

### T-HA Series 105°C, 3000 hours

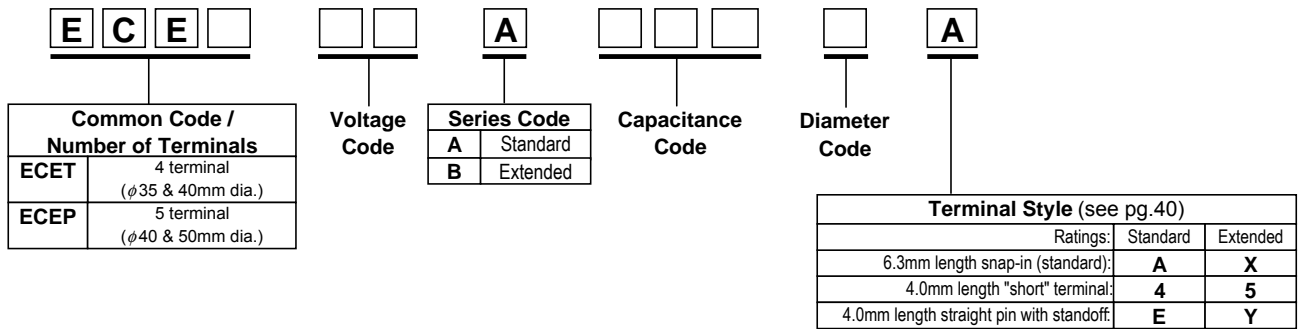
- Long Life - endurance rating of 3000 hours at 105°C
- 4 or 5 terminal mounting provides stability and keyed polarity
- Extended higher CV ratings
- Can vent construction



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	1000~ 250000μF (±20% tolerance)	330 ~ 2700μF (±20% tolerance)
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
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 6)	

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

### Part Number System



### T-HA Standard Ratings

Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A <sub>max</sub> )		Max 20°C ESR (Ω)		Panasonic Part Number
		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
	50 x 50	9.02	10.37	0.015	0.014	ECET1CA124HA
150000	40 x 105	9.88	11.36	0.013	0.012	ECET1CA154FA
	50 x 63	10.15	11.67	0.014	0.013	ECEP1CA154HA
180000	50 x 80	11.02	12.67	0.013	0.012	ECEP1CA184HA
220000	50 x 92	11.71	13.47	0.012	0.011	ECEP1CA224HA
250000	50 x 105	12.31	14.16	0.011	0.010	ECEP1CA254HA
<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
	50 x 50	7.25	8.34	0.015	0.013	ECET1EA563EA
56000	40 x 63	7.17	8.25	0.014	0.013	ECET1EA563FA
	50 x 105	8.58	9.87	0.013	0.012	ECET1EA823EA
82000	40 x 80	8.68	9.98	0.013	0.012	ECET1EA823FA
	50 x 50	9.20	10.58	0.016	0.015	ECEP1EA823HA
	100000	40 x 105	9.76	11.22	0.012	0.010
120000	50 x 63	10.02	11.52	0.015	0.013	ECEP1EA104HA
	50 x 80	10.93	12.57	0.013	0.012	ECEP1EA124HA
150000	50 x 92	11.70	13.46	0.012	0.011	ECEP1EA154HA
180000	50 x 105	12.42	14.28	0.010	0.009	ECEP1EA184HA
<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
	50 x 50	8.25	9.49	0.021	0.016	ECEP1VA473HA
56000	50 x 63	9.07	10.43	0.019	0.014	ECEP1VA563HA
68000	40 x 105	9.27	10.66	0.016	0.012	ECET1VA683FA
	50 x 80	10.07	11.58	0.017	0.013	ECEP1VA683HA
82000	50 x 92	10.89	12.52	0.015	0.011	ECEP1VA823HA
100000	50 x 105	11.75	13.51	0.013	0.010	ECEP1VA104HA
<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
22000	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
	50 x 50	7.75	8.91	0.018	0.014	ECEP1HA333HA
	39000	40 x 80	7.55	8.68	0.014	0.011
47000	50 x 63	8.40	9.66	0.016	0.013	ECEP1HA393HA
	40 x 105	8.18	9.41	0.012	0.010	ECET1HA473FA
56000	50 x 80	9.19	10.57	0.014	0.011	ECEP1HA473HA
	50 x 92	9.79	11.26	0.012	0.009	ECEP1HA563HA
68000	50 x 105	10.42	11.98	0.011	0.009	ECEP1HA683HA

