

TTA

+ 85°C Standard Axial Lead Aluminum Electrolytic Capacitors



For all general purpose applications

FEATURES

- High ripple current ratings
- Wide capacitance range: 0.47 μ F to 22000 μ F
- Wide voltage range: 10 WVDC to 450 WVDC
- Solvent tolerant end seals standard (250 WVDC)

SPECIFICATIONS

Capacitance Tolerance		$\pm 20\%$ at 120Hz, 20°C												
Operating Temperature Range		-40°C to +85°C											-25°C to +85°C	
Dissipation Factor 120Hz, 25°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 μ F above 1,000 μ F														
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 μ A			.01 CV or 3 μ A			CV 1000 .04 CV + 100 μ A			CV > 1000 0.1 CV + 40 μ A			
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 (μ f)	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 7 thru 8)

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



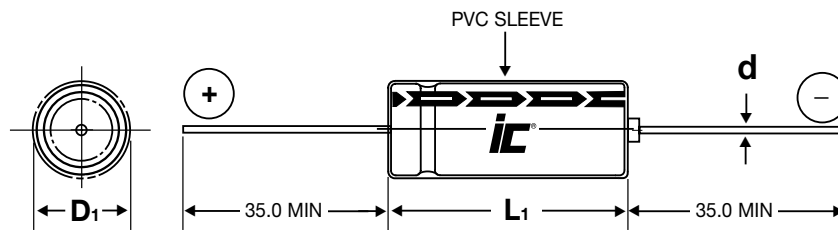
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PHYSICAL DIMENSIONS

WVDC (SV) (μF)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	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	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	25x60						
6,800		16x40	18x40	22x50								
10,000	18x40	18x40	22x50	25x50								
15,000		22x50	25x50									
22,000		22x50										

Convert to inches, divide by 25.4

DxL (mm)



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 (μ F)	VVDC	iC [®] PART NUMBER	Maximum ESR	Maximum RMS Ripple Current (mA)	Dimension D x L (mm)
			120Hz,+20°C	120Hz,+85°C	
0.47	100	474TTA100M	282.19	12	5x12.5
1.0	50	105TTA050M	165.79	12	5x12.5
1.0	100	105TTA100M	132.63	21	5x12.5
1.0	160	105TTA160M	331.57	14	6.3x12.5
1.0	350	105TTA350M	331.57	15	6.3x16
1.0	450	105TTA450M	414.47	16	8x16
2.2	50	225TTA050M	75.36	24	5x12.5
2.2	100	225TTA100M	60.29	28	5x12.5
2.2	160	225TTA160M	150.71	23	6.3x16
2.2	250	225TTA250M	150.71	27	8x16
2.2	350	225TTA350M	150.71	27	8x16
2.2	450	225TTA450M	188.39	31	10x20
3.3	50	335TTA050M	50.24	30	5x12.5
3.3	100	335TTA100M	40.19	35	5x12.5
3.3	160	335TTA160M	100.48	33	8x16
3.3	250	335TTA250M	100.48	35	8x16
3.3	350	335TTA350M	100.48	37	8x20
3.3	450	335TTA450M	125.60	38	8x20
4.7	50	475TTA050M	35.27	36	5x12.5
4.7	100	475TTA100M	28.22	42	5x12.5
4.7	160	475TTA160M	70.55	39	8x16
4.7	250	475TTA250M	70.55	45	8x20
4.7	350	475TTA350M	70.55	50	8x20
4.7	450	475TTA450M	88.18	50	10x25
10	35	106TTA035M	19.89	47	5x12.5
10	50	106TTA050M	16.58	52	5x12.5
10	63	106TTA063M	14.92	56	5x12.5
10	100	106TTA100M	13.26	68	6.3x12.5
10	160	106TTA160M	33.16	63	8x20
10	250	106TTA250M	33.16	70	10x20
10	350	106TTA350M	33.16	90	12.5x25
10	450	106TTA450M	41.45	85	12.5x25
15	50	156TTA050M	11.05	70	5x12.5
22	16	226TTA016M	12.06	62	5x12.5
22	35	226TTA035M	9.04	72	5x12.5
22	50	226TTA050M	7.54	90	6.3x12.5
22	100	226TTA100M	6.03	145	8x16
22	160	226TTA160M	15.07	130	10x25

Capacitance (μ F)	VVDC	iC [®] PART NUMBER	Maximum ESR	Maximum RMS Ripple Current (mA)	Dimension D x L (mm)
			120Hz,+20°C	120Hz,+85°C	
22	250	226TTA250M	15.07	140	12.5x25
22	350	226TTA350M	15.07	150	12.5x30
22	450	226TTA450M	18.84	150	16x30
33	25	336TTA025M	7.03	85	5x12.5
33	50	336TTA050M	5.02	115	6.3x16
33	100	336TTA100M	4.02	150	8x16
33	160	336TTA160M	10.05	170	12.5x25
33	250	336TTA250M	10.05	190	12.5x30
33	350	336TTA350M	10.05	210	16x31.5
33	450	336TTA450M	12.56	230	16x40
47	16	476TTA016M	5.64	95	5x12.5
47	25	476TTA025M	4.94	125	6.3x12.5
47	35	476TTA035M	4.23	125	6.3x16
47	50	476TTA050M	3.53	145	6.3x16
47	63	476TTA063M	3.17	170	8x16
47	100	476TTA100M	2.82	192	8x20
47	160	476TTA160M	7.05	225	12.5x30
47	250	476TTA250M	7.05	255	16x30
47	350	476TTA350M	7.05	290	16x40
47	450	476TTA450M	8.82	300	22x40
68	16	686TTA016M	3.90	150	6.3x16
68	35	686TTA035M	2.93	200	8x16
68	63	686TTA063M	2.19	250	8x20
100	10	107TTA010M	3.32	150	6.3x12.5
100	25	107TTA025M	2.32	180	6.3x16
100	35	107TTA035M	1.99	210	8x16
100	50	107TTA050M	1.66	230	8x16
100	63	107TTA063M	1.49	265	8x20
100	100	107TTA100M	1.33	345	10x25
100	160	107TTA160M	3.32	420	16x30
100	250	107TTA250M	3.32	430	16x40
100	350	107TTA350M	3.32	400	18x40
100	450	107TTA450M	4.14	500	22x50
150	25	157TTA025M	1.55	260	8x16
150	35	157TTA035M	1.33	270	8x20
150	50	157TTA050M	1.11	285	10x16
150	63	157TTA063M	0.99	310	10x20
150	100	157TTA100M	0.88	515	12.5x25



