

JOEMASTER



Chip Aluminum Electrolytics

BREL International

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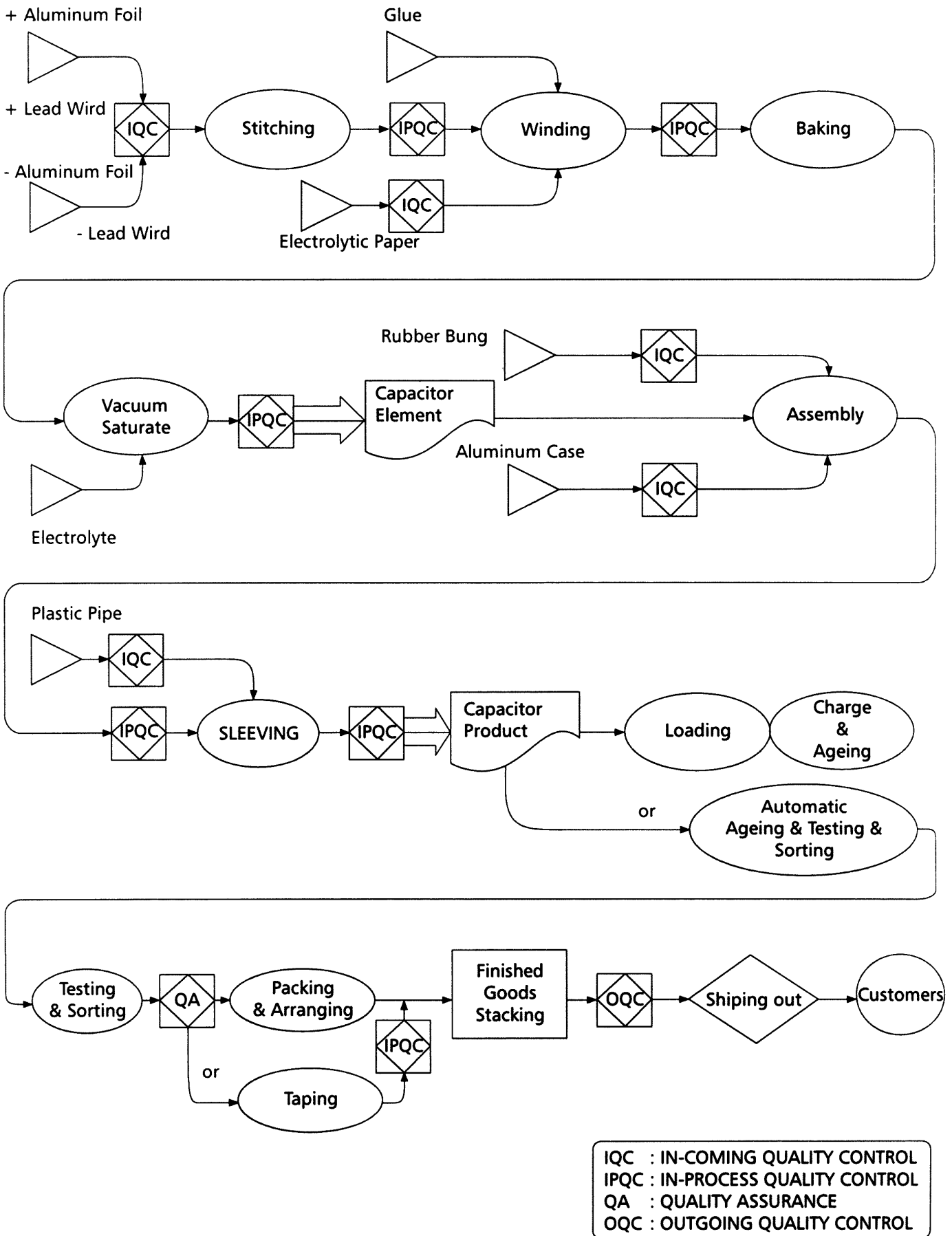


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PRECAUTIONS IN USING ALUMINUM ELECTROLYTIC CAPACITORS

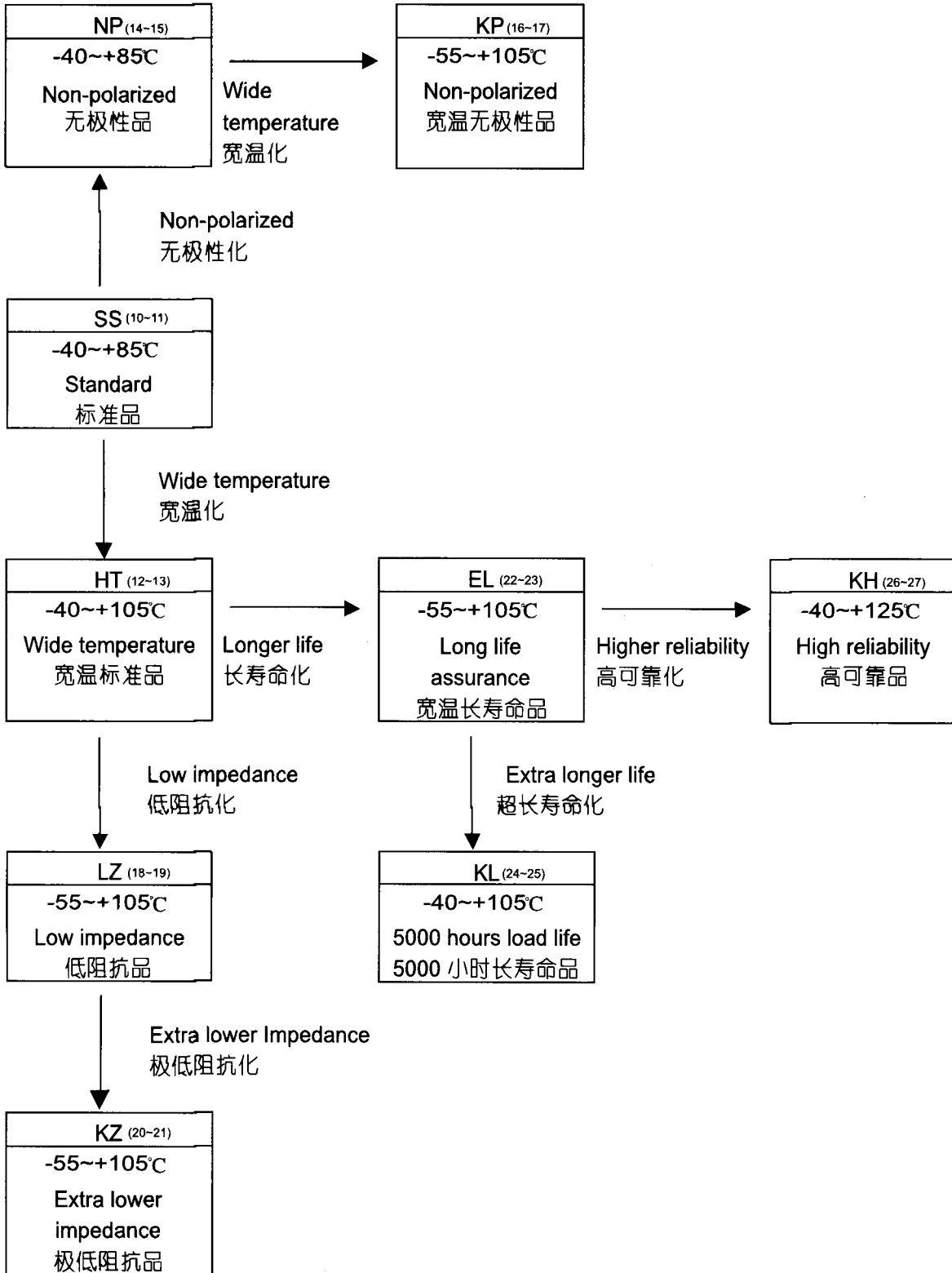
1. If circuit polarity is unclear or uncertain, then Non-polars are recommended.
2. Non-polar capacitors can be used for both AC or DC circuits.
3. DC Electrolytic Capacitors are used for DC applications only, Polarities are marked with " - " on the proper side of wire/terminal.
4. Capacitors should be stored in cool and dry locations.
5. Capacitors shouldn't be applied at the environment temperature that exceed the specified operating temperature.
6. Capacitors are designed to operate within permissible ripple current indicated in the Catalog. Higher range ripple current required, please contact us for details.
7. Must ageing again before using capacitor when the capacitors have been stored for over 6 months.
8. Capacitors are not suitable for sudden charge and discharge conditions.
9. Applied working voltage to capacitors should not exceed the rated working voltage of capacitor.
10. Excessive force to lead wire / terminal is not allowed. (Ref. (JIS-C-5102))
11. Soldering irons should be kept away from the Vinyl sleeve of capacitor to avoid causing the sleeve welding.
12. For soldering process, the solder temperature shouldn't over 260°C for 10 seconds to the capacitors.
13. To protect the sleeve not to be corroded or damaged from cleaning process, please avoid using the Chemical Liquid such as Trichloroethene, xylene or acetone etc.
14. Su'scon products meet or exceed quality standards specified by JIS-C-5141W.
15. Su'scon capacitors comply with the reliability requirements set forth by JIS-C-5102.

