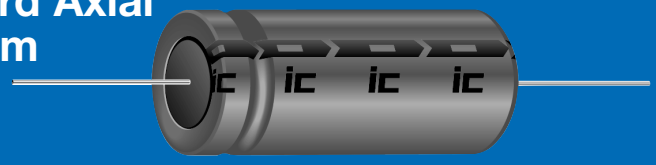
TTA

+85°C Standard Axial Lead Aluminum Electrolytic Capacitors



For all general purpose applications

FEATURES

- *High ripple current ratings*
- *Wide capacitance range: 0.47 µF to 22,000 µF*
- *Wide voltage range: 10 WVDC to 450 WVDC*
- *Solvent tolerant end seals standard (≤250 WVDC)*

SPECIFICATIONS

Capacitance Tolerance		**±20% at 120Hz, 20°C**											
Operating Temperature Range		**-40°C to +85°C**										**-25°C to +85°C**	
Dissipation Factor 120Hz, 20°C	**WVDC**	**10**	**16**	**25**	**35**	**50**	**63**	**80**	**100**	**160**	**250**	**350**	**450**
	tan δ	.20	.16	.14	.12	.10	.09	.09	.08	.20	.20	.20	.25
		Note: For above D.F. specifications, add .02 for every 1,000 µF above 1,000 µF											
Impedance Ratio (Max.) @120Hz	**WVDC**	**10**	**16**	**25**	**35**	**50**	**63**	**80**	**100**	**160**	**250**	**350**	**450**
	-25°C/20°C	3	2	2	2	2	2	2	2	3	3	3	5
	-40°C/20°C	8	6	4	3	3	3	3	3	6	6	6	-

Leakage Current	**WVDC**	**≤ 100 WVDC**		**100 < WVDC ≤ 450**	
	Time	**1 minute**	**2 minutes**	**1 minute**	
		.03 CV or 4 µA	.01 CV or 3 µA	CV≤ 1000 .04 CV + 100µA	CV> 1000 0.1 CV + 40µA
		whichever is greater			
Load Life		**2,000 hours at 85°C with rated WVDC**			
		Capacitance change Dissipation factor Leakage current	< 20% of initial measured value <200% of initial specified value <Initial specified value		
Shelf life		1,000 hours at 85°C with no voltage applied. Units will meet load life specification.			

Ripple Current Multipliers

Capacitance (µF)	Frequency (Hz)						Temperature (°C)			
	50	120	400	1k	10k	50k +	+85	+70	+60	+30
C≤10	0.8	1.0	1.3	1.45	1.65	1.7	1.0	1.3	1.5	1.8
10<C≤100	0.8	1.0	1.23	1.36	1.48	1.53	1.0	1.3	1.5	1.8
100<C≤1000	0.8	1.0	1.16	1.25	1.35	1.38	1.0	1.3	1.5	1.8
C>1000	0.8	1.0	1.11	1.17	1.25	1.28	1.0	1.3	1.5	1.8

SPECIAL ORDER OPTIONS

(See Pages 33 thru 37)

• *Special tolerances: ±10% (K), -10% + 30% (Q)* • *Tape and Reel* • *Epoxy end seal* • *Polyester sleeve*

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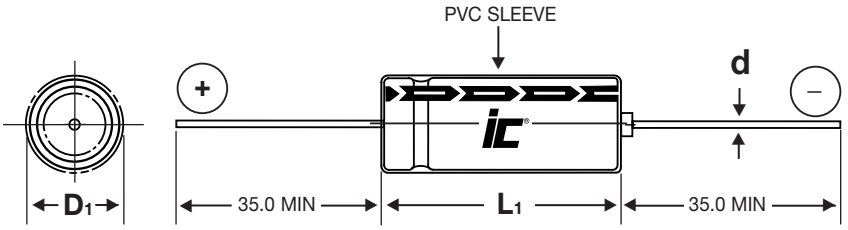
PHYSICAL DIMENSIONS