STANDARD PART LISTING

Capacitance (μ F)	WVDC	iC [®] PART NUMBER	Maximum ESR	Maximum RMS Ripple Current (mA)	Dimension D x L (mm)
			120Hz, +20°C	120Hz, +85°C	
220	16	227TTA016M	1.21	260	8x16
220	25	227TTA025M	1.06	290	8x16
220	35	227TTA035M	0.90	345	8x20
220	50	227TTA050M	0.75	440	10x20
220	63	227TTA063M	0.68	490	10x25
220	100	227TTA100M	0.60	560	12.5x25
220	160	227TTA160M	1.51	660	22x40
220	250	227TTA250M	1.51	680	22x40
330	10	337TTA010M	1.00	315	8x16
330	16	337TTA016M	0.80	320	8x16
330	25	337TTA025M	0.70	385	8x20
330	50	337TTA050M	0.50	565	10x25
330	63	337TTA063M	0.45	660	12.5x25
330	100	337TTA100M	0.40	770	12.5x30
470	10	477TTA010M	0.71	370	8x16
470	16	477TTA016M	0.56	450	8x20
470	25	477TTA025M	0.49	560	10x20
470	35	477TTA035M	0.42	640	10x25
470	50	477TTA050M	0.35	740	12.5x25
470	63	477TTA063M	0.32	845	12.5x30
470	100	477TTA100M	0.28	970	16x30
1,000	10	108TTA010M	0.33	665	10x20
1,000	16	108TTA016M	0.27	785	10x25
1,000	25	108TTA025M	0.23	935	12.5x25
1,000	35	108TTA035M	0.20	1050	12.5x25
1,000	50	108TTA050M	0.17	1255	16x30
1,000	63	108TTA063M	0.15	1330	16x30
1,000	80	108TTA080M	0.15	1500	16x40
1,000	100	108TTA100M	0.13	1650	18x40
1,500	25	158TTA025M	0.18	1150	12.5x25
1,500	35	158TTA035M	0.15	1280	16x30

NOTE 1: WVDC: MAXIMUM RATED DC WORKING VOLTAGE AT +85°C.

NOTE 2: SVDC: MAXIMUM RATED DC SURGE VOLTAGE AT +85°C.

NOTE 3: DISSIPATION FACTOR (TAN δ) MAXIMUM; 120Hz, +20°C.

NOTE 4: ESR: MAXIMUM EQUIVALENT SERIES RESISTANCE; 120Hz, +20°C
MINIMUM CAPACITANCE, MAXIMUM DISSIPATION FACTOR.

Capacitance (μ F)	WVDC	iC [®] PART NUMBER	Maximum ESR	Maximum RMS Ripple Current (mA)	Dimension D x L (mm)
			120Hz, +20°C	120Hz, +85°C	
1,500	50	158TTA050M	0.13	1480	16x40
2,200	10	228TTA010M	0.18	1120	12.5x25
2,200	16	228TTA016M	0.15	1280	12.5x30
2,200	25	228TTA025M	0.14	1480	16x30
2,200	35	228TTA035M	0.12	1580	16x30
2,200	50	228TTA050M	0.11	1920	16x40
2,200	63	228TTA063M	0.10	4158	18x40
2,200	80	228TTA080M	0.10	2260	22x50
2,200	100	228TTA100M	0.09	2590	25x50
3,300	10	338TTA010M	0.13	1435	12.5x30
3,300	16	338TTA016M	0.11	1610	16x30
3,300	25	338TTA025M	0.10	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	0.10	1730	16x30
4,700	16	478TTA016M	0.08	2060	16x31.5
4,700	25	478TTA025M	0.08	2170	16x40
4,700	35	478TTA035M	0.07	2470	22x40
4,700	50	478TTA050M	0.06	2645	22x50
4,700	63	478TTA063M	0.053	3090	25x60
6,800	16	688TTA016M	0.07	2300	16x40
6,800	25	688TTA025M	0.06	2560	18x40
6,800	35	688TTA035M	0.06	2720	22x50
10,000	10	109TTA010M	0.06	2340	18x40
10,000	16	109TTA016M	0.06	2680	18x40
10,000	25	109TTA025M	0.05	2900	22x50
10,000	35	109TTA035M	0.05	3500	25x50
15,000	16	159TTA016M	0.05	2890	22x50
15,000	25	159TTA025M	0.05	3700	25x50
22,000	16	229TTA016M	0.04	3600	22x50

NOTE 5: MAXIMUM LEAKAGE CURRENT; RATED WVDC, 1MINUTE, +20°C.

NOTE 6: RMS RIPPLE CURRENT; 120Hz, +85°C.

NOTE 7: CAPACITANCE TOLERANCE IS MEASURED AT 120Hz, +20°C.

NOTE 8: ALL MEASUREMENTS ARE PERFORMED USING THE BRIDGE
METHOD.