AUTOMATIC PRODUCTION FLOW CHART



PRODUCT SYSTEM DIAGRAM

产品体系图



PRODUCT SERIES

主要产品系列

Series 系列	Applications 用途	Operating Temperature (°C) 使用温度	Working Voltage (V) 额定工作电压	Capacitance (μ F) 电容量	Capacitance Tolerance (%) 容量允许偏差	Page 页码
SS	Standard 标准品	-40~+85	4~100	0.1~1500	± 20	10~11
HT	Wide temperature 宽温标准品	-40~+105	4~50	0.1~1000	± 20	12~13
NP	Non-polarized 无极性品	-40~+85	6.3~50	0.1~100	± 20	14~15
KP	Non-polarized with wide temperature 宽温无极性品	-55~+105	6.3~50	0.1~47	± 20	16~17
LZ	Low impedance 低阻抗品	-55~+105	6.3~35	1~220	± 20	18~19
KZ	Extra lower impedance 极低阻抗品	-55~+105	6.3~50	1~1000	± 20	20~21
EL	Long life assurance 宽温长寿命品	-55~+105	6.3~50	0.1~1000	± 20	22~23
KL	5000 hours load life 5000 小时长寿命品	-40~+105	4~50	0.1~1000	± 20	24~25
KH	High reliability 高可靠品	-40~+125	10~50	10~330	± 20	26~27

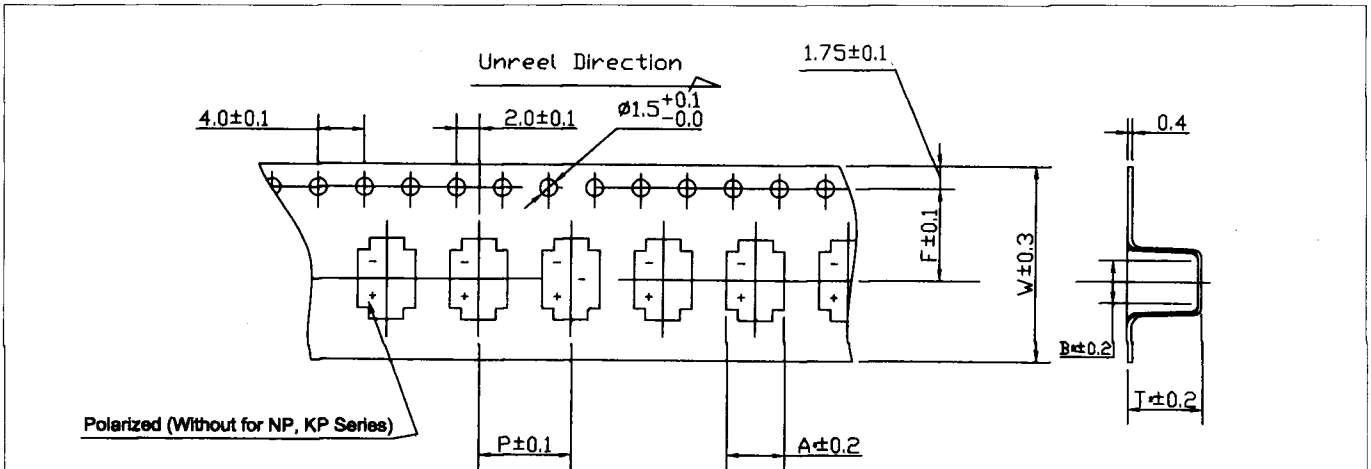
V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

• Taping Specification 编带标准

• Applicable standard JIS C0806

(SS, HT, NP, KP, LZ, KZ, EL, KL, KH series)

• Carrier Tape 袋带

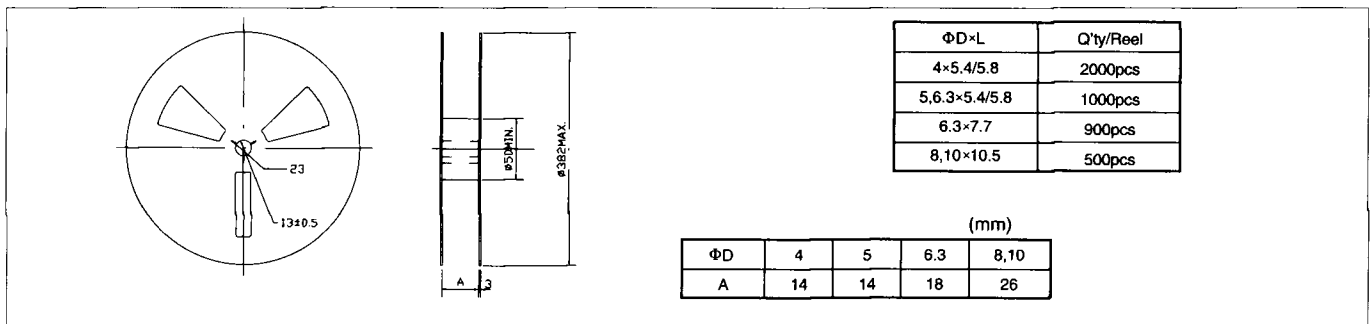


Dimension 尺寸

(mm)

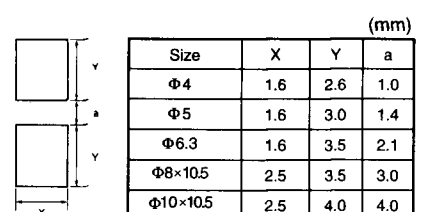
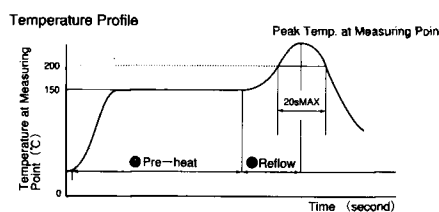
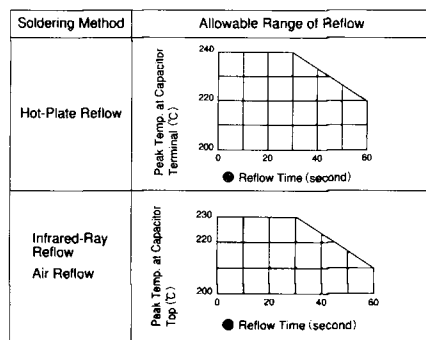
Series	SS	HT	NP	LZ	KP	EL	KZ	KL	SS	HT	NP	LZ	KZ	EL	KL	KH
ΦD×L	4×5.4	5×5.4	6.3×5.4	4×5.8	5×5.8	6.3×5.8	6.3×7.7	8×10.5	10×10.5							
W	12.0	12.0	16.0	12.0	12.0	16.0	16.0	24.0	24.0							
P	8.0	12.0	12.0	8.0	12.0	12.0	12.0	16.0	16.0							
F	5.5	5.5	7.5	5.5	5.5	7.5	7.5	11.5	11.5							
A ₀	5.0	6.0	7.0	5.0	6.0	7.0	7.0	8.7	10.7							
B ₀	5.0	6.0	7.0	5.0	6.0	7.0	7.0	8.7	10.7							
T ₁	5.8	5.8	5.8	6.3	6.3	6.3	8.4	11.0	11.0							