WVDC (SV) / (µF)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	80 (100)	100 (125)	160 (200)	250 (300)	350 (400)	450 (500)
0.47	→	→	→	→	→	→	→	5x12.5				
1.0	→	→	→	→	5x12.5	→	→	5x12.5	6.3x12.5	→	6.3x16	8x16
2.2	→	→	→	→	5x12.5	→	→	5x12.5	6.3x16	8x16	8x16	10x20
3.3	→	→	→	→	5x12.5	→	→	5x12.5	8x16	8x16	8x20	8x20
4.7	→	→	→	→	5x12.5	→	→	5x12.5	8x16	8x20	8x20	10x25
10	→	→	→	5x12.5	5x12.5	5x12.5	→	6.3x12.5	8x20	10x20	12.5x25	12.5x25
15	→	→	→	→	5x12.5							
22	→	5x12.5	→	5x12.5	6.3x12.5	→	→	8x16	10x25	12.5x25	12.5x30	16x30
33	→	→	5x12.5	→	6.3x16	→	→	8x16	12.5x25	12.5x30	16x31.5	16x40
47	→	5x12.5	6.3x12.5	6.3x16	6.3x16	8x16	→	8x20	12.5x30	16x30	16x40	22x40
68	→	6.3x16	→	8x16	→	8x20						
100	6.3x12.5	→	6.3x16	8x16	8x16	8x20	→	10x25	16x30	16x40	18x40	22x50
150	→	→	8x16	8x20	10x16	10x20	→	12.5x25				
220	→	8x16	8x16	8x20	10x20	10x25	→	12.5x25	22x40	22x40		
330	→	8x16	8x20	→	10x25	12.5x25	→	12.5x30				
470	8x16	8x20	10x20	10x25	12.5x25	12.5x30	→	16x30				
1,000	10x20	10x25	12.5x25	12.5x25	16x30	16x30	16x40	18x40				
1,500	→	→	12.5x25	16x30	16x40							
2,200	12.5x25	12.5x30	16x30	16x30	16x40	18x40	22x50	25x50				
3,300	12.5x30	16x30	16x30	16x40	22x40	22x50						
4,700	16x30	16x31.5	16x40	22x40	22x50	25x50						
6,800	→	16x40	18x40	22x50								
10,000	18x40	18x40	22x50	25x50								
15,000	→	22x50	22x50									
22,000	→	22x50										

Convert to inches, divide by 25.4

DxL (mm)



LEAD INFORMATION VS. CASE DIAMETER

D	5.0	6.3	8.0	10.0	12.5	16.0	18.0	22.0	25.0
d	0.6	0.6	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_1=D+B Max.
D ≤ 18 &V≤ 100, L_1 = L+1.0 mm
D ≤ 18 &V> 100, L_1 = L+2.0 mm
D > 18 L_1= L+2.0 mm

