



V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS

KL 5000 Hours Load Life

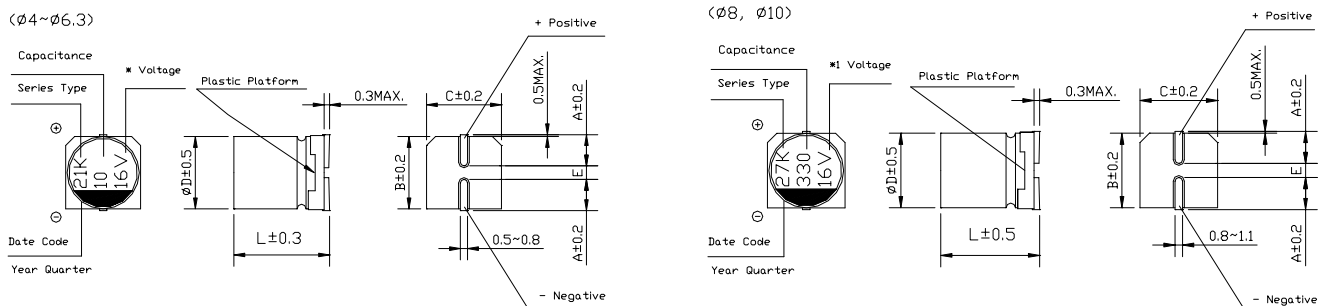
- Chip type, with load life of 5000 hours, temperature range up to +105°C.
- Lead free reflow soldering is available subject to customer's request.



◆ Specifications

Items	Performance Characteristics																										
Operating Temperature Range	-40~+105°C																										
Voltage Range	4~50V																										
Capacitance Range	0.1~1000 μF																										
Capacitance Tolerance	±20% at 120 Hz, 20°C																										
Leakage Current	After 2 minutes application of rated voltage, leakage current is not more than 0.01CV or 3 μA, whichever is greater.																										
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Tan δ (max)</td> <td>0.37</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.13</td> <td>0.12</td> </tr> </tbody> </table>	Rated voltage(V)	4	6.3	10	16	25	35	50	Tan δ (max)	0.37	0.28	0.24	0.20	0.16	0.13	0.12										
Rated voltage(V)	4	6.3	10	16	25	35	50																				
Tan δ (max)	0.37	0.28	0.24	0.20	0.16	0.13	0.12																				
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <thead> <tr> <th colspan="2">Rated voltage(V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio</td> <td>Z-25°C/Z+20°C</td> <td>8</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT/Z20 (max)</td> <td>14</td> <td>10</td> <td>7</td> <td>5</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated voltage(V)		4	6.3	10	16	25	35	50	Impedance ratio	Z-25°C/Z+20°C	8	4	3	2	2	2	2	ZT/Z20 (max)	14	10	7	5	3	3	3
Rated voltage(V)		4	6.3	10	16	25	35	50																			
Impedance ratio	Z-25°C/Z+20°C	8	4	3	2	2	2	2																			
	ZT/Z20 (max)	14	10	7	5	3	3	3																			
Load Life	After 5000 hours' application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±30% of initial value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> <tr> <td>Tan δ</td> <td>300% or less of initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±30% of initial value	Leakage Current	Initial specified value or less	Tan δ	300% or less of initial specified value																				
Capacitance Change	Within ±30% of initial value																										
Leakage Current	Initial specified value or less																										
Tan δ	300% or less of initial specified value																										
Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above.																										
Resistance to Soldering Heat	After reflow soldering according to Reflow Soldering Condition (see page 7 and 8) and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>Initial specified value or less</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </tbody> </table>	Capacitance Change	Within ±10% of initial value	Tan δ	Initial specified value or less	Leakage Current	Initial specified value or less																				
Capacitance Change	Within ±10% of initial value																										
Tan δ	Initial specified value or less																										
Leakage Current	Initial specified value or less																										
Applicable Standards	JIS C-5141 and JIS C-5102																										

◆ Dimensions & Marking



* Voltage mark for 6.3V is [6V]
 Re: Date code and series type —
 1st digit for Year;
 2nd digit for Quarter, 4 quarter
 date-code in one year: 1, 4, 7, 0;
 3rd character for Series, KL
 Series = K.

	(mm)					
φ D×L	4×5.8	5×5.8	6.3×5.8	6.3×7.7	8×10.5	10×10.5
A	1.8	2.1	2.4	2.4	2.9	3.2
B	4.3	5.3	6.6	6.6	8.3	10.3
C	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10.5	10.5



V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS

KL Series

◆ Standard ratings & Maximum permissible ripple current

Cap. (μ F) \diagdown WV		4		6.3		10		16	
		0G		0J		1A		1C	
10	100							4×5.8	18
22	220	4×5.8	22	4×5.8	22	5×5.8	27	5×5.8	30
33	330	5×5.8	30	5×5.8	30	5×5.8	35	6.3×5.8	40
47	470	5×5.8	36	5×5.8	36	6.3×5.8	46	6.3×5.8	50
100	101	6.3×5.8	60	6.3×5.8	60	6.3×7.7	60	6.3×7.7	60
150	151	6.3×7.7	60	6.3×7.7	60	8×10.5	140	8×10.5	140
220	221	6.3×7.7	60	8×10.5	140	8×10.5	140	10×10.5	315
330	331	8×10.5	140	8×10.5	140	10×10.5	315	10×10.5	315
470	471	8×10.5	140	10×10.5	315	10×10.5	315		
680	681	10×10.5	315	10×10.5	315				
1000	102	10×10.5	315						

Cap. (μ F) \diagdown WV		25		35		50	
		1E		1V		1H	
0.1	0R1					4×5.8	1.0
0.22	R22					4×5.8	2.6
0.33	R33					4×5.8	3.2
0.47	R47					4×5.8	3.8
1	010					4×5.8	6.2
2.2	2R2					4×5.8	11
3.3	3R3					4×5.8	14
4.7	4R7	4×5.8	13	4×5.8	15	5×5.8	19
10	100	5×5.8	23	5×5.8	25	6.3×5.8	30
22	220	6.3×5.8	38	6.3×5.8	42	6.3×7.7	60
33	330	6.3×5.8	48	6.3×7.7	60	8×10.5	140
47	470	6.3×7.7	60	8×10.5	140	10×10.5	315
100	101	8×10.5	140	10×10.5	315	10×10.5	315
150	151	10×10.5	315	10×10.5	315	Case size	Allowable ripple
220	221	10×10.5	315				

Allowable Ripple (mA rms) at 105°C 120Hz

◆ Frequency coefficient of allowable ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz~
Coefficient	0.70	1.00	1.17	1.36	1.50