



# Miniature Aluminum Electrolytic Capacitors

Series  
**CHK**

## FEATURES

1. Rated Working Voltage Range 6.3 to 100 VDC/160 to 450VDC at Operation Temperature Range -55to +105°C/-40to +105°C
2. This series is for communication equipments, switching power supply, industrial measuring instruments, Automotive electric products, etc

## SPECIFICATIONS

Item	Performance Characteristics																																					
Operating Temperature Range	-55 to +105°C	-40 to +105°C																																				
Rated Working voltage Range	6.3 to 100V DC	160 to 450V DC																																				
Nominal Capacitance Range	0.1- 33000(uF)																																					
Capacitance Tolerance	± 20% ( 120Hz, +20°C )																																					
Leakage Current	$I \leq 0.01CV$ or 3(uA) Whichever is greater	$I \leq 0.03CV + 40(uA)$																																				
	after 2 minutes application of rated working voltage at +20°C																																					
Dissipation Factor $\tan \delta$  (120Hz+20°C)	<table border="1"> <thead> <tr> <th>Working voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td><math>\tan \delta</math> (max.)</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </tbody> </table>	Working voltage(V)	6.3	10	16	25	35	50	63	100	$\tan \delta$ (max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08																			
	Working voltage(V)	6.3	10	16	25	35	50	63	100																													
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Working voltage(V)	160	200	250	350	400	450																																
$\tan \delta$ (max.)	0.15	0.15	0.15	0.15	0.15	0.15																																
For capacitance value >1000uF add 0.02per another 1000uF																																						
Ripple Current	Refer to standard products table (120Hz,+105°C) Correction factor for frequency																																					
	6.3~100	<table border="1"> <thead> <tr> <th rowspan="2">Voltage (V)</th> <th>Freq(Hz)</th> <th>50Hz</th> <th>120Hz</th> <th>300Hz</th> <th>1kHz</th> <th>10kHz~</th> </tr> <tr> <th>CAP(uF)</th> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td>0.1~47</td> <td>0.75</td> <td>1.00</td> <td>1.35</td> <td>1.57</td> <td>2.00</td> </tr> <tr> <td>100~470</td> <td>0.80</td> <td>1.00</td> <td>1.23</td> <td>1.34</td> <td>1.50</td> </tr> <tr> <td>1000~33000</td> <td>0.85</td> <td>1.00</td> <td>1.10</td> <td>1.13</td> <td>1.15</td> </tr> </tbody> </table>	Voltage (V)	Freq(Hz)	50Hz	120Hz	300Hz	1kHz	10kHz~	CAP(uF)						0.1~47	0.75	1.00	1.35	1.57	2.00	100~470	0.80	1.00	1.23	1.34	1.50	1000~33000	0.85	1.00	1.10	1.13	1.15					
		Voltage (V)		Freq(Hz)	50Hz	120Hz	300Hz	1kHz	10kHz~																													
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	0.1~47	0.75	1.00	1.35	1.57	2.00																																
	100~470	0.80	1.00	1.23	1.34	1.50																																
1000~33000	0.85	1.00	1.10	1.13	1.15																																	
160~450	0.47~220	0.80	1.00	1.25	1.40	1.60																																
	330~1000	0.90	1.00	1.10	1.13	1.15																																
Multiplier for Ripple Current vs. Temperature	Temperature°C	45	60	70	85	105																																
	Multiplier	2.10	1.90	1.40	1.25	1.00																																

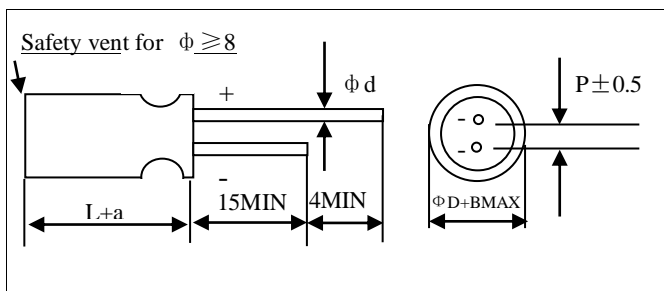


## Miniature Aluminum Electrolytic Capacitors

Low Temperature Characteristics	Impedance ratio max. at 120Hz																											
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	Working voltage(V)	6.3	10	16	25	35	50	63	100																			
	Z-25°C/Z+20°C	5	4	3	2	2	2	2	2																			
Z-55°C/Z+20°C	12	10	8	5	4	3	3	3																				
<table border="1"> <tr> <td>Working voltage(V)</td> <td>160</td> <td>200</td> <td>250</td> <td>350</td> <td>400</td> <td>450</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>6</td> <td>15</td> </tr> </table>	Working voltage(V)	160	200	250	350	400	450	Z-40°C/Z+20°C	3	3	4	4	6	15														
Working voltage(V)	160	200	250	350	400	450																						
Z-40°C/Z+20°C	3	3	4	4	6	15																						
For capacitance value >1000uF	Add0.5 per another 1000uF for Z-25°C/Z+20°C Add1.0 per another 1000uF for Z-40°C/Z+20°C																											
High temperature Loading	Test conditions Duration : 2000 hours Ambient temperature : +105°C Applied voltage : DC voltage with maximum permissible ripple current specified at +105°C (Sum of the DC voltage and superimposed pea AC voltage for maximum permissible ripple current should be equal to rated DC working voltage )																											
	Post test requirements at +20°C Leakage current : ≤ Initial specified value Capacitance change : ≤ ±20% of initial measured value tan δ : ≤200% of initial specified value																											
Shelf life	Test conditions Duration : 1000 hours Ambient temperature : +105°C Applied voltage : (None)																											
	Post test requirements at +20°C Same Limits for high temperature loading																											
Others	JIS C-5141 JIS C-5102																											

