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TS-UP Series two terminal snap-in

- Compact size for general purpose and industrial applications
- **NEW:** 500 WV ratings, 40mm diameter sizes, extended capacitance ratings
- Wide range of case sizes including 20mm lengths for low profile applications
- Can vent construction



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 500 VDC
Operating Temperature:	-40 ~ +85°C	-25 ~ +85°C
Nominal Capacitance:	120 ~ 68000µF (±20% tolerance)	33 ~ 680µF (±20% tolerance)
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:	16 25 35 50 63 80 100 160 ~ 500
	Max. D.F. (%):	50 40 35 30 25 20 20 15
For capacitance values > 33000µF, add the value of: $\frac{(\text{rated cap. } [\mu\text{F}] - 33000)}{1000}$		
Endurance:	3000 hours* at +85°C with maximum specified ripple current (see page 4) *2000 hours for 20mm diameter or 20mm length sizes	

Part Number System

E C 	 	P	 	 	
Common Code/ Terminal Type	Voltage Code	Series	Capacitance Code	Case Diameter	Suffix, Top Vinyl Plate
ECOS	6.3mm Length Terminal (Standard)		A 20mm		25 ~ 50mm lengths
ECEC	4.0mm Length "Short" Terminal (See page 7)		B 22mm		A With Plate
			C 25mm		B Without plate
			D 30mm		20mm length
			E 35mm		L With Plate
			F 40mm		G Without plate
					Extended Capacitance Ratings
					X With plate

Ripple Current
Multipliers:
Page 7

TS-UP Standard Ratings

Cap. (µF)	Size (mm) D x L	Max 85°C R.C. (A _{rms})		Max. 20°C ESR (Ω)		Panasonic Part Number	Cap. (µF)	Size (mm) D x L	Max 85°C R.C. (A _{rms})		Max. 20°C ESR (Ω)		Panasonic Part Number
		120Hz	10k-100kHz	120Hz	20kHz				120Hz	10k-100kHz	120Hz	20kHz	
16 VDC Working, 20 VDC Surge							25 VDC Working, 32 VDC Surge						
6800	20 x 25	3.15	3.62	0.098	0.083	ECOS1CP682AA	4700	20 x 25	3.05	3.51	0.113	0.090	ECOS1EP472AA
8200	20 x 30	3.47	3.99	0.081	0.069	ECOS1CP822AA	5600	20 x 30	3.36	3.86	0.095	0.076	ECOS1EP562AA
10000	20 x 35	3.78	4.35	0.066	0.056	ECOS1CP103AA	6800	20 x 35	3.47	3.99	0.078	0.062	ECOS1EP682AA
12000	20 x 35	4.52	5.20	0.062	0.053	ECOS1CP123AA	8200	20 x 40	3.57	4.11	0.065	0.052	ECOS1EP822AA
15000	20 x 40	5.26	6.05	0.053	0.045	ECOS1CP153AA	3300	22 x 20	1.60	1.84	0.176	0.141	ECOS1EP332BL
4700	22 x 20	1.60	1.84	0.159	0.135	ECOS1CP472BL	3300	22 x 25	1.68	1.93	0.161	0.129	ECOS1EP332BA
4700	22 x 25	1.77	2.04	0.159	0.135	ECOS1CP472BA	4700	22 x 25	2.39	2.75	0.113	0.090	ECOS1EP472BA
6800	22 x 25	2.57	2.96	0.110	0.093	ECOS1CP682BA	5600	22 x 25	2.86	3.29	0.095	0.076	ECOS1EP562BA
8200	22 x 25	3.10	3.57	0.091	0.077	ECOS1CP822BA	6800	22 x 30	3.47	3.99	0.078	0.062	ECOS1EP682BA
