	2.84	1.62	25X25	2.82	1.61
		6800	682	22X35	3.62	2.07	25X30	3.59	2.05
35	1V	10000	103	22X50	4.81	2.60	30X30	4.69	2.68
		15000	153	30X40	6.72	3.25	35X35	6.09	3.48
		2200	222	22X25	1.92	1.10		1.92	1.10
		3300	332	22X30	2.61	1.49	25X25	2.59	1.48
50	1H	4700	472	22X35	3.31	1.89	25X30	3.25	1.86
		6800	682	22X45	4.34	2.45	30X30	4.24	2.42
		10000	103	25X50	6.00	3.43	35X35	5.44	3.20
		1500	152	22x25	1.77	1.20		1.77	1.01
63	1J	2200	222	22x30	2.38	1.36	25x25	2.36	1.35
		3300	332	22x35	3.08	1.85	25x30	3.05	1.85
		4700	472	22x45	4.04	2.31	30x30	3.94	2.25
		6800	682	25x50	5.53	3.30	35x30	5.00	3.25
80	1K	1000	102	22x25	1.56	1.10		1.56	0.89
		1500	152	22x30	2.12	1.21	25x25	2.10	1.30
		2200	222	22x35	2.73	1.60	25x30	2.69	1.54
		3300	332	22x50	3.64	2.15	30x30	3.73	2.13
80	1K	4700	472	25x50	4.97	2.75	35x30	5.10	2.70
		680	681	22x25	1.35	0.77		1.35	0.77
		1000	102	22x30	1.80	1.20	25x25	1.80	1.20
		1500	152	22x35	2.36	1.70	30x30	2.50	1.65
		2200	222	22x45	3.12	1.80	30x30	3.19	1.75

KE KEL SERIES

■ STANDARD RATINGS

Rated Voltage (V)	Code	Capacitance (μF)	Code	Case Size φDxL (mm)	KE		KEL		
					Max. ripple current (A rms)		Case Size φDxL (mm)	Max. ripple current (A rms)	
					85°C, 120 Hz	105°C, 120 Hz		85°C 120 Hz	105°C 120 Hz
100	2A	470	471	22x25	1.17	0.85		1.17	0.67
		680	681	22x30	1.56	0.95	25x25	1.56	0.95
		1000	102	22x35	2.01	1.20	25x30	2.15	1.20
		1500	152	22x50	2.91	1.70	30x30	2.76	1.65
160	2C	220	221	22x25	0.91	0.75		0.91	0.75
		330	331	22x30	1.34	1.00	25x25	1.32	0.96
		470	471	22x40	1.55	1.20	25x30	1.38	1.25
		680	681	22x50	2.02	1.65	35x25	1.79	1.60
200	2D	150	151	22x25	0.89	0.60		0.89	0.51
		220	221	22x25	1.08	0.80		1.08	0.61
		330	331	22x35	1.48	1.05	25x30	1.39	1.05
		470	471	22x45	1.83	1.30	30x30	1.79	1.35
250	2E	680	681	25x50	2.37	1.70	35x30	2.50	1.70
		100	101	22x25	0.72	0.45		0.72	0.41
		150	151	22x30	0.95	0.65	25x25	0.95	0.65
		220	221	22x35	1.11	0.85	30x25	1.11	0.85
		330	331	22x45	1.46	1.10	30x30	1.46	1.10
		470	471	25x45	1.83	1.30	35x30	1.83	1.30
315	2F	82	820	22x25	0.70	0.43		0.70	0.40
		100	101	22x35	0.82	0.52	25x30	0.82	0.47
		150	151	22x35	0.93	0.61	25x30	0.93	0.53
		220	221	22x45	1.44	1.02	25x35	1.44	0.82
350	2V	330	331	25x50	1.87	1.33	30x35	1.87	1.33
		68	680	22x25	0.63	0.43		0.63	0.36
		82	820	22x25	0.75	0.47		0.75	0.43
		150	151	22x40	1.09	0.82	30x25	1.08	0.82
400	2G	220	221	22x50	1.44	0.89	25x40	1.49	0.89
		47	470	22x25	0.53	0.20		0.53	0.30
		68	680	22x30	0.68	0.39	25x25	0.68	0.39
		100	101	22x40	0.86	0.55	30x25	0.75	0.53
		220	221	25x50	1.52	0.89	35x35	1.52	0.90

• Frequency coefficient of allowable ripple current

Frequency (Hz)	50	120	1k	10k	50k
10~ 50V	0.95	1	1.05	1.08	1.08
63 ~ 100V	0.92	1	1.13	1.19	1.20
160 ~ 250V	0.81	1	1.32	1.45	1.50
315 ~ 400V	0.77	1	1.30	1.41	1.43

• Allowable ripple current vs. Ambient temperature

Ambient temp (°C)	45	65	85	105
Coefficient	2.40	2.27	1.75	1.00