

### T-HA Series 105°C, 3000 hours

- Long Life - endurance rating of 3000 hours at 105°C
- 4 terminal mounting provides stability and keyed polarity
- Extended higher CV ratings

RoHS Compliant



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	820~150000µF	330~1800µF
Capacitance Tolerance:	± 20%	
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:	16    25    35    50    63    80    100    160 ~ 450
	Max. D.F. (%):	50    40    35    30    25    20    20    15
For capacitance values > 33000µF, add the value of: $\frac{\text{(rated cap. } \mu\text{F)} - 33000}{1000}$		
Leakage Current:	3√CV (µA) max. after 5 minutes; C = Capacitance in µF, V = WV	
Ripple Current Multipliers:	Frequency (Hz):	50    60    100-120    500    1k    10k
	16-100WV:	0.93    0.95    1.0    1.05    1.08    1.15
	160-450WV:	0.75    0.8    1.0    1.2    1.25    1.4
		Ripple Current Ambient Temperature Factors**
		Temperature (°C): 105°C    85°C    70°C    60°C    ≤45°C
		Multiplier: 1.0    1.7    2.0    2.2    2.35
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 4)	

\*\*Use of temperature ripple current multipliers may limit life to the hours specified for the maximum operating temperature.

#### Part Number System

RoHS compliant PVC sleeve and top plate is standard.

<b>E</b>	<b>C</b>	<b>E</b>	<b>T</b>		<b>A</b>				
Terminals					Series Code	Capacitance Code			
Prefix	No. of Pins								
ECET	4								

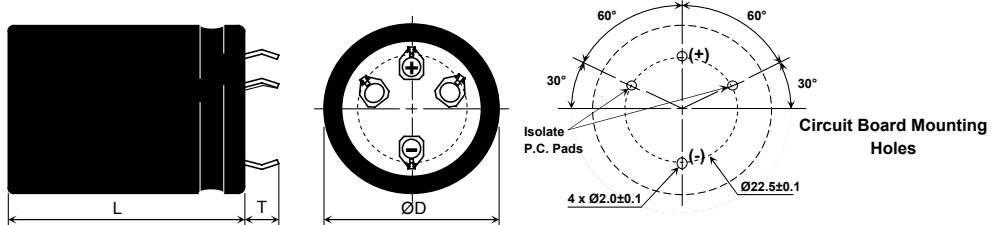
Voltage Code											
1C	1E	1V	1H	1J	1K	2A	2D	2E	2V	2G	2W
16	25	35	50	63	80	100	200	250	350	400	450

Diameter Code	
Dia.	Code
35	E
40	F

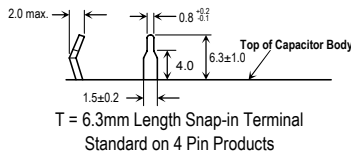
Terminal Suffix Code		
Terminal Length & Type	Standard Ratings	Extended Ratings
6.3mm Snap-in (Standard):	A	X