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

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STANDARD PART LISTING

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
0.47	100	**474TTA100M**	705.474	12	5x12.5
1.0	50	**105TTA050M**	165.66	12	5x12.5
1.0	100	**105TTA100M**	331.573	21	5x12.5
1.0	160	**105TTA160M**	331.573	14	6.3x12.5
1.0	350	**105TTA350M**	331.573	15	6.3x16
1.0	450	**105TTA450M**	414.66	16	8x16
2.2	50	**225TTA050M**	75.58	24	5x12.5
2.2	100	**225TTA100M**	150.719	28	5x12.5
2.2	160	**225TTA160M**	150.715	23	6.3x16
2.2	250	**225TTA250M**	150.715	27	8x16
2.2	350	**225TTA350M**	150.715	27	8x16
2.2	450	**225TTA450M**	188.394	31	10x20
3.3	50	**335TTA050M**	50.238	30	5x12.5
3.3	100	**335TTA100M**	100.477	35	5x12.5
3.3	160	**335TTA160M**	100.477	33	8x16
3.3	250	**335TTA250M**	100.477	35	8x16
3.3	350	**335TTA350M**	100.477	37	8x20
3.3	450	**335TTA450M**	125.596	38	8x20
4.7	50	**475TTA050M**	35.274	36	5x12.5
4.7	100	**475TTA100M**	70.547	42	5x12.5
4.7	160	**475TTA160M**	70.547	39	8x16
4.7	250	**475TTA250M**	70.547	45	8x20
4.7	350	**475TTA350M**	70.547	50	8x20
4.7	450	**475TTA450M**	88.184	50	10x25
10	35	**106TTA035M**	19.894	47	5x12.5
10	50	**106TTA050M**	16.579	52	5x12.5
10	63	**106TTA063M**	16.579	56	5x12.5
10	100	**106TTA100M**	33.157	68	6.3x12.5
10	160	**106TTA160M**	33.157	63	8x20
10	250	**106TTA250M**	33.157	70	10x20
10	350	**106TTA350M**	33.157	90	12.5x25
10	450	**106TTA450M**	41.447	85	12.5x25
15	50	**156TTA050M**	11.052	70	5x12.5
22	16	**226TTA016M**	12.011	62	5x12.5
22	35	**226TTA035M**	9.043	72	5x12.5
22	50	**226TTA050M**	7.536	90	6.3x12.5
22	100	**226TTA100M**	15.072	145	8x16
22	160	**226TTA160M**	15.072	130	10x25

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
22	250	**226TTA250M**	15.072	140	12.5x25
22	350	**226TTA350M**	15.072	150	12.5x30
22	450	**226TTA450M**	18.839	150	16x30
33	25	**336TTA025M**	7.536	85	5x12.5
33	50	**336TTA050M**	5.024	115	6.3x16
33	100	**336TTA100M**	10.048	150	8x16
33	160	**336TTA160M**	10.048	170	12.5x25
33	250	**336TTA250M**	10.048	190	12.5x30
33	350	**336TTA350M**	10.048	210	16x31.5
33	450	**336TTA450M**	12.56	230	16x40
47	16	**476TTA016M**	5.947	95	5x12.5
47	25	**476TTA025M**	5.291	125	6.3x12.5
47	35	**476TTA035M**	4.233	125	6.3x16
47	50	**476TTA050M**	3.527	145	6.3x16
47	63	**476TTA063M**	3.527	170	8x16
47	100	**476TTA100M**	7.055	192	8x20
47	160	**476TTA160M**	5.197	225	12.5x30
47	250	**476TTA250M**	7.055	255	16x30
47	350	**476TTA350M**	7.055	290	16x40
47	450	**476TTA450M**	8.818	300	22x40
68	16	**686TTA016M**	4.145	150	6.3x16
68	35	**686TTA035M**	2.926	200	8x16
68	63	**686TTA063M**	2.438	250	8x20
100	10	**107TTA010M**	3.316	150	6.3x12.5
100	25	**107TTA025M**	2.487	180	6.3x16
100	35	**107TTA035M**	1.989	210	8x16
100	50	**107TTA050M**	1.658	230	8x16
100	63	**107TTA063M**	1.658	265	8x20
100	100	**107TTA100M**	3.316	345	10x25
100	160	**107TTA160M**	3.316	420	16x30
100	250	**107TTA250M**	3.316	430	16x40
100	350	**107TTA350M**	3.316	400	18x40
100	450	**107TTA450M**	4.145	500	22x50
150	25	**157TTA025M**	1.658	260	8x16
150	35	**157TTA035M**	1.326	270	8x20
150	50	**157TTA050M**	1.105	285	10x16
150	63	**157TTA063M**	1.105	310	10x20
150	100	**157TTA100M**	2.211	515	12.5x25