• Reel 卷盘



• Soldering Method and Allowable Range of Reflow

• Recommended Land Size

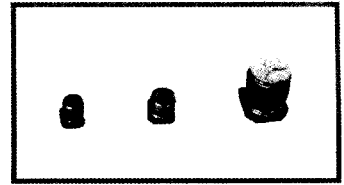


Pre-heating shall be done less than +150°C and 90 seconds, respectively.
 The temperature at capacitor top shall not exceed +230°C.
 The duration for over +200°C temperature at capacitor top shall not exceed 20 seconds.
 The standard temperature profile differs by every reflow method.
 If capacitors are subject to the conditions other than the allowable range of reflow, please contact us.

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

SS Standard Series

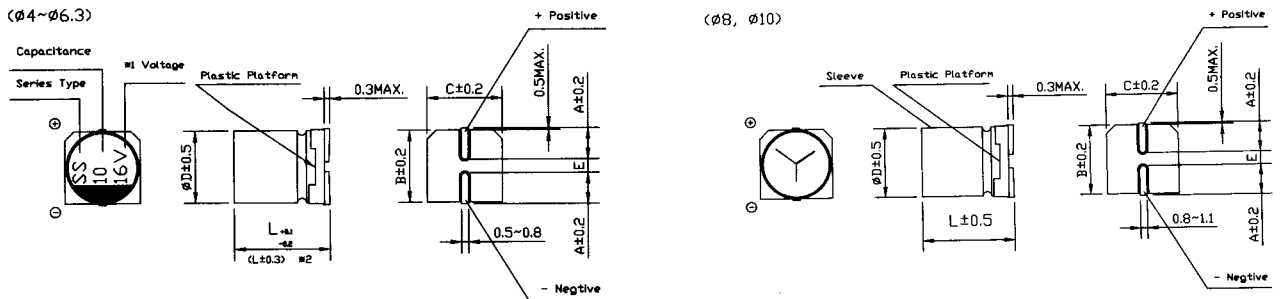
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.



◆ Specifications

Items	Performance Characteristics																														
Operating Temperature Range	-40~85°C																														
Voltage Range	4~100V																														
Capacitance Range	0.1~1500μF																														
Capacitance Tolerance	±20% at 120Hz, 20°C																														
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater.																														
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.35</td> <td>0.26</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </table>	Rated voltage(V)	4	6.3	10	16	25	35	50	63	100	Tan δ (max)	0.35	0.26	0.20	0.16	0.14	0.12	0.12	0.10	0.08										
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Tan δ (max)	0.35	0.26	0.20	0.16	0.14	0.12	0.12	0.10	0.08																						
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td>Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Impedance ratio</td> <td>Z-25°C/Z+20°C</td> <td>7</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT/Z20(max)</td> <td>Z-40°C/Z+20°C</td> <td>15</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)	4	6.3	10	16	25	35	50	63	100	Impedance ratio	Z-25°C/Z+20°C	7	4	3	2	2	2	2	2	ZT/Z20(max)	Z-40°C/Z+20°C	15	8	6	4	4	3	3	3
Rated voltage(V)	4	6.3	10	16	25	35	50	63	100																						
Impedance ratio	Z-25°C/Z+20°C	7	4	3	2	2	2	2	2																						
ZT/Z20(max)	Z-40°C/Z+20°C	15	8	6	4	4	3	3	3																						
Load Life	After 2000 hours' application of rated voltage at 85°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 20% of initial value (Within ± 25% of initial value for 4V)</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ± 20% of initial value (Within ± 25% of initial value for 4V)	Tan δ	200% or less of initial specified value	Leakage Current	Initial specified value or less																								
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Tan δ	200% or less of initial specified value																														
Leakage Current	Initial specified value or less																														
Self Life	After leaving capacitors under no load at 85°C for 1000 hours, they meet the specified value for load life characteristics listed above.																														
Resistance to Soldering Heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </table>	Capacitance Change	Within ± 10% of initial value	Tan δ	Initial specified value or less	Leakage Current	Initial specified value or less																								
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Tan δ	Initial specified value or less																														
Leakage Current	Initial specified value or less																														
Applicable Standards	JIS C-5141 and JIS C-5102																														

◆ Chip Type



*1 Voltage mark for 6.3V is [6V]
 *2 Applicable to 6.3 × 7.7

	(mm)					
ΦD × L	4 × 5.4	5 × 5.4	6.3 × 5.4	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	5.4	5.4	5.4	7.7	10.5	10.5

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

SS Series

◆ Dimensions

Cap. (μ F)	WV	4		6.3		10		16		25	
		0G		0J		1A		1C		1E	
4.7	4R7										4×5.4 19
10	100							4×5.4	25	5×5.4 (4×5.4)	28 (24)
15	150							4×5.4	28	5×5.4	34
22	220			4×5.4	31	5×5.4 (4×5.4)	35 (30)	5×5.4	39	6.3×5.4 (5×5.4)	52 (46)
33	330	4×5.4	28	5×5.4 (4×5.4)	39 (34)	5×5.4 (4×5.4)	43 (35)	6.3×5.4 (5×5.4)	57 (45)	6.3×5.4	63
47	470	4×5.4	33	5×5.4	47	6.3×5.4 (5×5.4)	52 (47)	6.3×5.4	68	6.3×5.4	68
56	560	4×5.4	39	5×5.4	54	6.3×5.4	68	6.3×5.4	74	6.3×5.4	82
68	680	5×5.4	45	6.3×5.4	62	6.3×5.4	72	6.3×5.4	80	6.3×5.4	94
100	101	5×5.4	56	6.3×5.4	71	6.3×5.4	76	6.3×5.4	86	6.3×7.7	145
150	151	6.3×5.4	74	6.3×5.4	78	6.3×5.4	88	6.3×7.7	150	8×10.5	190
220	221	6.3×5.4	96	6.3×5.4	95	6.3×7.7	170	6.3×7.7	160	8×10.5	230
330	331	6.3×7.7	150	6.3×7.7	190	8×10.5	250	8×10.5	280	10×10.5	305
470	471	6.3×7.7	200	8×10.5	270	8×10.5	300	10×10.5	330		
680	681	8×10.5	285	8×10.5	320	10×10.5	380	10×10.5	390		
1000	102	8×10.5	340	10×10.5	400	10×10.5	450				
1500	152	10×10.5	390								