#### Dimensions in millimeters

4 Pin Mounting Style



Pin Dimensions



**T-HA Standard Ratings**

Part numbers shown with 6.3mm Length Snap-in Terminals

Cap. ( $\mu$ F)	Size (mm) D x L	Max 105°C R.C. ( $A_{rms}$ )		20°C ESR ( $\Omega$ , max.)		Panasonic Part Number 4 Pin Style
		120Hz	10kHz~	120Hz	20kHz	
<b>16 VDC Working, 20 VDC Surge</b>						
39000	35 x 40	5.10	5.87	0.022	0.020	ECET1CA393EA
47000	40 x 40	5.50	6.33	0.020	0.018	ECET1CA473FA
56000	35 x 50	6.00	6.90	0.019	0.017	ECET1CA563EA
68000	35 x 63	6.62	7.61	0.017	0.015	ECET1CA683EA
	40 x 50	7.29	8.38	0.015	0.014	ECET1CA683FA
82000	40 x 63	7.66	8.81	0.017	0.015	ECET1CA823FA
100000	35 x 80	8.03	9.23	0.015	0.013	ECET1CA104EA
120000	35 x 105	8.71	10.02	0.014	0.012	ECET1CA124EA
	40 x 80	8.79	10.11	0.014	0.012	ECET1CA124FA
150000	40 x 105	9.88	11.36	0.013	0.012	ECET1CA154FA
<b>25 VDC Working, 32 VDC Surge</b>						
27000	35 x 40	4.80	5.52	0.018	0.017	ECET1EA273EA
33000	35 x 50	5.50	6.33	0.018	0.016	ECET1EA333EA
	40 x 40	5.50	6.33	0.018	0.016	ECET1EA333FA
47000	35 x 63	6.56	7.54	0.017	0.015	ECET1EA473EA
	40 x 50	6.47	7.44	0.015	0.014	ECET1EA473FA
56000	35 x 80	7.25	8.34	0.015	0.013	ECET1EA563EA
	40 x 63	7.17	8.25	0.014	0.013	ECET1EA563FA
82000	35 x 105	8.58	9.87	0.013	0.012	ECET1EA823EA
	40 x 80	8.68	9.98	0.013	0.012	ECET1EA823FA
100000	40 x 105	9.76	11.22	0.012	0.010	ECET1EA104FA
<b>35 VDC Working, 44 VDC Surge</b>						
18000	35 x 40	4.30	4.95	0.028	0.021	ECET1VA183EA
22000	35 x 50	5.00	5.75	0.023	0.017	ECET1VA223EA
	40 x 40	5.00	5.75	0.023	0.017	ECET1VA223FA
27000	35 x 63	5.53	6.36	0.025	0.018	ECET1VA273EA
	40 x 50	5.44	6.26	0.020	0.015	ECET1VA273FA
33000	40 x 63	6.61	7.60	0.019	0.014	ECET1VA333FA
39000	35 x 80	6.52	7.50	0.019	0.014	ECET1VA393EA
47000	35 x 105	8.07	9.28	0.017	0.013	ECET1VA473EA
	40 x 80	7.79	8.96	0.018	0.013	ECET1VA473FA
68000	40 x 105	9.27	10.66	0.016	0.012	ECET1VA683FA
<b>50 VDC Working, 63 VDC Surge</b>						
10000	35 x 40	4.00	4.60	0.033	0.025	ECET1HA103EA
15000	35 x 50	4.80	5.52	0.022	0.018	ECET1HA153EA
	40 x 40	4.80	5.52	0.022	0.018	ECET1HA153FA
18000	35 x 63	5.27	6.06	0.020	0.016	ECET1HA183EA
	40 x 50	5.15	5.92	0.016	0.013	ECET1HA223FA
27000	35 x 80	6.16	7.08	0.015	0.012	ECET1HA273EA
	40 x 63	6.05	6.96	0.015	0.012	ECET1HA273FA
33000	35 x 105	7.23	8.31	0.013	0.010	ECET1HA333EA
39000	40 x 80	7.55	8.68	0.014	0.011	ECET1HA393FA
47000	40 x 105	8.18	9.41	0.012	0.010	ECET1HA473FA
<b>63 VDC Working, 79 VDC Surge</b>						
6800	35 x 40	3.60	4.14	0.049	0.037	ECET1JA682EA
12000	35 x 50	4.40	5.06	0.028	0.023	ECET1JA123EA
	40 x 40	4.52	5.20	0.030	0.026	ECET1JA123FA
15000	35 x 63	4.92	5.66	0.024	0.021	ECET1JA153EA
	40 x 50	4.80	5.52	0.027	0.023	ECET1JA153FA
18000	35 x 80	5.79	6.66	0.022	0.019	ECET1JA183EA
	40 x 63	5.39	6.20	0.023	0.020	ECET1JA183FA
27000	35 x 105	6.53	7.51	0.017	0.014	ECET1JA273EA
	40 x 80	6.59	7.58	0.017	0.014	ECET1JA273FA
39000	40 x 105	7.53	8.66	0.014	0.012	ECET1JA393FA