### CASE SIZE TABLE

Unit:mm



D φ	5	6.3	8	8	10	13	16	18	22
P	2.0	2.5	3.5	3.5	5	5	7.5	7.5	10
d φ ±0.05	0.5		0.6			0.8			

aMAX	(L<20)1.5
	(L≥20)2.0

BMAX	(D<20)0.5
	(D≥20)1.0

### DIMENSIONS

WV(SV)		ΦD ×L(mm)											
Cap.(uF)	Code	6.3V(8)		10V(13)		16V(20)		25V(32)		35V(44)			
		0J		1A		1C		1E		1V			
4.7	475							5×11	22	5×11			25
10	106					5×11	30	5×11	36	5×11			39
22	226	5×11	28	5×11	41	5×11	54	5×11	58	5×11			61



## Miniature Aluminum Electrolytic Capacitors

33	336	5×11	43	5×11	58	5×11	65	5×11	68	5×11	75
47	476	5×11	56	5×11	68	5×11	79	5×11	83	6.3×11	93
100	107	5×11	93	5×11	105	5×11	115	6.3×11	140	8×12	150
220	227	6.3×11	145	6.3×11	175	6.3×11	190	8×12	240	10×12.5	275
330	337	6.3×11	195	6.3×11	210	8×12	265	10×12.5	315	10×15	340
470	477	6.3×11	230	8×12	250	8×12	315	10×12.5	375	10×20	415
1000	108	8×12	390	10×12.5	445	10×17	510	10×20	595	13×21	715
2200	228	10×20	645	10×20	695	13×21	825	13×25	930	16×26	1110
3300	338	13×21	750	13×21	895	13×25	1000	16×26	1180	16×35	1400
4700	478	13×21	965	13×25	1080	16×26	1220	16×30	1470	18×36	1720
6800	688	13×25	1150	16×26	1330	16×35	1540	18×36	1830	22×40	2150
10000	109	16×26	1430	16×35	1680	18×36	1930	22×40	2150	22×50	2650
15000	159	16×35	1830	18×36	2110	22×40	2430	22×50	2750	25×50	3100
22000	229	18×40	2290	22×40	2650	22×50	3000	25×50	3250		
33000	339	22×50	2800	22×50	3250	25×50	3450			Case size	Allowable ripple

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

### DIMENSIONS

ΦD×L(mm)

WV(SV) Cap.(uF) Code		50V(63)		63V(79)		100V(125)		160V(200)		200V(250)	
		1H		1J		2A		2C		2D	
0.1	104	5×11	1.1			5×11	1.5				
0.22	224	5×11	2.3			5×11	3.4				
0.33	334	5×11	3.5			5×11	5.0				
0.47	474	5×11	7			5×11	7.0	6.3×11	8.6	6.3×11	8.6
1	105	5×11	12			5×11	15	6.3×11	22	6.3×11	22
2.2	225	5×11	18			5×11	21	6.3×11	28	6.3×11	28
3.3	335	5×11	25			5×11	29	6.3×11	31	6.3×11	31
4.7	475	5×11	29			5×11	32	6.3×11	34	8×12	38
10	106	5×11	46	5×11	46	6.3×11	54	8×12	61	10×12.5	64
22	226	5×11	68	6.3×11	71	8×12	93	10×17	98	10×20	101
33	336	6.3×11	86	6.3×11	100	8×12	130	10×20	186	13×21	200
47	476	6.3×11	115	8×12	120	10×12.5	165	13×21	215	13×21	215
100	107	8×12	190	10×12.5	215	10×20	265	13×25	270	16×30	280
220	227	10×17	295	10×20	335	13×25	440	16×35	470	18×36	480
330	337	10×20	375	13×21	510	16×26	540	18×40	550	22×40	570
470	477	13×21	530	13×25	640	16×30	715	22×40	770	22×50	790
1000	108	16×26	790	16×30	530	18×40	985	25×50	1030		
2200	228	18×40	1220	18×40	1650	22×50	1750				
3300	338	18×40	1580	22×40	1950	22×50	2070				
4700	478	22×40	2100	22×50	2450						
6800	688	22×50	2500	22×50	2800						
10000	109	22×50	2850							Case size	Allowable ripple

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

ΦD×L(mm)

WV(SV) Cap.(uF) Code		250V(300)	350V(400)	400V(450)	450V(500)
		2E	2V	2G	2W
0.1	104				



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0.22	224								
0.33	334								
0.47	474	6.3×11	8.6						
1	105	6.3×11	12	6.3×11	13	8×12	13	8×12	13
2.2	225	6.3×11	18	8×12	18	10×12.5	18	10×12.5	20
3.3	335	8×12	24	10×12.5	23	10×12.5	23	10×15	25
4.7	475	8×12	28	10×12.5	28	8×12	30	10×20	32
10	106	10×17	46	10×20	47	13×21	50	13×21	50
22	226	13×21	79	13×25	79	16×35	86	16×26	86
33	336	13×21	100	16×26	100	16×30	110	16×35	120
47	476	13×25	120	16×35	120	16×35	120	18×40	130
100	107	16×30	180	18×40	180	22×40	250	22×40	250
220	227	22×40	310	22×50	500	25×50	540		
330	337	22×50	640						
470	477	25×50	860					Case size	Allowable ripple

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