

# TLS

## +85°C Low Leakage Axial Lead Aluminum Electrolytic Capacitors



*For all timing applications*

### FEATURES

- Alternative to Tantalum Capacitors
- Capacitance range: .1  $\mu$ F to 100  $\mu$ F
- Long life
- Voltage range: 10 WVDC to 50 WVDC
- Solvent Tolerant End Seals Standard

### SPECIFICATIONS

<b>Capacitance Tolerance</b>		<b><math>\pm 20\%</math> at 120Hz, 20°C</b>													
<b>Operating Temperature Range</b>		<b>-40°C to +85°C</b>													
<b>Dissipation Factor 120Hz, 20°C</b>	<b>WVDC</b>	<b>10</b>	<b>16</b>	<b>25</b>	<b>35</b>	<b>50</b>									
	<b>tan<math>\delta</math></b>	.20	.16	.14	.12	.10									
<b>Impedance Ratio (Max.) @120Hz</b>	<b>WVDC</b>	<b>10</b>	<b>16</b>	<b>25</b>	<b>35</b>	<b>50</b>									
	<b>-25°C/20°C</b>	3	2	2	2	2									
	<b>-40°C/20°C</b>	6	4	4	3	3									
<b>Leakage Current</b>	<b>WVDC</b>	<b><math>\leq 50</math> WVDC</b>													
	<b>Time</b>	<b>2 minutes</b>													
		<b>&lt;.002 CV or .4<math>\mu</math>A whichever is greater</b>													
<b>Load Life</b>	<b>2,000 hours at + 85°C with rated voltage</b>														
	Capacitance change Dissipation factor Leakage current	<b>&lt; 20% of initial measured value &lt;200% of initial specified value &lt;Initial specified value</b>													
<b>Shelf Life</b>	1000 hours at +85°C with no voltage applied. Units will meet load life specification														
<b>Ripple Current Multipliers</b>		<b>Frequency (Hz)</b>						<b>Temperature Multiplier (°C)</b>							
	Capacitance ( $\mu$ F)	50	120	400	1K	10K	50K	+85	+70	+60	+30				
	C $\leq$ 10	0.8	1.0	1.3	1.45	1.65	1.7	1.0	1.3	1.5	1.8				
	10<C $\leq$ 100	0.8	1.0	1.23	1.36	1.48	1.53	1.0	1.3	1.5	1.8				

### SPECIAL ORDER OPTIONS

(See Pages 33 thru 37)

- Special tolerances:  $\pm 10\%$  (K), -10% + 30%(Q)
- Tape and Reel
- Epoxy end seal
- Polyester Sleeve



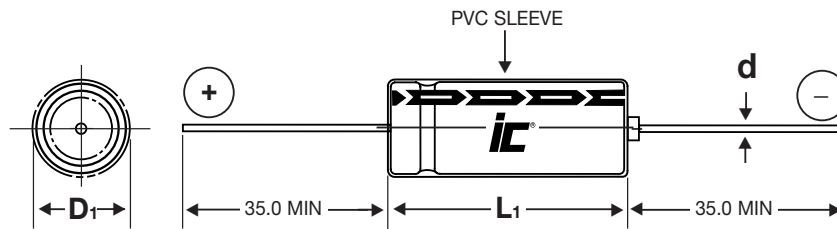
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## PHYSICAL DIMENSIONS

WVDC (SV) μF	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)
.10				→	5x12.5
.15				→	5x12.5
.22				→	5x12.5
.33				→	5x12.5
.47				→	5x12.5
.68				→	5x12.5
1.0				→	5x12.5
1.5				→	5x12.5
2.2				→	5x12.5
3.3				→	5x12.5
4.7				→	5x12.5
6.8				→	5x12.5
10				→	5x12.5
15			→	→	6.3x12.5
22	→	→	→	→	6.3x16
33	→	→	→	→	8x16
47	→	→	→	→	8x16
68	→	→	→	→	
100	→	→	→	→	

Convert to inches, divide by 25.4

DxL (mm)



NOTE: Case Vent is standard on all diameter ≥8.0mm

### LEAD INFORMATION VS. CASE DIAMETER

D	5.0	6.3	8.0
d	0.6	0.6	0.6
B	0.5	0.5	0.5

D<sub>1</sub>=D+B Max.  
L<sub>1</sub>=L+1.0 Max.

# TLS

+ 85°C Low Leakage  
Axial Lead Aluminum  
Electrolytic Capacitors

## STANDARD PART LISTING

Capacitance (μF)	WVDC	ic <sup>®</sup> PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
.10	50	104TLS050M	1657.9	4	5x12.5
.15	50	154TLS050M	1105.2	5	5x12.5
.22	50	224TLS050M	753.57	6	5x12.5
.33	50	334TLS050M	502.38	7	5x12.5
.47	50	474TLS050M	352.94	10	5x12.5
.68	50	684TLS050M	243.8	14	5x12.5
1.0	50	105TLS050M	165.79	17	5x12.5
1.5	50	155TLS050M	110.52	22	5x12.5
2.2	50	225TLS050M	75.36	26	5x12.5
3.3	50	335TLS050M	50.24	31	5x12.5
4.7	50	475TLS050M	35.27	37	5x12.5
6.8	50	685TLS050M	24.38	45	5x12.5
10	35	106TLS035M	19.89	50	5x12.5
10	50	106TLS050M	16.58	60	6.3x12.5
15	25	156TLS025M	15.47	55	5x12.5
15	50	156TLS050M	11.05	73	6.3x12.5
22	16	226TLS016M	12.06	62	5x12.5

Capacitance (μF)	WVDC	ic <sup>®</sup> PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
22	35	226TLS035M	9.04	80	6.3x12.5
22	50	226TLS050M	7.54	98	6.3x16
33	10	336TLS010M	10.05	68	5x12.5
33	25	336TLS025M	7.03	90	6.3x12.5
33	35	336TLS035M	6.03	110	6.3x16
33	50	336TLS050M	5.02	145	8x16
47	16	476TLS016M	5.64	100	6.3x12.5
47	25	476TLS025M	4.94	120	6.3x16
47	50	476TLS050M	3.53	165	8x16
68	10	686TLS010M	4.88	110	6.3x12.5
68	16	686TLS016M	3.9	135	6.3x16
68	35	686TLS035M	2.93	180	8x16
100	10	107TLS010M	3.32	148	6.3x16
100	16	107TLS016M	2.65	190	8x16
100	25	107TLS025M	2.32	200	8x16
100	35	107TLS035M	1.99	250	8x20