Aluminum Electrolytic Capacitors

**T-HA Standard Ratings (continued)**

Part numbers shown with 6.3mm Length Snap-in Terminals

Cap. ( $\mu$ F)	Size (mm) D x L	Max 105°C R.C. ( $A_{rms}$ )		20°C ESR ( $\Omega$ , max.)		Panasonic Part Number 4 Pin Style
		120Hz	10kHz~	120Hz	20kHz	
<b>80 VDC Working, 100 VDC Surge</b>						
4700	35 x 40	3.30	3.80	0.049	0.037	ECET1KA472EA
6800	35 x 50	3.90	4.49	0.041	0.031	ECET1KA682EA
	40 x 40	3.90	4.49	0.041	0.031	ECET1KA682FA
8200	35 x 63	4.39	5.05	0.036	0.027	ECET1KA822EA
	40 x 50	4.29	4.93	0.036	0.027	ECET1KA822FA
10000	35 x 80	4.88	5.61	0.031	0.024	ECET1KA103EA
	40 x 63	4.73	5.44	0.033	0.025	ECET1KA103FA
15000	35 x 105	6.13	7.05	0.024	0.018	ECET1KA153EA
	40 x 80	5.97	6.87	0.025	0.019	ECET1KA153FA
22000	40 x 105	6.95	7.99	0.019	0.014	ECET1KA223FA
<b>100 VDC Working, 125 VDC Surge</b>						
3300	35 x 40	3.20	3.68	0.075	0.053	ECET2AA332EA
4700	35 x 50	3.80	4.37	0.053	0.040	ECET2AA472EA
	40 x 40	3.80	4.37	0.053	0.040	ECET2AA472FA
5600	35 x 63	4.06	4.67	0.044	0.033	ECET2AA562EA
6800	40 x 50	4.57	5.26	0.037	0.027	ECET2AA682FA
8200	35 x 80	5.15	5.92	0.030	0.023	ECET2AA822EA
	40 x 63	5.02	5.77	0.030	0.023	ECET2AA822FA
10000	35 x 105	6.38	7.34	0.025	0.019	ECET2AA103EA
12000	40 x 80	6.44	7.41	0.021	0.016	ECET2AA123FA
15000	40 x 105	7.37	8.48	0.017	0.012	ECET2AA153FA
<b>200 VDC Working, 250 VDC Surge</b>						
1200	35 x 40	2.50	3.50	0.133	0.066	ECET2DA122EA
1800	40 x 40	2.70	3.78	0.129	0.077	ECET2DA182FA
2200	35 x 50	2.90	4.06	0.098	0.059	ECET2DA222EA
2700	35 x 63	3.65	5.11	0.080	0.048	ECET2DA272EA
	40 x 50	3.55	4.97	0.086	0.052	ECET2DA272FA
3300	35 x 80	4.52	6.33	0.065	0.039	ECET2DA332EA
	40 x 63	4.40	6.16	0.070	0.042	ECET2DA332FA
4700	35 x 105	5.70	7.98	0.046	0.028	ECET2DA472EA
	40 x 80	5.76	8.06	0.049	0.030	ECET2DA472FA
5600	40 x 105	6.76	9.46	0.041	0.025	ECET2DA562FA
<b>250 VDC Working, 300 VDC Surge</b>						
820	35 x 40	2.20	3.08	0.243	0.133	ECET2EA821EA
1200	35 x 50	2.30	3.22	0.180	0.117	ECET2EA122EA
	40 x 40	2.66	3.72	0.180	0.117	ECET2EA122FA
1500	35 x 63	2.57	3.60	0.144	0.093	ECET2EA152EA
1800	40 x 50	3.15	4.41	0.120	0.078	ECET2EA182FA
2200	35 x 80	3.75	5.25	0.098	0.064	ECET2EA222EA
	40 x 63	3.68	5.15	0.098	0.064	ECET2EA222FA
2700	35 x 105	4.80	6.72	0.080	0.052	ECET2EA272EA
3300	35 x 105	4.86	6.80	0.065	0.042	ECET2EA332EA
	40 x 80	4.86	6.80	0.065	0.042	ECET2EA332FA
3900	40 x 105	5.61	7.85	0.055	0.036	ECET2EA392FA
<b>350 VDC Working, 400 VDC Surge</b>						
470	35 x 40	2.00	2.80	0.459	0.183	ECET2VA471EA
680	35 x 50	2.15	3.01	0.317	0.127	ECET2VA681EA
	40 x 40	2.30	3.22	0.317	0.127	ECET2VA681FA
820	35 x 63	2.65	3.71	0.263	0.105	ECET2VA821EA
	40 x 50	2.65	3.71	0.263	0.105	ECET2VA821FA
1200	35 x 80	3.22	4.51	0.180	0.072	ECET2VA122EA
	40 x 63	3.22	4.51	0.180	0.072	ECET2VA122FA
1500	35 x 105	4.78	6.69	0.144	0.057	ECET2VA152EA
	40 x 80	3.75	5.25	0.144	0.057	ECET2VA152FA
1800	40 x 105	5.23	7.32	0.120	0.048	ECET2VA182FA

