

### 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	Ripple Current Ambient Temperature Factors**					
	16-100WV:	0.93	0.95	1.0	1.05	1.08	1.15	Temperature (°C):	105°C	85°C	70°C	60°C	≤45°C
	160-450WV:	0.75	0.8	1.0	1.2	1.25	1.4	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>Prefix</b>	<b>No. of Pins</b>
ECET	4

Series Code: A

Capacitance Code: [ ] [ ] [ ] [ ]

Terminal Suffix Code:

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

Diameter Code:

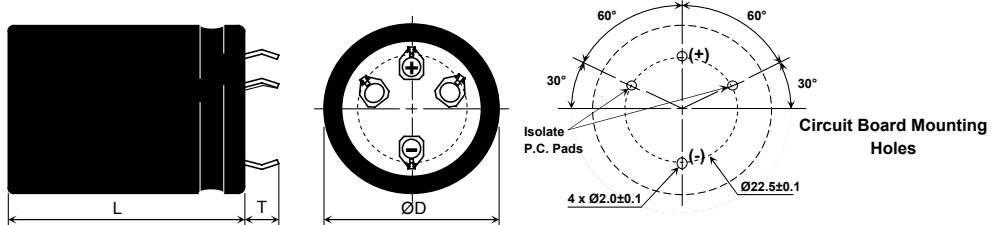
Dia.	Code
35	E
40	F

Voltage Code:

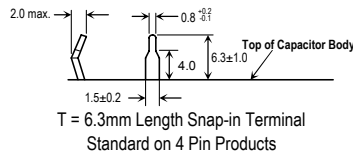
1C	1E	1V	1H	1J	1K	2A	2D	2E	2V	2G	2W
16	25	35	50	63	80	100	200	250	350	400	450

#### 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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