



## Aluminum Electrolytic Capacitors

+105°C General Purpose, Axial Lead

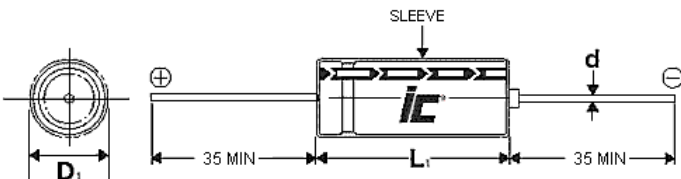
### FEATURES

Extended Life - High Voltage

### APPLICATIONS

Filtering - Bypass - Coupling - Blocking

<b>Operating Temperature Range</b>		<b>-40°C to +105°C (6.3 to 400 WVDC)</b> <b>-25°C to +105°C (450 WVDC)</b>														
<b>Capacitance Tolerance</b>		<b>+20% at 120 Hz, 20°C</b>														
<b>Surge voltage</b>	<b>WVDC</b>	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	
	<b>SVDC</b>	7.9	13	20	32	44	63	79	125	200	250	300	400	450	500	
<b>Dissipation Factor</b>	<b>WVDC</b>	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	
	<b>Tan δ</b>	.28	.24	.2	.18	.14	.12	.1	.09	.2	.2	.2	.2	.25	.25	
		Add .02 for every 1000uF above 1000uF														
<b>Leakage current</b>		<b>6.3 to 100 WVDC</b>							<b>160 to 450 WVDC</b>							
		<b>1 Minutes</b>							<b>1 Minute</b>			<b>1 Minute</b>				
		.03CV or 4uA, Whichever is greater							CV≤1000 .01CV+40uA			CV>1000 .04CV+100uA				
<b>Low temperature stability Impedance ratio (120 Hz)</b>	<b>WVDC</b>	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	
	<b>-25°C to +20°C</b>	5	4	3	2	2	2	2	2	3	3	3	3	3	5	
	<b>-40°C to +20°C</b>	12	10	8	6	5	4	4	4	8	6	6	6	6	-	
<b>Load Life</b>		<b>2000 hours at 105°C with rated WVDC and ripple current applied</b>														
		<b>Capacitance change</b>		≤20% of initial measured value												
		<b>Dissipation factor</b>		≤200% of maximum specified value												
		<b>Leakage current</b>		≥100% of maximum specified value												
<b>Shelf Life</b>		<b>1000 hours at 105°C with no voltage applied</b>														
		<b>Capacitance change</b>		≤20% initial measured value												
		<b>Dissipation factor</b>		≤200% of maximum specified value												
		<b>Leakage current</b>		≥100% of maximum specified value												
<b>Ripple Current Multipliers</b>		<b>Capacitance</b>	<b>Frequency (Hz)</b>							<b>Temperature (°C)</b>						
		<b>uF</b>	<b>50</b>	<b>120</b>	<b>400</b>	<b>1k</b>	<b>10k</b>	<b>50k</b>	<b>+105</b>	<b>+85</b>	<b>+70</b>					
		<b>C≤47</b>	.75	1.0	1.35	1.57	2.0	2.0	1.0	1.4	1.62					
		<b>47&lt;C≤470</b>	.8	1.0	1.23	1.34	1.5	1.5	1.0	1.4	1.62					
		<b>C&gt;470</b>	.85	1.0	1.1	1.13	1.15	1.15	1.0	1.4	1.62					



D	5	6.3	8	10	12.5	16	18	22	25					
d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8					
B	0.5	0.5	0.5	0.5	0.8	0.5	0.5	1.0	1.0					

D ≤ 10mm, L<sub>1</sub> = L + 1.5mm Max.  
D > 10mm, L<sub>1</sub> = L + 2mm Max.  
D<sub>1</sub> = D + B Max.