### Aluminum Electrolytic Capacitors

#### T-HA Standard Ratings (continued)

Part numbers shown with 6.3mm Length Snap-in Terminals

Cap. ( $\mu$ F)	Size (mm) D x L	Max 105°C R.C. ( $A_{rms}$ )		20°C ESR ( $\Omega$ , max.)		Panasonic Part Number 4 Pin Style
		120Hz	10kHz~	120Hz	20kHz	
<b>400 VDC Working, 450 VDC Surge</b>						
390	35 x 45	1.55	2.17	0.425	0.170	ECET2GA391EA
470	40 x 40	1.75	2.45	0.353	0.141	ECET2GA471FA
560	35 x 50	1.80	2.52	0.296	0.118	ECET2GA561EA
680	40 x 50	2.17	3.04	0.244	0.098	ECET2GA681FA
820	35 x 63	2.44	3.42	0.202	0.081	ECET2GA821EA
	40 x 50	2.58	3.61	0.202	0.081	ECET2GA821FA
1000	35 x 80	3.00	4.20	0.166	0.066	ECET2GA102EA
	40 x 63	3.00	4.20	0.166	0.066	ECET2GA102FA
1200	35 x 105	3.75	5.25	0.138	0.055	ECET2GA122EA
	40 x 80	3.79	5.31	0.138	0.055	ECET2GA122FA
1500	40 x 105	4.81	6.73	0.111	0.044	ECET2GA152FA
1800	40 x 105	5.06	7.08	0.101	0.041	ECET2GA182FA
<b>450 VDC Working, 500 VDC Surge</b>						
330	35 x 40	1.37	1.92	0.502	0.176	ECET2WA331EA
470	35 x 50	1.74	2.44	0.353	0.123	ECET2WA471EA
	40 x 40	1.68	2.35	0.353	0.123	ECET2WA471FA
560	35 x 63	2.15	3.01	0.296	0.104	ECET2WA561EA
	40 x 50	2.10	2.94	0.296	0.104	ECET2WA561FA
680	40 x 63	2.50	3.50	0.244	0.085	ECET2WA681FA
820	35 x 80	2.70	3.78	0.202	0.071	ECET2WA821EA
1000	35 x 105	3.47	4.86	0.166	0.058	ECET2WA102EA
	40 x 80	3.50	4.90	0.166	0.058	ECET2WA102FA
1200	40 x 105	4.33	6.06	0.138	0.048	ECET2WA122FA

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