Cap. (μ F)	WV	35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4×5.4	1.0	4×5.4	1.0		
0.22	R22			4×5.4	2.3	4×5.4	2.3		
0.33	R33			4×5.4	3.5	4×5.4	3.5		
0.47	R47			4×5.4	5.0	4×5.4	5.0		
1	010			4×5.4	10	4×5.4	10	4×5.4	10
1.5	1R5			4×5.4	12	4×5.4	12	6.3×5.4	15
2.2	2R2			4×5.4	15	4×5.4	15	6.3×5.4	20
3.3	3R3	4×5.4	18	4×5.4	18	4×5.4	20	6.3×5.4	28
4.7	4R7	4×5.4	20	5×5.4 (4×5.4)	23 (19)	5×5.4	23	6.3×5.4	35
10	100	5×5.4 (4×5.4)	30 (25)	6.3×5.4	34	6.3×5.4	34	6.3×7.7	50
22	220	6.3×5.4	54	6.3×5.4	45	6.3×7.7	70	8×10.5	120
33	330	6.3×5.4	60	6.3×7.7	85	6.3×7.7	85	10×10.5	190
47	470	6.3×5.4	70	6.3×7.7	90	8×10.5	170		
56	560	6.3×7.7	80	6.3×7.7	110	8×10.5	200		
68	680	6.3×7.7	110	8×10.5	170	10×10.5	230		
100	101	6.3×7.7	130	8×10.5	200	10×10.5	280		
150	151	8×10.5	215	10×10.5	240				
220	221	10×10.5	270					Case size	Allowable ripple

() Smaller can size is available

Allowable ripple (mA rms) at 85°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

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

HT Series Wide Temperature

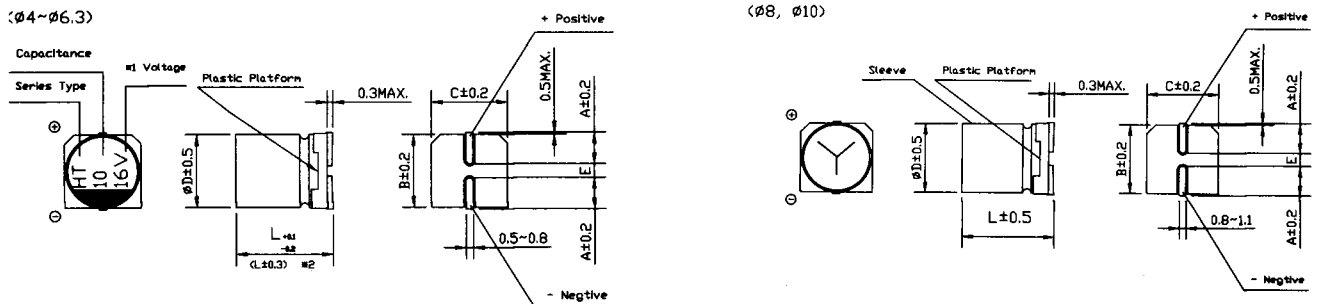
- Chip type, operating with wide temperature range -40~+105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.



Specifications

Items	Performance Characteristics																										
Operating Temperature Range	-40~+105°C																										
Voltage Range	4~50V																										
Capacitance Range	0.1~1000μF																										
Capacitance Tolerance	±20% at 120Hz, 20°C																										
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater.																										
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.35</td> <td>0.26</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> </tr> </table>	Rated voltage(V)	4	6.3	10	16	25	35	50	Tan δ (max)	0.35	0.26	0.20	0.16	0.14	0.12	0.12										
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Tan δ (max)	0.35	0.26	0.20	0.16	0.14	0.12	0.12																				
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td colspan="2">Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio ZT/Z20(max)</td> <td>Z-25°C/Z+20°C</td> <td>7</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>15</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)		4	6.3	10	16	25	35	50	Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	7	4	3	2	2	2	2	Z-40°C/Z+20°C	15	8	6	4	4	3	3
Rated voltage(V)		4	6.3	10	16	25	35	50																			
Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	7	4	3	2	2	2	2																			
	Z-40°C/Z+20°C	15	8	6	4	4	3	3																			
Load Life	After 1000 hours' application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value for capacitors of 25v or more Within ±25% of initial value for capacitors of 16v or less</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> </table>	Capacitance Change	Within ±20% of initial value for capacitors of 25v or more Within ±25% of initial value for capacitors of 16v or less	Leakage Current	Initial specified value or less	Tan δ	200% or less of initial specified value																				
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Tan δ	200% or less of initial specified value																										
Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </table>	Capacitance Change	Within ±10% of initial value	Tan δ	Initial specified value or less	Leakage Current	Initial specified value or less																				
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Leakage Current	Initial specified value or less																										
Applicable Standards	JIS C-5141 and JIS C-5102																										

Chip Type



*1 Voltage mark for 6.3V is [6V]

*2 Applicable to 6.3×7.7

	(mm)					
ΦD×L	4×5.4	5×5.4	6.3×5.4	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	5.4	5.4	5.4	7.7	10.5	10.5

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

HT Series

• Dimensions

Cap. (μ F)	WV	4		6.3		10		16		25		35		50	
		0G		0J		1A		1C		1E		1V		1H	
0.1	0R1													4×5.4	0.7
0.22	R22													4×5.4	1.6
0.33	R33													4×5.4	2.5
0.47	R47													4×5.4	3.5
1	010													4×5.4	7
2.2	2R2													4×5.4	11
3.3	3R3											4×5.4	13	4×5.4	13
4.7	4R7									4×5.4	13	4×5.4	14	5×5.4	16
10	100							4×5.4	18	5×5.4	20	5×5.4	21	6.3×5.4	24
22	220			4×5.4	22	5×5.4	25	5×5.4	27	6.3×5.4	36	6.3×5.4	38	6.3×7.7	51
33	330	4×5.4	18	5×5.4	27	5×5.4	30	6.3×5.4	40	6.3×5.4	44	6.3×5.4	42	6.3×7.7	60
47	470	4×5.4	23	5×5.4	33	6.3×5.4	41	6.3×5.4	48	6.3×5.4	48	6.3×7.7	49	6.3×7.7	63
100	101	5×5.4	42	6.3×5.4	50	6.3×5.4	53	6.3×5.4	60	6.3×7.7	91	8×10.5	155	8×10.5	155
150	151	6.3×5.4	61	6.3×5.4	55	6.3×5.4	62	6.3×7.7	95	8×10.5	140	8×10.5	155	10×10.5	300
220	221	6.3×5.4	68	6.3×7.7	105	6.3×7.7	105	6.3×7.7	105	8×10.5	175	10×10.5	300		
330	331	6.3×7.7	73	6.3×7.7	105	8×10.5	175	8×10.5	195	10×10.5	220				
470	471	6.3×7.7	105	8×10.5	170	8×10.5	210	10×10.5	310						
680	681	8×10.5	210	8×10.5	210	10×10.5	310	10×10.5	350						
1000	102	8×10.5	260	10×10.5	230									Case size	Allowable ripple

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

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

NP Non-Polarized Series

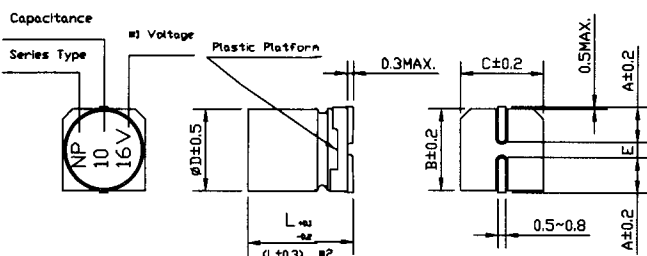


- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

◆ Specifications

Items	Performance Characteristics																					
Operating Temperature Range	-40~85°C																					
Voltage Range	6.3~50V																					
Capacitance Range	0.1~100μF																					
Capacitance Tolerance	±20% at 120Hz, 20°C																					
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.05CV or 10μA, whichever is greater.																					
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.24</td> <td>0.20</td> <td>0.17</td> <td>0.17</td> <td>0.15</td> <td>0.15</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Tan δ (max)	0.24	0.20	0.17	0.17	0.15	0.15							
Rated voltage(V)	6.3	10	16	25	35	50																
Tan δ (max)	0.24	0.20	0.17	0.17	0.15	0.15																
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Impedance ratio Z-25°C/Z+20°C</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>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Impedance ratio Z-25°C/Z+20°C	4	3	2	2	2	2	ZT/Z20(max)	8	6	4	4	3	3
Rated voltage(V)	6.3	10	16	25	35	50																
Impedance ratio Z-25°C/Z+20°C	4	3	2	2	2	2																
ZT/Z20(max)	8	6	4	4	3	3																
Load Life	After 1000 hours' application of rated voltage at 85°C with the polarity inverted every 250 hours, capacitors meet the characteristics requirements listed at right. <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 20% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ± 20% of initial value	Tan δ	200% or less of initial specified value	Leakage Current	Initial specified value or less															
Capacitance Change	Within ± 20% of initial value																					
Tan δ	200% or less of initial specified value																					
Leakage Current	Initial specified value or less																					
Self Life	After leaving capacitors under no load at 85°C for 1000 hours, they meet the specified value for load life characteristics listed above.																					
Resistance to Soldering Heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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																					