# TMA

+105°C, Extended Life, 2000 hours

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR (Ω) 120 Hz, +20°C	Maximum RMS Ripple Current (mA) 120 Hz, +105°C	Dims DxDL (mm)
0.47	100	474TMA100M	317.463	10	5x13
1	50	105TMA050M	198.944	10	5x13
1	100	105TMA100M	149.208	14	5x13
1	200	105TMA200M	331.573	9	6.3x13
1	350	105TMA350M	331.573	10	6.3x16
1	400	105TMA400M	414.466	12	8x16
1	450	105TMA450M	414.466	12	8x16
2.2	50	225TMA050M	90.428	18	5x13
2.2	100	225TMA100M	67.822	19	5x13
2.2	200	225TMA200M	150.715	17	6.3x16
2.2	350	225TMA350M	150.715	17	8x16
2.2	400	225TMA400M	188.394	19	8x20
2.2	450	225TMA450M	199.394	22	10x20
3.3	50	335TMA050M	60.286	22	5x13
3.3	100	335TMA100M	45.215	27	6.3x13
3.3	250	335TMA250M	100.477	24	8x16
3.3	350	335TMA350M	100.477	24	8x20
3.3	400	335TMA400M	125.596	27	10x21
3.3	450	335TMA450M	125.596	27	10x21
4.7	63	475TMA063M	35.274	32	5x13
4.7	100	475TMA100M	31.746	32	6.3x13
4.7	200	475TMA200M	70.547	28	8x16
4.7	250	475TMA250M	70.547	32	8x20
4.7	350	475TMA350M	70.547	33	10x20
4.7	400	475TMA400M	88.184	33	10x20
4.7	450	475TMA450M	88.184	36	10x25
10	35	106TMA035M	23.21	33	5x13
10	50	106TMA050M	19.894	41	5x13
10	63	106TMA063M	16.579	44	6.3x13
10	100	106TMA100M	14.921	52	6.3x16
10	160	106TMA160M	33.157	43	8x20
10	200	106TMA200M	33.157	50	10x21
10	250	106TMA250M	33.157	50	10x21
10	350	106TMA350M	33.157	60	13x26
10	400	106TMA400M	41.447	60	13x26
10	450	106TMA450M	41.447	67	12.5x30
22	25	226TMA025M	12.057	48	5x13
22	35	226TMA035M	10.55	57	6.3x13
22	63	226TMA063M	7.536	73	6.3x16
22	100	226TMA100M	6.782	85	8x16
22	160	226TMA160M	15.071	85	10x26
22	250	226TMA250M	15.071	100	13x26
22	350	226TMA350M	15.071	110	16x31
22	400	226TMA400M	18.839	110	16x31
22	450	226TMA450M	18.839	130	16x40
33	16	336TMA016M	10.048	54	5x13
33	25	336TMA025M	8.038	64	6.3x13
33	63	336TMA063M	5.024	89	6.3x16
33	100	336TMA100M	4.522	115	8x20
33	160	336TMA160M	10.048	120	13x26
33	200	336TMA200M	10.048	135	13x26
33	250	336TMA250M	10.048	135	13x26
33	350	336TMA350M	10.048	150	16x31
33	400	336TMA400M	12.56	155	16x41
33	450	336TMA450M	12.56	160	18x40
47	10	476TMA010M	8.466	57	5x13
47	16	476TMA016M	7.055	71	6.3x13
47	50	476TMA050M	4.233	100	6.3x16