## T-HA Standard Ratings (continued)

Cap. ( $\mu$ F)	Size (mm) D x L	Max 105°C R.C. ( $A_{rms}$ )		Max 20°C ESR ( $\Omega$ )		Panasonic Part Number
		120 Hz	10kHz~	120Hz	20kHz	
<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
22000	50 x 50	6.76	7.77	0.019	0.016	ECEP1JA223HA
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
	50 x 63	7.34	8.44	0.017	0.014	ECEP1JA273HA
33000	50 x 80	8.00	9.20	0.015	0.013	ECEP1JA333HA
39000	40 x 105	7.53	8.66	0.014	0.012	ECET1JA393FA
	50 x 92	8.48	9.75	0.014	0.012	ECEP1JA393HA
47000	50 x 105	8.99	10.34	0.012	0.010	ECEP1JA473HA
<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
12000	50 x 50	6.03	6.93	0.035	0.026	ECEP1KA123HA
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
	50 x 63	6.65	7.65	0.028	0.021	ECEP1KA153HA
18000	50 x 80	7.29	8.38	0.026	0.019	ECEP1KA183HA
22000	40 x 105	6.95	7.99	0.019	0.014	ECET1KA223FA
	50 x 92	7.83	9.00	0.022	0.016	ECEP1KA223HA
27000	50 x 105	8.38	9.64	0.018	0.014	ECEP1KA273HA
<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
	50 x 50	6.14	7.06	0.030	0.023	ECEP2AA822HA
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
	50 x 63	7.17	8.25	0.022	0.017	ECEP2AA123HA
15000	40 x 105	7.37	8.48	0.017	0.012	ECET2AA153FA
	50 x 80	8.01	9.21	0.019	0.014	ECEP2AA153HA
18000	50 x 92	8.64	9.94	0.017	0.012	ECEP2AA183HA
22000	50 x 105	9.32	10.72	0.015	0.011	ECEP2AA223HA
<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
	50 x 50	5.20	7.28	0.075	0.045	ECEP2DA332HA
3900	50 x 50	5.65	7.91	0.064	0.038	ECEP2DA392HX
	50 x 63	5.90	8.26	0.064	0.038	ECEP2DA392HA
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
	50 x 63	6.48	9.07	0.053	0.032	ECEP2DA472HX
	50 x 80	6.82	9.55	0.053	0.032	ECEP2DA472HA
5600	40 x 105	6.76	9.46	0.041	0.025	ECET2DA562FA
	50 x 92	7.68	10.75	0.044	0.027	ECEP2DA562HA
6800	50 x 92	8.46	11.84	0.034	0.020	ECEP2DA682HX
	50 x 105	8.71	12.19	0.034	0.020	ECEP2DA682HA
8200	50 x 105	9.56	13.38	0.028	0.016	ECEP2DA822HA
<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
<b>250 VDC Working, 300 VDC Surge (continued)</b>						
2200	40 x 63	3.68	5.15	0.098	0.064	ECET2EA222FA
	50 x 50	4.35	6.09	0.098	0.064	ECEP2EA222HA
2700	35 x 105	4.80	6.72	0.080	0.052	ECET2EA272EA
	50 x 50	4.80	6.72	0.080	0.052	ECEP2EA272HX
	50 x 63	4.98	6.97	0.080	0.052	ECEP2EA272HA
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
	50 x 63	5.48	7.67	0.065	0.042	ECEP2EA332HA
3900	40 x 105	5.61	7.85	0.055	0.036	ECET2EA392FA
	50 x 80	6.10	8.54	0.055	0.036	ECEP2EA392HA
4300	50 x 92	6.67	9.34	0.050	0.033	ECEP2EA432HA
4700	50 x 92	6.93	9.70	0.046	0.030	ECEP2EA472HX
	50 x 105	7.03	9.84	0.046	0.030	ECEP2EA472HA
5600	50 x 105	7.67	10.74	0.039	0.025	ECEP2EA562HA
<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
1000	50 x 50	3.56	4.98	0.216	0.086	ECEP2VA102HA
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
	50 x 63	4.16	5.82	0.144	0.057	ECEP2VA152HA
1800	40 x 105	5.23	7.32	0.120	0.048	ECET2VA182FA
	50 x 80	5.69	7.97	0.120	0.048	ECEP2VA182HA
2000	50 x 92	6.34	8.88	0.108	0.043	ECEP2VA202HA
2200	50 x 105	7.03	9.84	0.098	0.039	ECEP2VA222HA
<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
	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	50 x 50	3.15	4.41	0.202	0.081	ECEP2GA821HA
	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	50 x 50	3.45	4.83	0.166	0.066	ECEP2GA102HA
	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	50 x 63	4.22	5.91	0.152	0.061	ECEP2GA122HA
	40 x 105	4.81	6.73	0.111	0.044	ECET2GA152FA
1600	50 x 80	5.22	7.31	0.122	0.049	ECEP2GA152HA
	50 x 92	5.69	7.97	0.114	0.046	ECEP2GA162HA
1800	40 x 105	5.06	7.08	0.101	0.041	ECET2GA182FA
	50 x 80	5.50	7.70	0.101	0.041	ECEP2GA182HX
	50 x 105	6.48	9.07	0.101	0.041	ECEP2GA182HA
2200	50 x 92	6.55	9.17	0.082	0.033	ECEP2GA222HA
<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
	50 x 50	2.90	4.06	0.244	0.085	ECEP2WA681HA
820	35 x 80	2.70	3.78	0.202	0.071	ECET2WA821EA
	50 x 50	3.42	4.79	0.222	0.079	ECEP2WA821HX
	50 x 63	3.42	4.79	0.222	0.078	ECEP2WA821HA
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
	50 x 63	3.74	5.24	0.172	0.065	ECEP2WA102HA
1200	40 x 105	4.33	6.06	0.138	0.048	ECET2WA122FA
	50 x 80	4.70	6.58	0.152	0.053	ECEP2WA122HA
1300	50 x 92	5.18	7.25	0.140	0.049	ECEP2WA132HA
1500	50 x 105	6.03	8.44	0.122	0.043	ECEP2WA152HA
1800	50 x 105	6.23	8.72	0.101	0.036	ECEP2WA182HA