◆ Chip Type



	(mm)			
ΦD×L	4×5.4	5×5.4	6.3×5.4	6.3×7.7
A	1.8	2.1	2.4	2.4
B	4.3	5.3	6.6	6.6
C	4.3	5.3	6.6	6.6
E	1.0	1.3	2.2	2.2
L	5.4	5.4	5.4	7.7

*1 Voltage mark for 6.3V is [6V]
*2 Applicable to 6.3×7.7

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

NP Series

• Dimensions

Cap. (μ F)	WV	6.3		10		16		25		35		50	
		0J		1A		1C		1E		1V		1H	
0.1	0R1											4×5.4	1.0
0.22	R22											4×5.4	2.0
0.33	R33											4×5.4	2.8
0.47	R47											4×5.4	4.0
1	010											4×5.4	8.4
2.2	2R2									4×5.4	8.4	5×5.4	13
3.3	3R3							5×5.4	12	5×5.4	16	5×5.4	17
4.7	4R7					4×5.4	12	5×5.4	16	5×5.4	18	6.3×5.4	20
10	100			4×5.4	17	5×5.4	23	6.3×5.4	27	6.3×5.4	29	6.3×7.7	36
22	220	5×5.4	28	6.3×5.4	33	6.3×5.4	37	6.3×7.7	50	6.3×7.7	54		
33	330	6.3×5.4	37	6.3×5.4	41	6.3×5.4	49	6.3×7.7	61				
47	470	6.3×5.4	45	6.3×7.7	61	6.3×7.7	75						
100	101	6.3×7.7	82									Case size	Allowable ripple

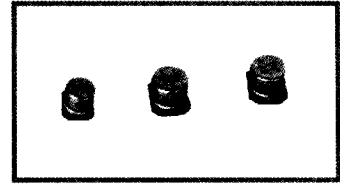
Allowable ripple (mA rms) at 85°C 120Hz

• Frequency coefficient of allowable ripple current

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

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

KP Non-Polarized with Wide Temperature Series

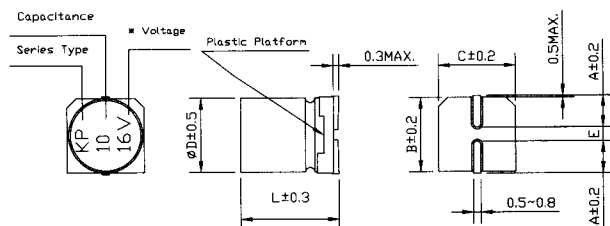


- Chip type, bi-polarized with high wide temperature range up to +105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

◆ Specifications

Items	Performance Characteristics																					
Operating Temperature Range	-55~+105°C																					
Voltage Range	6.3~50V																					
Capacitance Range	0.1~47μF																					
Capacitance Tolerance	±20% at 120 Hz, 20°C																					
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.05CV or 10μA, whichever is greater.																					
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.24</td> <td>0.20</td> <td>0.17</td> <td>0.17</td> <td>0.15</td> <td>0.15</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Tan δ (max)	0.24	0.20	0.17	0.17	0.15	0.15							
Rated voltage(V)	6.3	10	16	25	35	50																
Tan δ (max)	0.24	0.20	0.17	0.17	0.15	0.15																
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Impedance ratio Z-25°C/Z+20°C</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>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Impedance ratio Z-25°C/Z+20°C	4	3	2	2	2	2	ZT/Z20(max)	8	6	4	4	3	3
Rated voltage(V)	6.3	10	16	25	35	50																
Impedance ratio Z-25°C/Z+20°C	4	3	2	2	2	2																
ZT/Z20(max)	8	6	4	4	3	3																
Load Life	After 1000 hours' application of rated voltage at 105°C with the polarity inverted every 250 hours, capacitors meet the characteristics requirements listed at right. <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ±20% of initial value	Tan δ	200% or less of initial specified value	Leakage Current	Initial specified value or less															
Capacitance Change	Within ±20% of initial value																					
Tan δ	200% or less of initial specified value																					
Leakage Current	Initial specified value or less																					
Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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	EIAJ RC 2366																					

◆ Chip Type



	(mm)		
ΦD×L	4×5.8	5×5.8	6.3×5.8
A	1.8	2.1	2.4
B	4.3	5.3	6.6
C	4.3	5.3	6.6
E	1.0	1.3	2.2
L	5.8	5.8	5.8

* Voltage mark for 6.3V is [6V]

KP Series

• Dimensions

Cap uF	WV	6.3		10		16		25		35		50	
		0J		1A		1C		1E		1V		1H	
0.1	0R1											4×5.8	1.0
0.22	R22											4×5.8	2.0
0.33	R33											4×5.8	2.8
0.47	R47											4×5.8	4.0
1	010											4×5.8	8.4
2.2	2R2									4×5.8	8.4	5×5.8	13
3.3	3R3							5×5.8	12	5×5.8	16	5×5.8	17
4.7	4R7					4×5.8	12	5×5.8	16	5×5.8	18	6.3×5.8	20
10	100			4×5.8	17	5×5.8	23	6.3×5.8	27	6.3×5.8	29		
22	220	5×5.8	28	6.3×5.8	33	6.3×5.8	37						
33	330	6.3×5.8	37	6.3×5.8	41	6.3×5.8	49						
47	470	6.3×5.8	45									Case size	Allowable ripple

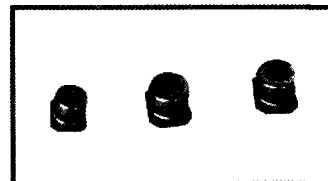
Allowable ripple (mA rms) at 105°C 120Hz

• Frequency coefficient of allowable ripple current

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

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

LZ Low Impedance Series

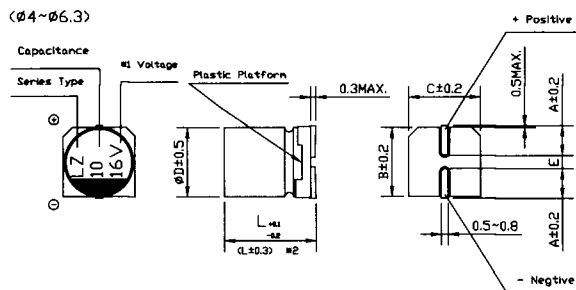


- Chip type, low impedance, temperature range up to +105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

