

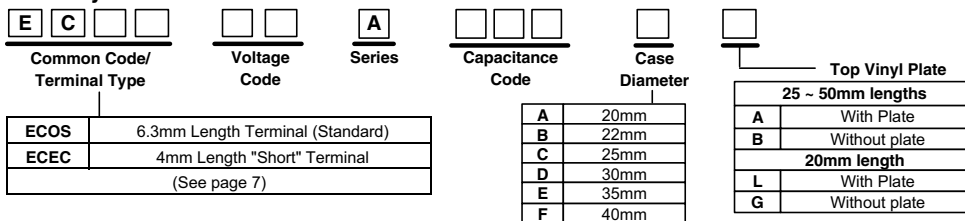
## TS-HA Series two terminal snap-in

- 3000 hour\* life at 105°C with high ripple current capability
- Wide range of case sizes including 20mm, low profile lengths
- **NEW:** 40mm diameter sizes through 100WV.
- Can vent construction



Rated Working Voltage:	10 ~ 250 VDC	385 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	68 ~ 68000μF (±20% tolerance)	33 ~ 470μF (±20% tolerance)
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:	10 16 25 35 50 63 80 100 - 450
	Max. D.F. (%):	55 45 35 30 25 20 17 15
For capacitance values > 33000μF, add the value of: $\frac{(\text{rated cap. } [\mu\text{F}] - 33000)}{1000}$		
Endurance:	3000 hours* at +105°C with maximum specified ripple current (see page 4) *2000 hours for 20mm diameter or 20mm length sizes	

### Part Number System



Ripple Current  
Multipliers:  
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### TS-HA Standard Ratings

Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A <sub>rms</sub> )		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10k~100kHz	120Hz	20kHz	
<b>10 VDC Working, 13 VDC Surge</b>						
6800	20 x 25	1.30	1.50	0.110	0.093	ECOS1AA682AA
8200	20 x 30	1.60	1.84	0.091	0.077	ECOS1AA822AA
10000	20 x 30	1.80	2.07	0.075	0.063	ECOS1AA103AA
12000	20 x 35	2.20	2.53	0.062	0.053	ECOS1AA123AA
15000	20 x 40	2.30	2.65	0.053	0.045	ECOS1AA153AA
4700	22 x 25	0.85	0.98	0.159	0.135	ECOS1AA472BA
6800	22 x 25	1.30	1.50	0.110	0.093	ECOS1AA682BA
10000	22 x 25	1.80	2.07	0.075	0.063	ECOS1AA103BA
12000	22 x 30	2.20	2.53	0.062	0.053	ECOS1AA123BA
15000	22 x 35	2.30	2.65	0.053	0.045	ECOS1AA153BA
18000	22 x 40	2.40	2.76	0.044	0.038	ECOS1AA183BA
22000	22 x 45	2.60	2.99	0.038	0.032	ECOS1AA223BA
27000	22 x 50	3.10	3.57	0.033	0.028	ECOS1AA273BA
15000	25 x 25	2.30	2.65	0.053	0.045	ECOS1AA153CA
18000	25 x 30	2.40	2.76	0.044	0.038	ECOS1AA183CA
22000	25 x 35	2.60	2.99	0.038	0.032	ECOS1AA223CA
27000	25 x 40	3.10	3.57	0.033	0.028	ECOS1AA273CA
33000	25 x 45	3.40	3.91	0.027	0.023	ECOS1AA333CA
39000	25 x 50	3.70	4.26	0.025	0.021	ECOS1AA393CA
22000	30 x 25	2.60	2.99	0.038	0.032	ECOS1AA223DA
27000	30 x 30	3.10	3.57	0.033	0.028	ECOS1AA273DA
33000	30 x 35	3.40	3.91	0.027	0.023	ECOS1AA333DA
39000	30 x 40	3.70	4.26	0.025	0.021	ECOS1AA393DA
47000	30 x 45	4.20	4.83	0.023	0.020	ECOS1AA473DA
56000	30 x 50	5.00	5.75	0.022	0.019	ECOS1AA563DA
27000	35 x 25	3.10	3.57	0.033	0.028	ECOS1AA273EA
33000	35 x 30	3.40	3.91	0.027	0.023	ECOS1AA333EA
39000	35 x 30	3.70	4.26	0.025	0.021	ECOS1AA393EA
47000	35 x 35	4.20	4.83	0.023	0.020	ECOS1AA473EA
56000	35 x 40	5.00	5.75	0.022	0.021	ECOS1AA563EA
68000	35 x 50	5.50	6.33	0.021	0.020	ECOS1AA683EA
62000	40 x 40	5.42	6.23	0.023	0.022	ECOS1AA623FA
82000	40 x 50	7.36	8.46	0.018	0.017	ECOS1AA823FA
<b>16 VDC Working, 20 VDC Surge</b>						
6800	20 x 30	2.20	2.53	0.085	0.068	ECOS1CA682AA
8200	20 x 35	2.40	2.76	0.071	0.057	ECOS1CA822AA
10000	20 x 40	2.60	2.99	0.066	0.053	ECOS1CA103AA
3300	22 x 20	1.30	1.50	0.216	0.173	ECOS1CA332BL
3300	22 x 25	1.30	1.50	0.176	0.141	ECOS1CA332BA
4700	22 x 25	1.52	1.75	0.123	0.099	ECOS1CA472BA
6800	22 x 25	2.20	2.53	0.085	0.068	ECOS1CA682BA
8200	22 x 30	2.40	2.76	0.071	0.057	ECOS1CA822BA
10000	22 x 30	2.60	2.99	0.066	0.053	ECOS1CA103BA
12000	22 x 35	2.90	3.34	0.055	0.044	ECOS1CA123BA
15000	22 x 40	3.20	3.68	0.046	0.037	ECOS1CA153BA
18000	22 x 45	3.50	4.03	0.040	0.034	ECOS1CA183BA
4700	25 x 20	1.60	1.84	0.152	0.121	ECOS1CA472CL
10000	25 x 25	2.60	2.99	0.066	0.053	ECOS1CA103CA
12000	25 x 30	2.90	3.34	0.055	0.044	ECOS1CA123CA
15000	25 x 35	3.20	3.68	0.046	0.037	ECOS1CA153CA
18000	25 x 40	3.50	4.03	0.040	0.034	ECOS1CA183CA
22000	25 x 45	3.80	4.37	0.033	0.028	ECOS1CA223CA
27000	25 x 50	4.20	4.83	0.028	0.025	ECOS1CA273CA
6800	30 x 20	1.80	2.07	0.105	0.084	ECOS1CA682DL
12000	30 x 25	2.90	3.34	0.055	0.044	ECOS1CA123DA
15000	30 x 30	3.20	3.68	0.046	0.037	ECOS1CA153DA
18000	30 x 30	3.50	4.03	0.040	0.034	ECOS1CA183DA
22000	30 x 35	3.80	4.37	0.033	0.028	ECOS1CA223DA
27000	30 x 40	4.20	4.83	0.028	0.025	ECOS1CA273DA
33000	30 x 45	4.70	5.41	0.023	0.020	ECOS1CA333DA
39000	30 x 50	5.10	5.87	0.022	0.020	ECOS1CA393DA
10000	35 x 20	2.40	2.76	0.071	0.057	ECOS1CA103EL
18000	35 x 25	3.50	4.03	0.040	0.034	ECOS1CA183EA
22000	35 x 30	3.80	4.37	0.033	0.028	ECOS1CA223EA
27000	35 x 30	4.20	4.83	0.028	0.025	ECOS1CA273EA
33000	35 x 35	4.70	5.41	0.023	0.020	ECOS1CA333EA
39000	35 x 40	5.10	5.87	0.022	0.020	ECOS1CA393EA
47000	35 x 45	5.50	6.33	0.020	0.018	ECOS1CA473EA
56000	35 x 50	6.00	6.90	0.019	0.017	ECOS1CA563EA
47000	40 x 40	5.50	6.33	0.020	0.018	ECOS1CA473FA
68000	40 x 50	7.29	8.38	0.015	0.014	ECOS1CA683FA