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR (Ω) 120 Hz, +20°C	Maximum RMS Ripple Current (mA) 120 Hz, +105°C	Dims DxDL (mm)
47	63	476TMA063M	3.527	115	8x16
47	100	476TMA100M	3.175	135	8x20
47	160	476TMA160M	7.055	155	13x31
47	200	476TMA200M	7.055	155	13x31
47	250	476TMA250M	7.055	175	16x31
47	350	476TMA350M	7.055	185	16x41
47	400	476TMA400M	8.818	200	18x41
47	450	476TMA450M	8.818	220	22x40
100	6.3	107TMA6R3M	4.642	89	6.3x13
100	25	107TMA025M	2.653	120	6.3x16
100	50	107TMA050M	1.989	155	8x16
100	63	107TMA063M	1.658	185	8x20
100	100	107TMA100M	1.492	240	10x26
100	160	107TMA160M	3.316	300	16x41
100	200	107TMA200M	3.316	300	16x41
100	250	107TMA250M	3.316	300	16x41
100	350	107TMA350M	3.316	310	22x41
100	400	107TMA400M	4.145	330	22x51
220	10	227TMA010M	1.809	115	6.3x16
220	25	227TMA025M	1.206	200	8x16
220	35	227TMA035M	1.055	240	8x20
220	50	227TMA050M	0.904	290	10x21
220	63	227TMA063M	0.754	340	10x26
220	100	227TMA100M	0.678	430	13x31
220	160	227TMA160M	1.507	510	22x41
220	200	227TMA200M	1.507	510	22x41
220	250	227TMA250M	1.507	550	22x51
330	16	337TMA016M	1.005	230	8x16
330	25	337TMA025M	0.804	270	8x20
330	35	337TMA035M	0.703	330	10x21
330	50	337TMA050M	0.603	400	10x26
330	63	337TMA063M	0.504	460	13x26
330	100	337TMA100M	0.452	570	16x31
470	10	477TMA010M	0.847	250	8x16
470	16	477TMA016M	0.706	310	8x20
470	25	477TMA025M	0.564	370	10x21
470	35	477TMA035M	0.494	430	10x26
470	50	477TMA050M	0.423	530	13x26
470	63	477TMA063M	0.353	590	13x31
470	100	477TMA100M	0.318	770	16x41
1000	10	108TMA010M	0.398	460	10x21
1000	16	108TMA016M	0.332	550	10x26
1000	25	108TMA025M	0.265	640	13x26
1000	35	108TMA035M	0.232	750	13x31
1000	50	108TMA050M	0.199	890	16x31
1000	63	108TMA063M	0.166	940	16x31
1000	100	108TMA100M	0.149	1210	22x41
2200	10	228TMA010M	0.211	780	13x26
2200	16	228TMA016M	0.181	910	13x31
2200	25	228TMA025M	0.151	1040	16x31
2200	35	228TMA035M	0.136	1120	16x31
2200	50	228TMA050M	0.121	1360	18x41
2200	63	228TMA063M	0.106	1740	22x41
3300	6.3	338TMA6R3M	0.171	860	13x26
3300	10	338TMA010M	0.151	980	13x31
3300	16	338TMA016M	0.131	1140	16x31
3300	25	338TMA025M	0.111	1200	16x31
3300	35	338TMA035M	0.101	1430	16x41

# TMA

+105°C, Extended Life, 2000 hours

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR (Ω) 120 Hz, +20°C	Maximum RMS Ripple Current (mA) 120 Hz, +105°C	Dims DxL (mm)
3300	50	<a href="#">338TMA050M</a>	0.0904	1660	22x41
3300	63	<a href="#">338TMA063M</a>	0.0804	1740	22x51
4700	6.3	<a href="#">478TMA6R3M</a>	0.0127	1060	13x31
4700	10	<a href="#">478TMA010M</a>	0.113	1220	16x31
4700	16	<a href="#">478TMA016M</a>	0.099	1300	16x31
4700	25	<a href="#">478TMA025M</a>	0.085	1540	18x41
4700	35	<a href="#">478TMA035M</a>	0.078	1740	22x41
4700	50	<a href="#">478TMA050M</a>	0.071	1860	22x51
6800	10	<a href="#">688TMA010M</a>	0.0878	1370	16x31
6800	16	<a href="#">688TMA016M</a>	0.078	1620	16x41
6800	25	<a href="#">688TMA025M</a>	0.0683	1810	22x41

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR (Ω) 120 Hz, +20°C	Maximum RMS Ripple Current (mA) 120 Hz, +105°C	Dims DxL (mm)
6800	35	<a href="#">688TMA035M</a>	0.0634	1910	22x51
10000	6.3	<a href="#">109TMA6R3M</a>	0.076	1620	16x41
10000	10	<a href="#">109TMA010M</a>	0.0696	1690	18x41
10000	16	<a href="#">109TMA016M</a>	0.063	1900	22x41
10000	25	<a href="#">109TMA025M</a>	0.0729	1980	22x51
15000	6.3	<a href="#">159TMA6R3M</a>	0.062	1740	18x41
15000	10	<a href="#">159TMA010M</a>	0.0575	1950	22x41
15000	16	<a href="#">159TMA016M</a>	0.053	2050	22x51
22000	6.3	<a href="#">229TMA6R3M</a>	0.054	2000	22x41
22000	10	<a href="#">229TMA010M</a>	0.053	2080	22x51