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Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
220	16	**227TTA016M**	1.281	260	8x16
220	25	**227TTA025M**	1.13	290	8x16
220	35	**227TTA035M**	0.904	345	8x20
220	50	**227TTA050M**	0.754	440	10x20
220	63	**227TTA063M**	0.754	490	10x25
220	100	**227TTA100M**	1.005	560	12.5x25
220	160	**227TTA160M**	1.507	660	22x40
220	250	**227TTA250M**	1.507	680	22x40
330	16	**337TTA016M**	0.854	320	8x16
330	25	**337TTA025M**	0.754	385	8x20
330	50	**337TTA050M**	0.502	565	10x25
330	63	**337TTA063M**	0.502	660	12.5x25
330	100	**337TTA100M**	1.005	770	12.5x30
470	10	**477TTA010M**	0.706	370	8x16
470	16	**477TTA016M**	0.5997	450	8x20
470	25	**477TTA025M**	0.529	560	10x20
470	35	**477TTA035M**	0.423	640	10x25
470	50	**477TTA050M**	0.353	740	12.5x25
470	63	**477TTA063M**	0.353	845	12.5x30
470	100	**477TTA100M**	0.706	970	16x30
1,000	10	**108TTA010M**	0.332	665	10x20
1,000	16	**108TTA016M**	0.282	785	10x25
1,000	25	**108TTA025M**	0.249	935	12.5x25
1,000	35	**108TTA035M**	0.199	1050	12.5x25
1,000	50	**108TTA050M**	0.166	1255	16x30
1,000	63	**108TTA063M**	0.166	1330	16x30
1,000	80	**108TTA080M**	0.149	1500	16x40
1,000	100	**108TTA100M**	0.332	1650	18x40
1,500	25	**158TTA025M**	0.188	1150	12.5x25
1,500	35	**158TTA035M**	0.155	1280	16x30
1,500	50	**158TTA050M**	0.133	1480	16x40

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz,+20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimension D x L (mm)
2,200	10	**228TTA010M**	0.181	1120	12.5x25
2,200	16	**228TTA016M**	0.158	1280	12.5x30
2,200	25	**228TTA025M**	0.143	1480	16x30
2,200	35	**228TTA035M**	0.121	1580	16x30
2,200	50	**228TTA050M**	0.106	1920	16x40
2,200	63	**228TTA063M**	0.098	2158	18x40
2,200	80	**228TTA080M**	0.106	2260	22x50
2,200	100	**228TTA100M**	0.181	2590	25x50
3,300	10	**338TTA010M**	0.131	1435	12.5x30
3,300	16	**338TTA016M**	0.116	1610	16x30
3,300	25	**338TTA025M**	0.106	1910	16x30
3,300	35	**338TTA035M**	0.09	2050	16x40
3,300	50	**338TTA050M**	0.08	2350	22x40
3,300	63	**338TTA063M**	0.08	2450	22x50
4,700	10	**478TTA010M**	0.099	1730	16x30
4,700	16	**478TTA016M**	0.088	2060	16x31.5
4,700	25	**478TTA025M**	0.081	2170	16x40
4,700	35	**478TTA035M**	0.064	2470	22x40
4,700	50	**478TTA050M**	0.064	2645	22x50
4,700	63	**478TTA063M**	0.064	3090	25x50
6,800	16	**688TTA016M**	0.071	2300	16x40
6,800	25	**688TTA025M**	0.066	2560	18x40
6,800	35	**688TTA035M**	0.059	2720	22x50
10,000	10	**109TTA010M**	0.033	2340	18x40
10,000	16	**109TTA016M**	0.058	2680	18x40
10,000	25	**109TTA025M**	0.063	2900	22x50
10,000	35	**109TTA035M**	0.05	3500	25x50
15,000	16	**159TTA016M**	0.05	2890	22x50
15,000	25	**159TTA025M**	0.048	3700	22x50
22,000	16	**229TTA016M**	0.045	3600	22x50