10000	22 x 30	3.78	4.35	0.075	0.063	ECOS1CP103BA	8200	22 x 30	3.57	4.11	0.065	0.052	ECOS1EP822BA
12000	22 x 30	4.52	5.20	0.062	0.053	ECOS1CP123BA	10000	22 x 35	3.78	4.35	0.058	0.046	ECOS1EP103BA
15000	22 x 35	5.26	6.05	0.053	0.045	ECOS1CP153BA	12000	22 x 40	4.10	4.72	0.048	0.039	ECOS1EP123BA
18000	22 x 40	5.57	6.41	0.046	0.039	ECOS1CP183BA	15000	22 x 50	4.63	5.32	0.039	0.031	ECOS1EP153BA
22000	22 x 45	6.10	7.02	0.038	0.032	ECOS1CP223BA	4700	25 x 20	1.80	2.07	0.123	0.099	ECOS1EP472CL
6800	25 x 20	1.80	2.07	0.110	0.093	ECOS1CP682CL	6800	25 x 25	3.47	3.99	0.078	0.062	ECOS1EP682CA
10000	25 x 25	3.78	4.35	0.075	0.063	ECOS1CP103CA	8200	25 x 25	3.57	4.11	0.065	0.052	ECOS1EP822CA
12000	25 x 25	4.52	5.20	0.062	0.053	ECOS1CP123CA	10000	25 x 30	3.78	4.35	0.058	0.046	ECOS1EP103CA
15000	25 x 30	5.26	6.05	0.053	0.045	ECOS1CP153CA	12000	25 x 35	4.10	4.72	0.048	0.039	ECOS1EP123CA
18000	25 x 30	5.57	6.41	0.046	0.039	ECOS1CP183CA	15000	25 x 40	4.63	5.32	0.039	0.031	ECOS1EP153CA
22000	25 x 35	6.10	7.02	0.038	0.032	ECOS1CP223CA	18000	25 x 45	5.47	6.29	0.035	0.028	ECOS1EP183CA
27000	25 x 45	6.31	7.26	0.031	0.026	ECOS1CP273CA	22000	25 x 50	6.10	7.02	0.029	0.023	ECOS1EP223CA
33000	25 x 50	6.84	7.87	0.025	0.021	ECOS1CP333CA	6800	30 x 20	2.30	2.65	0.078	0.062	ECOS1EP682DL
10000	30 x 20	2.40	2.76	0.083	0.070	ECOS1CP103DL	10000	30 x 25	3.78	4.35	0.058	0.046	ECOS1EP103DA
22000	30 x 30	6.10	7.02	0.038	0.032	ECOS1CP223DA	12000	30 x 30	4.10	4.72	0.048	0.039	ECOS1EP123DA
27000	30 x 35	6.31	7.26	0.031	0.026	ECOS1CP273DA	15000	30 x 30	4.63	5.32	0.039	0.031	ECOS1EP153DA
33000	30 x 40	6.84	7.87	0.025	0.021	ECOS1CP333DA	18000	30 x 35	5.47	6.29	0.035	0.028	ECOS1EP183DA
39000	30 x 45	6.94	7.98	0.021	0.018	ECOS1CP393DA	22000	30 x 40	6.10	7.02	0.029	0.023	ECOS1EP223DA
47000	30 x 50	7.47	8.59	0.019	0.017	ECOS1CP473DA	27000	30 x 45	6.21	7.14	0.023	0.019	ECOS1EP273DA
15000	35 x 20	3.20	3.68	0.055	0.047	ECOS1CP153EL	33000	30 x 50	6.84	7.87	0.020	0.017	ECOS1EP333DA
33000	35 x 30	6.84	7.87	0.025	0.021	ECOS1CP333EA	10000	35 x 20	2.70	3.11	0.061	0.049	ECOS1EP103EL
39000	35 x 35	6.94	7.98	0.021	0.018	ECOS1CP393EA	27000	35 x 35	6.21	7.14	0.025	0.020	ECOS1EP273EA
47000	35 x 40	7.47	8.59	0.021	0.019	ECOS1CP473EA	33000	35 x 40	6.84	7.87	0.020	0.017	ECOS1EP333EA
56000	35 x 45	8.73	10.04	0.019	0.018	ECOS1CP563EA	39000	35 x 45	7.36	8.46	0.019	0.017	ECOS1EP393EA
68000	35 x 50	9.05	10.41	0.018	0.017	ECOS1CP683EA	47000	35 x 50	8.00	9.20	0.017	0.015	ECOS1EP473EA
68000	40 x 40	9.05	10.41	0.018	0.017	ECOS1CP683FA	47000	40 x 40	8.00	9.20	0.017	0.015	ECOS1EP473FA
82000	40 x 50	10.29	11.83	0.016	0.015	ECOS1CP823FA	56000	40 x 50	8.96	10.30	0.016	0.015	ECOS1EP563FA