◆ Specifications

Items	Performance Characteristics																				
Operating Temperature Range	-55~+105°C																				
Voltage Range	6.3~35V																				
Capacitance Range	1~220μF																				
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 3μA, whichever is greater.																				
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	Tan δ (max)	0.22	0.19	0.16	0.14	0.12								
Rated voltage(V)	6.3	10	16	25	35																
Tan δ (max)	0.22	0.19	0.16	0.14	0.12																
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> </tr> <tr> <td>Impedance ratio</td> <td>Z-25°C/Z+20°C</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT/Z20(max)</td> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	Impedance ratio	Z-25°C/Z+20°C	2	2	2	2	2	ZT/Z20(max)	Z-40°C/Z+20°C	4	4	3	3	3
Rated voltage(V)	6.3	10	16	25	35																
Impedance ratio	Z-25°C/Z+20°C	2	2	2	2	2															
ZT/Z20(max)	Z-40°C/Z+20°C	4	4	3	3	3															
Load Life	After 1000 hours' application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right. <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 20% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ± 20% of initial value	Tan δ	200% or less of initial specified value	Leakage Current	Initial specified value or less														
Capacitance Change	Within ± 20% of initial value																				
Tan δ	200% or less of initial specified value																				
Leakage Current	Initial specified value or less																				
Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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																				

◆ Chip Type



	(mm)			
ΦD × L	4 × 5.4	5 × 5.4	6.3 × 5.4	6.3 × 7.7
A	1.8	2.1	2.4	2.4
B	4.3	5.3	6.6	6.6
C	4.3	5.3	6.6	6.6
E	1.0	1.3	2.2	2.2
L	5.4	5.4	5.4	7.7

*1 Voltage mark for 6.3V is [6V]

*2 Applicable to 6.3×7.7

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

LZ Series

• Dimensions

Cap. (μ F)	WV	6.3			10			16			25			35		
		0J			1A			1C			1E			1V		
1.0	010													4×5.4	5.0	50
1.5	1R5													4×5.4	5.0	50
2.2	2R2													4×5.4	5.0	50
3.3	3R3													4×5.4	5.0	50
4.7	4R7										4×5.4	5.0	50	4×5.4	5.0	50
6.8	6R8										4×5.4	5.0	50	5×5.4	2.6	80
10	100							4×5.4	5.0	50	5×5.4	2.6	80	5×5.4	2.6	80
15	150							5×5.4	2.6	80	6.3×5.4	1.3	115	6.3×5.4	1.3	115
22	220	4×5.4	5.0	50	5×5.4	2.6	80	5×5.4	2.6	80	6.3×5.4	1.3	115	6.3×5.4	1.3	115
33	330	5×5.4	2.6	80	5×5.4	2.6	80	6.3×5.4	1.3	115	6.3×5.4	1.3	115	6.3×7.7	0.8	150
47	470	5×5.4	2.6	80	6.3×5.4	1.3	115	6.3×5.4	1.3	115	6.3×7.7	0.8	150	6.3×7.7	0.8	150
68	680	6.3×5.4	1.3	115	6.3×5.4	1.3	115	6.3×7.7	0.8	150	6.3×7.7	0.8	150			
100	101	6.3×5.4	1.3	115	6.3×7.7	0.8	150	6.3×7.7	0.8	150						
150	151	6.3×7.7	0.8	150	6.3×7.7	0.8	150									
220	221	6.3×7.7	0.8	150										Case size	Impedance	Allowable ripple

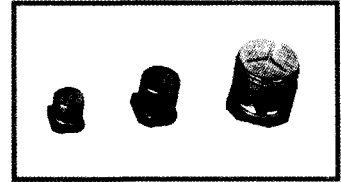
Maximum impedance (Ω) at 20°C 100kHz, allowable ripple (mA rms) at 105°C 100kHz

• Frequency coefficient of allowable ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz~
Coefficient	0.35	0.50	0.64	0.83	1.00

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

KZ Extra Lower Impedance Series

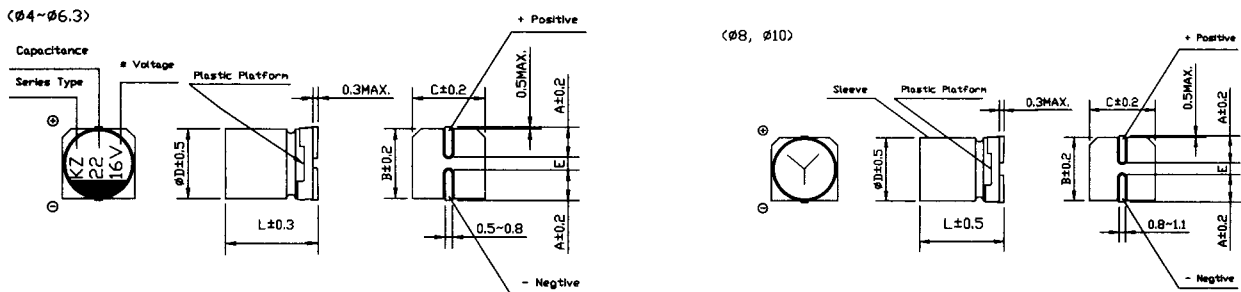


- Chip type, Extra low impedance, temperature range up to +105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

◆ Specifications

Items	Performance Characteristics																							
Operating Temperature Range	-55~+105°C																							
Voltage Range	6.3~50V																							
Capacitance Range	1~1000μF																							
Capacitance Tolerance	±20% at 120Hz, 20°C																							
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater.																							
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C () is Φ 8 over <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.22(0.28)</td> <td>0.20(0.24)</td> <td>0.16(0.20)</td> <td>0.14(0.16)</td> <td>0.12(0.14)</td> <td>0.10(0.12)</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Tan δ (max)	0.22(0.28)	0.20(0.24)	0.16(0.20)	0.14(0.16)	0.12(0.14)	0.10(0.12)									
Rated voltage(V)	6.3	10	16	25	35	50																		
Tan δ (max)	0.22(0.28)	0.20(0.24)	0.16(0.20)	0.14(0.16)	0.12(0.14)	0.10(0.12)																		
Stability at Low Temperature	Measurement frequency: 120Hz <table border="1"> <tr> <td colspan="2">Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio</td> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT/Z20(max)</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)		6.3	10	16	25	35	50	Impedance ratio	Z-25°C/Z+20°C	3	2	2	2	2	2	ZT/Z20(max)	5	4	4	3	3	3
Rated voltage(V)		6.3	10	16	25	35	50																	
Impedance ratio	Z-25°C/Z+20°C	3	2	2	2	2	2																	
	ZT/Z20(max)	5	4	4	3	3	3																	
Load Life	After 1000 hours' application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 25% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ± 25% of initial value	Tan δ	200% or less of initial specified value	Leakage Current	Initial specified value or less																	
Capacitance Change	Within ± 25% of initial value																							
Tan δ	200% or less of initial specified value																							
Leakage Current	Initial specified value or less																							
Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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																							

◆ Chip Type



* Voltage mark for 6.3V is [6V]

	(mm)					
ΦD×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 片式铝电解电容器

KZ Series

• Dimensions

Cap (μF) \ WV		6.3			10			16		
		0J			1A			1C		
15	150							4×5.8	1.8	80
22	220				4×5.8	1.8	80	5×5.8	0.76	150
27	270	4×5.8	1.8	80	5×5.8	0.76	150	5×5.8	0.76	150
33	330	5×5.8	0.76	150	5×5.8	0.76	150	6.3×5.8	0.44	230
47	470	5×5.8	0.76	150	6.3×5.8	0.44	230	6.3×5.8	0.44	230
56	560	5×5.8	0.76	150	6.3×5.8	0.44	230	6.3×5.8	0.44	230
68	680	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280
100	101	6.3×5.8	0.44	230	6.3×7.7	0.34	280	6.3×7.7	0.34	280
150	151	6.3×5.8	0.44	230	6.3×7.7	0.34	280	6.3×7.7	0.34	280
220	221	6.3×7.7	0.34	280	6.3×7.7	0.34	280	8×10.5	0.17	450
330	331	6.3×7.7	0.34	280	8×10.5	0.17	450	8×10.5	0.17	450
470	471	8×10.5	0.17	450	8×10.5	0.17	450	10×10.5	0.09	670
680	681	10×10.5	0.09	670	10×10.5	0.09	670	10×10.5	0.09	670
1000	102	10×10.5	0.09	670	10×10.5	0.09	670			

