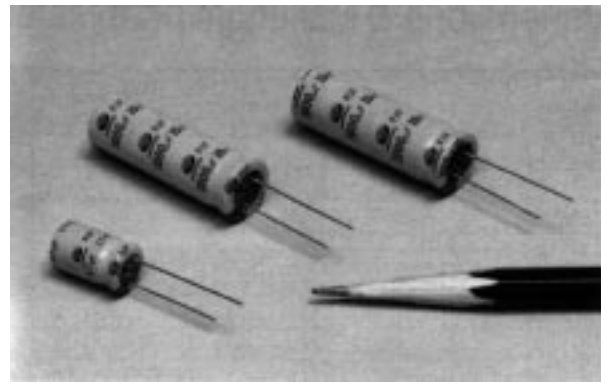


## ■ Features

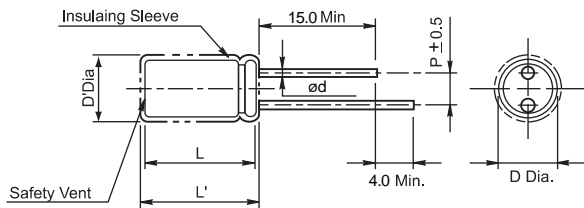
- Very low impedance and ESR at high frequency
- Large permissible ripple current
- High performance and reliability
- For switching mode power supplies (SMPS)
- Load life of 2000 hours at 105°C
- Possible cleaning by Freon TE, TES, TMS (5 min)



## ■ Specifications

Item	Performance Characteristics							
Operating temperature range	-55°C ~ +105°C							
Rated working voltage range	6.3V ~ 50V							
Nominal capacitance range	1μF ~ 1000μF, ±20%(at 20°C, 120Hz)							
D.C Leakage current(at 20°C)	The following specifications shall be satisfied when the rated voltage is applied for the required time. $I \leq 0.002CV$ or $2\mu A(3 \text{ min})$ , whichever is greater Where I = Leakage current(μA) C = Nominal capacitance(μF) V = Rated voltage(V)							
Tan δ(max., at 20°C, 120Hz)	W.V(V)	6.3	10	16	25	35	50	
	Tan δ	0.12	0.10	0.08	0.06	0.06	0.05	
Characteristics at low temperature(max.) (impedance ratio at 120Hz)	W.V(V)	6.3-10		16	25-50			
	Z-55°C/Z20°C	3		2	2			
Load life	After applying rated working voltage for 2000 hours at +105°C and then being stabilized at +20°C, capacitors shall meet following limits.							
	Capacitance change	Within ± 15% of initial measured value						
	Tan δ	≤ 150% of initial specified value						
	Leakage current	≤ Initial specified value						
Shelf life	After storage for 500 hours at +105°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet following limits.							
	Capacitance change	Within ± 10% of initial measured value						
	Tan δ	≤ 115% of initial specified value						
	Leakage current	≤ 200% of initial specified value						

## ■ Case sizes and Dimensions



### • Standard lead style

øD	8.0	10.0	13.0
P	3.5	5.0	
ød	0.6		

D' = [D+0.5]Max.

L' = [L+1.0]Max. at D ≤ 8.0

L' = [L+1.5]Max. at D ≥ 10.0

## ■ Ripple current coefficient

### • Frequency

W.V	Freq(Hz)	50	120	300	1K	10-100K
6.3-16V		0.54	0.70	0.85	0.95	1
25-35V		0.43	0.57	0.73	0.88	1
50V		0.39	0.55	0.71	0.86	1

### • Temperature

Temperature	≤ 40°C	70°C	85°C	105°C
Factor	1.5	1.3	1	0.55

## Dimensions & Maximum permissible ripple current [mA(rms) at 85°C, 100Hz]

øD x L(mm)

Cap(μF) \ W.V	6.3		10		16		25		35		50	
	SIZE	I <sub>r</sub>	SIZE	I <sub>r</sub>	SIZE	I <sub>r</sub>	SIZE	I <sub>r</sub>	SIZE	I <sub>r</sub>	SIZE	I <sub>r</sub>
1.0											8x11.5	80
2.2											8x11.5	100
3.3											8x11.5	130
4.7											8x11.5	150
10									8x11.5	220	8x11.5	220
22							8x11.5	330	10x12.5	330	10x12.5	340
33					8x11.5	350	10x12.5	410	10x16	410	10x16	420
47			8x11.5	370	10x12.5	420	10x12.5	480	10x16	480	10x20	510
100	10x12.5	510	10x16	560	10x16	630	10x20	730	13x20	750	13x25	780
220	10x20	780	10x20	850	13x20	970	13x20	1100	13x25	1120	13x40	1280
330	13x20	970	13x20	1060	13x25	1310	13x25	1410	13x40	1550		
470	13x20	1280	13x25	1420	13x40	2440	13x40	1900				
1000	13x25	1970	13x40	2870								

### Max. Impedance (Ω at 20°C, 100 KHz)

Cap(μF) \ W.V	6.3	10	16	25	35	50
1.0						31
2.2						14
3.3						9.3
4.7						6.5
10					1.5	2.1
22				0.97	1.2	1.40
33			0.97	0.95	0.93	0.90
47		0.90	0.85	0.68	0.67	0.65
100	0.67	0.57	0.45	0.35	0.30	0.26
220	0.33	0.27	0.23	0.16	0.17	0.15
330	0.24	0.20	0.12	0.12	0.12	
470	0.17	0.12	0.11	0.07		
1000	0.09	0.06				

### Max.ESR (Ω at 20°C)

Cap(μF) \ W.V	6.3		10		16		25		35		50	
	120Hz	1KHz	120Hz	1KHz	120Hz	1KHz	120Hz	1KHz	120Hz	1KHz	120Hz	1KHz
1.0											66.4	46.2
2.2											30.2	21.0
3.3											20.0	14.0
4.7											14.0	9.8
10									8.00	2.0	6.6	4.5
22							3.60	2.0	3.60	1.5	3.0	2.1
33					3.20	1.92	2.60	1.44	2.40	1.3	2.0	1.4
47			2.80	1.68	2.30	1.38	1.70	1.02	1.70	1.02	1.4	1.0
100	1.59	0.95	1.33	0.80	1.06	0.63	0.80	0.48	0.80	0.40	0.66	0.46
220	0.72	0.43	0.60	0.36	0.48	0.29	0.36	0.22	0.36	0.22	0.30	0.21
330	0.48	0.29	0.40	0.24	0.28	0.17	0.24	0.14	0.24	0.14		
470	0.34	0.20	0.28	0.17	0.23	0.14	0.17	0.10				
1000	0.16	0.10	0.13	0.08								

## PERFORMANCE CURVES

— 50V-47 $\mu$ F  
 - - - 16V-470 $\mu$ F