Cap. (μF) \ WV		25			35			50		
		1E			1V			1H		
1	010							4×5.8	5.00	30
1.5	1R5							4×5.8	5.00	30
2.2	2R2							4×5.8	5.00	30
3.3	3R3							4×5.8	5.00	30
4.7	4R7				4×5.8	1.8	80	5×5.8	1.52	40
10	100	4×5.8	1.8	80	5×5.8	0.76	150	6.3×5.8	0.88	120
15	150	5×5.8	0.76	150	5×5.8	0.76	150	6.3×5.8	0.88	120
22	220	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	140
27	270	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	140
33	330	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	140
47	470	6.3×7.7	0.34	280	6.3×7.7	0.34	280	6.3×7.7	0.68	140
56	560	6.3×7.7	0.34	280	6.3×7.7	0.34	280	8×10.5	0.34	230
68	680	6.3×7.7	0.34	280	6.3×7.7	0.34	280	8×10.5	0.34	230
100	101	6.3×7.7	0.34	280	8×10.5	0.17	450	10×10.5	0.18	340
150	151	8×10.5	0.17	450	10×10.5	0.09	670	10×10.5	0.18	340
220	221	8×10.5	0.17	450	10×10.5	0.09	670			
330	331	10×10.5	0.09	670				Case size	Impedance	Allowable ripple

Max. impedance (Ω) at 20°C 100kHz, allowable ripple (mA rms) at 105°C 100kHz

• Frequency coefficient of allowable ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz~
Coefficient	0.35	0.50	0.64	0.83	1.00

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

EL Long Life Assurance Series

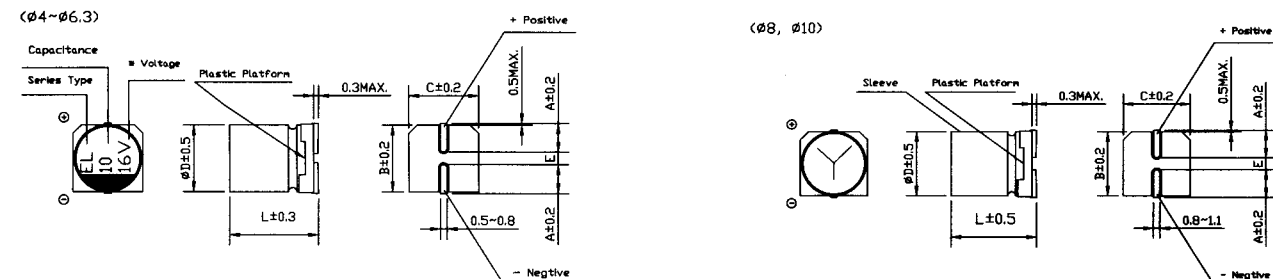
- Chip type, with load life of 2000 hours, temperature range up to +105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.



◆ Specifications

Items	Performance Characteristics																						
Operating Temperature Range	-55~+105°C																						
Voltage Range	6.3~50V																						
Capacitance Range	0.1~1000μF																						
Capacitance Tolerance	±20% at 120Hz, 20°C																						
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater.																						
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</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> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Tan δ (max)	0.28	0.24	0.20	0.16	0.13	0.12								
Rated voltage(V)	6.3	10	16	25	35	50																	
Tan δ (max)	0.28	0.24	0.20	0.16	0.13	0.12																	
Stability at Low Temperature	Measurement frequency:120Hz <table border="1"> <tr> <td>Rated voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio ZT/Z20(max)</td> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	3	3	2	2	2	2	Z-40°C/Z+20°C	8	5	4	3	3	3
Rated voltage(V)	6.3	10	16	25	35	50																	
Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	3	3	2	2	2	2																
	Z-40°C/Z+20°C	8	5	4	3	3	3																
Load Life	After 2000 hours' application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 25% of initial value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> <tr> <td>Tan δ</td> <td>200% or less of initial specified value</td> </tr> </table>	Capacitance Change	Within ± 25% of initial value	Leakage Current	Initial specified value or less	Tan δ	200% or less of initial specified value																
Capacitance Change	Within ± 25% of initial value																						
Leakage Current	Initial specified value or less																						
Tan δ	200% or less of initial specified value																						
Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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																						

◆ Chip Type



* Voltage mark for 6.3V is [6V]

(mm)

φD×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 片式铝电解电容器

EL Series

• Dimensions

Cap (uF) \ WV		6.3		10		16		25		35		50	
		0J		1A		1C		1E		1V		1H	
0.1	0R1											4×5.8	0.7
0.22	R22											4×5.8	1.6
0.33	R33											4×5.8	2.5
0.47	R47											4×5.8	3.5
1	010											4×5.8	7
2.2	2R2											4×5.8	11
3.3	3R3											4×5.8	13
4.7	4R7							4×5.8	13	4×5.8	14	5×5.8	16
10	100					4×5.8	18	5×5.8	20	5×5.8	21	6.3×5.8	24
22	220	4×5.8	22	5×5.8	25	5×5.8	27	6.3×5.8	36	6.3×5.8	38	6.3×5.8	32
33	330	5×5.8	27	5×5.8	30	6.3×5.8	40	6.3×5.8	44	6.3×5.8	42	6.3×7.7	60
47	470	5×5.8	33	6.3×5.8	41	6.3×5.8	48	6.3×5.8	48	6.3×5.8	49	6.3×7.7	63
100	101	6.3×5.8	50	6.3×5.8	53	6.3×5.8	60	6.3×7.7	91	8×10.5	130	8×10.5	140
150	151	6.3×5.8	55	6.3×7.7	105	6.3×7.7	95	8×10.5	140	8×10.5	155	10×10.5	315
220	221	6.3×7.7	100	6.3×7.7	105	6.3×7.7	105	8×10.5	175	10×10.5	315		
330	331	6.3×7.7	105	8×10.5	196	8×10.5	196	10×10.5	315				
470	471	8×10.5	210	8×10.5	210	10×10.5	315						
680	681	8×10.5	210	10×10.5	315	10×10.5	315						
1000	102	10×10.5	315	10×10.5	315							Case size	Allowable ripple

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

• Frequency coefficient of allowable ripple current

Frequency \ Cap. (uF)	50Hz	120Hz	300Hz	1kHz	10kHz~
~47	0.70	1.00	1.17	1.36	1.50
100~1000	0.85	1.00	1.08	1.20	1.30

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

KL 5000 Hours Load Life Series

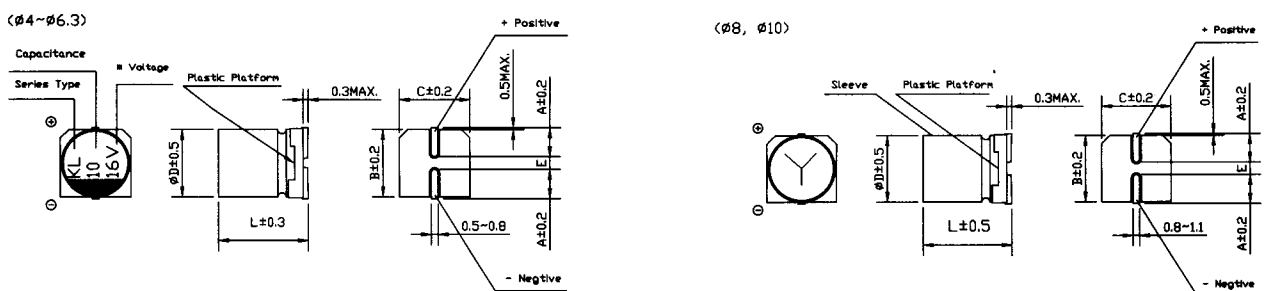


- Chip type, with load life of 5000 hours, temperature range up to +105°C.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

Specifications

Items	Performance Characteristics																											
Operating Temperature Range	-40~+105°C																											
Voltage Range	4~50V																											
Capacitance Range	0.1~1000μF																											
Capacitance Tolerance	±20% at 120Hz, 20°C																											
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater.																											
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1" style="margin-left: 20px;"> <tr> <td>Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <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> </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" style="margin-left: 20px;"> <tr> <td colspan="2">Rated voltage(V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio ZT/Z20(max)</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>Z-40°C/Z+20°C</td> <td>14</td> <td>10</td> <td>7</td> <td>5</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>		Rated voltage(V)		4	6.3	10	16	25	35	50	Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	8	4	3	2	2	2	2	Z-40°C/Z+20°C	14	10	7	5	3	3	3
Rated voltage(V)		4	6.3	10	16	25	35	50																				
Impedance ratio ZT/Z20(max)	Z-25°C/Z+20°C	8	4	3	2	2	2	2																				
	Z-40°C/Z+20°C	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" style="margin-left: 20px;"> <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> </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																											
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Self 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	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right.	<table border="1" style="margin-left: 20px;"> <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> </table>	Capacitance Change	Within ± 10% of initial value	Tan δ	Initial specified value or less	Leakage Current	Initial specified value or less																				
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Tan δ	Initial specified value or less																											
Leakage Current	Initial specified value or less																											
Applicable Standards	JIS C-5141 and JIS C-5102																											

Chip Type



* Voltage mark for 6.3V is [6V]

(mm)

ΦD × 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

KL Series

• Dimensions

Cap. (μ F)		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	25	5×5.8	27		
33	330	5×5.8	27	5×5.8	27	5×5.8	30	6.3×5.8	40		
47	470	5×5.8	33	5×5.8	33	6.3×5.8	41	6.3×5.8	48		
100	101	6.3×5.8	50	6.3×5.8	50	6.3×5.8	53	6.3×7.7	95		
150	151	6.3×5.8	55	6.3×5.8	55	6.3×7.7	105	6.3×7.7	95		
220	221	6.3×7.7	100	6.3×7.7	100	6.3×7.7	105	8×10.5	196		
330	331	6.3×7.7	100	8×10.5	196	8×10.5	196	8×10.5	196		
470	471	8×10.5	210	8×10.5	210	8×10.5	210	10×10.5	315		
680	681	8×10.5	210	8×10.5	210	10×10.5	315				
1000	102	10×10.5	315	10×10.5	315						

Cap. (μ F)		WV		25		35		50	
				1E		1V		1H	
0.1	0R1							4×5.8	0.7
0.22	R22							4×5.8	1.6
0.33	R33							4×5.8	2.5
0.47	R47							4×5.8	3.5
1	010							4×5.8	7
2.2	2R2							4×5.8	11
3.3	3R3							4×5.8	13
4.7	4R7	4×5.8	13	4×5.8	14	5×5.8	16		
10	100	5×5.8	20	5×5.8	21	6.3×5.8	24		
22	220	6.3×5.8	36	6.3×5.8	38	6.3×7.7	60		
33	330	6.3×5.8	44	6.3×5.8	42	6.3×7.7	60		
47	470	6.3×5.8	48	6.3×7.7	63	8×10.5	140		
100	101	8×10.5	140	8×10.5	130	10×10.5	315		
150	151	8×10.5	140	10×10.5	315				
220	221	10×10.5	315			Case size	Allowable ripple		

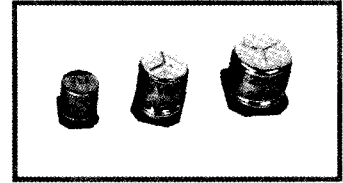
Allowable ripple (mA rms) at 105°C 120Hz

• Frequency coefficient of allowable ripple current

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

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

KH High Reliability Series



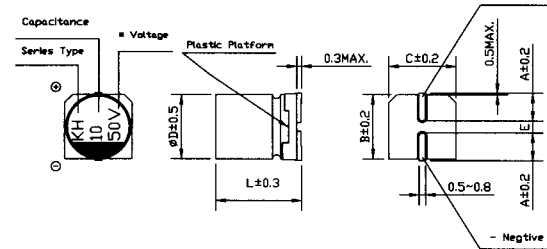
- Chip type, high temperature range, for +125°C use.
- Designed for surface mounting on high density circuit board.
- Emboss carrier tape packing system is available for automatic insertion.

◆ Specifications

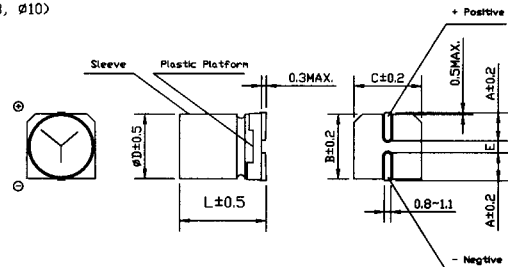
Items	Performance Characteristics													
Operating Temperature Range	-40~+125°C													
Voltage Range	10~50V													
Capacitance Range	10~330μF													
Capacitance Tolerance	± 20% at 120 Hz, 20°C													
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4μA, whichever is greater.													
Tan δ	Measurement frequency: 120Hz, Temperature: 20°C <table border="1"> <tr> <td>Rated voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan δ (max)</td> <td>0.32</td> <td>0.24</td> <td>0.21</td> <td>0.18</td> <td>0.18</td> </tr> </table>	Rated voltage(V)	10	16	25	35	50	Tan δ (max)	0.32	0.24	0.21	0.18	0.18	
Rated voltage(V)	10	16	25	35	50									
Tan δ (max)	0.32	0.24	0.21	0.18	0.18									
Stability at Low Temperature	Measurement frequency: 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> </tr> <tr> <td>Impedance ratio ZT/Z20(max)</td> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> </tr> </table>	Rated voltage(V)	10	16	25	35	50	Impedance ratio ZT/Z20(max)	Z-40°C/Z+20°C	12	8	6	4	4
Rated voltage(V)	10	16	25	35	50									
Impedance ratio ZT/Z20(max)	Z-40°C/Z+20°C	12	8	6	4	4								
Load Life	After 1000 hours' application of rated voltage at 125°C, capacitors meet the characteristics requirements listed at right <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ± 30% of initial value</td> </tr> <tr> <td>Tan δ</td> <td>300% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance Change	Within ± 30% of initial value	Tan δ	300% or less of initial specified value	Leakage Current	Initial specified value or less							
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Tan δ	300% or less of initial specified value													
Leakage Current	Initial specified value or less													
Self Life	After leaving capacitors under no load at 125°C for 1000 hours, they meet the specified value for load life characteristics listed above.													
Resistance to Soldering Heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristics requirements listed at right. <table border="1"> <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> </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													

◆ Chip Type

(ø6.3)



(ø8, ø10)



* Voltage mark for 6.3V is [6V]

(mm)

ΦD×L	6.3 × 7.7	8 × 10.5	10 × 10.5
A	2.4	2.9	3.2
B	6.6	8.3	10.3
C	6.6	8.3	10.3
E	2.2	3.1	4.5
L	7.7	10.5	10.5

V-CHIP ALUMINUM ELECTROLYTIC CAPACITORS 片式铝电解电容器

KH Series

• Dimensions

Cap (μ F)	WV	10		16		25		35		50	
		1A		1C		1E		1V		1H	
10	100									6.3×7.7	24
22	220									6.3×7.7	38
33	330							6.3×7.7	44	8×10.5	46
47	470					6.3×7.7	48	8×10.5	52	10×10.5	58
100	101	6.3×7.7	58	8×10.5	66	8×10.5	74	10×10.5	80		
220	221	8×10.5	90	10×10.5	102	10×10.5	116				
330	331	10×10.5	112							Case size	Allowable ripple

Allowable ripple (mA rms) at 125°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