TS-UP Standard Ratings (continued)

Cap. (μF)	Size (mm) D x L	Max. 85°C R.C. (A _{rms})		Max. 20°C ESR (Ω)		Panasonic Part Number	Cap. (μF)	Size (mm) D x L	Max. 85°C R.C. (A _{rms})		Max. 20°C ESR (Ω)		Panasonic Part Number
		120Hz	10k~100kHz	120Hz	20kHz				120Hz	10k~100kHz	120Hz	20kHz	
400 VDC Working, 450 VDC Surge							450 VDC Working, 500 VDC Surge						
82	20 x 30	0.83	1.16	2.022	0.708	ECOS2GP820AA	56	20 x 30	0.70	0.98	2.960	1.184	ECOS2WP560AA
100	20 x 35	0.92	1.29	1.658	0.580	ECOS2GP101AA	82	20 x 35	0.83	1.16	2.022	0.809	ECOS2WP820AA
120	20 x 40	1.02	1.43	1.382	0.484	ECOS2GP121AA	33	22 x 20	0.20	0.28	6.028	2.411	ECOS2WP330BL
47	22 x 20	0.25	0.35	3.527	1.235	ECOS2GP470BL	33	22 x 25	0.41	0.57	6.028	2.411	ECOS2WP330BA
47	22 x 25	0.47	0.66	3.527	1.235	ECOS2GP470BA	47	22 x 25	0.59	0.83	4.233	1.693	ECOS2WP470BA
68	22 x 25	0.69	0.97	2.438	0.853	ECOS2GP680BA	56	22 x 25	0.70	0.98	2.960	1.184	ECOS2WP560BA
82	22 x 25	0.83	1.16	2.022	0.708	ECOS2GP820BA	82	22 x 30	0.83	1.16	2.022	0.809	ECOS2WP820BA
100	22 x 30	0.92	1.29	1.658	0.580	ECOS2GP101BA	100	22 x 35	0.93	1.30	1.658	0.663	ECOS2WP101BA
120	22 x 35	1.02	1.43	1.382	0.484	ECOS2GP121BA	120	22 x 40	1.04	1.46	1.382	0.553	ECOS2WP121BA
150	22 x 40	1.16	1.62	1.105	0.387	ECOS2GP151BA	150	22 x 50	1.19	1.67	1.105	0.442	ECOS2WP151BA
180	22 x 45	1.44	2.02	0.921	0.322	ECOS2GP181BA	47	25 x 20	0.29	0.41	4.233	1.693	ECOS2WP470CL
220	22 x 50	1.49	2.09	0.754	0.264	ECOS2GP221BA	82	25 x 25	0.83	1.16	2.022	0.809	ECOS2WP820CA
68	25 x 20	0.35	0.49	2.926	1.024	ECOS2GP680CL	120	25 x 30	1.04	1.46	1.382	0.553	ECOS2WP121CA
100	25 x 25	0.92	1.29	1.658	0.580	ECOS2GP101CA	150	25 x 40	1.19	1.67	1.105	0.442	ECOS2WP151CA
120	25 x 25	1.02	1.43	1.382	0.484	ECOS2GP121CX	180	25 x 40	1.35	1.89	0.921	0.368	ECOS2WP181CX
150	25 x 30	1.16	1.62	1.105	0.387	ECOS2GP151CA	180	25 x 45	1.35	1.89	0.921	0.368	ECOS2WP181CA
180	25 x 30	1.44	2.02	0.921	0.322	ECOS2GP181CX	220	25 x 45	1.55	2.17	0.754	0.301	ECOS2WP221CX
180	25 x 35	1.44	2.02	0.921	0.322	ECOS2GP181CA	220	25 x 50	1.55	2.17	0.754	0.301	ECOS2WP221CA
220	25 x 40	1.49	2.09	0.754	0.264	ECOS2GP221CA	68	30 x 20	0.38	0.53	2.926	1.170	ECOS2WP680DL
270	25 x 45	1.67	2.34	0.675	0.236	ECOS2GP271CA	120	30 x 25	1.04	1.46	1.382	0.553	ECOS2WP121DA
100	30 x 20	0.47	0.66	1.989	0.696	ECOS2GP101DL	150	30 x 30	1.19	1.67	1.105	0.442	ECOS2WP151DA
150	30 x 25	1.16	1.62	1.105	0.387	ECOS2GP151DA	180	30 x 30	1.35	1.89	0.921	0.368	ECOS2WP181DX
220	30 x 30	1.49	2.09	0.754	0.264	ECOS2GP221DA	180	30 x 35	1.35	1.89	0.921	0.368	ECOS2WP181DA
270	30 x 35	1.67	2.34	0.675	0.236	ECOS2GP271DA	220	30 x 35	1.55	2.17	0.754	0.301	ECOS2WP221DX
330	30 x 40	1.90	2.66	0.553	0.193	ECOS2GP331DA	220	30 x 40	1.55	2.17	0.754	0.301	ECOS2WP221DA
390	30 x 45	2.13	2.98	0.468	0.164	ECOS2GP391DA	270	30 x 45	1.78	2.49	0.675	0.270	ECOS2WP271DA
150	35 x 20	0.60	0.84	1.326	0.464	ECOS2GP151EL	330	30 x 50	2.01	2.81	0.553	0.249	ECOS2WP331DA
270	35 x 30	1.67	2.34	0.675	0.236	ECOS2GP271EA	100	35 x 20	0.52	0.73	1.989	0.796	ECOS2WP101EL
330	35 x 30	1.90	2.66	0.553	0.193	ECOS2GP331EX	180	35 x 25	1.35	1.89	0.921	0.368	ECOS2WP181EA
330	35 x 35	1.90	2.66	0.553	0.193	ECOS2GP331EA	220	35 x 30	1.55	2.17	0.754	0.301	ECOS2WP221EA
390	35 x 35	2.13	2.98	0.468	0.164	ECOS2GP391EX	270	35 x 30	1.78	2.49	0.614	0.246	ECOS2WP271EX
390	35 x 40	2.13	2.98	0.468	0.164	ECOS2GP391EA	270	35 x 35	1.78	2.49	0.675	0.270	ECOS2WP271EA
470	35 x 40	2.39	3.35	0.388	0.136	ECOS2GP471EX	330	35 x 35	2.01	2.81	0.553	0.221	ECOS2WP331EX
470	35 x 45	2.39	3.35	0.388	0.136	ECOS2GP471EA	330	35 x 40	2.01	2.81	0.553	0.249	ECOS2WP331EA
560	35 x 45	2.69	3.77	0.326	0.114	ECOS2GP561EX	390	35 x 45	2.24	3.14	0.510	0.255	ECOS2WP391EA
560	35 x 50	2.69	3.77	0.326	0.114	ECOS2GP561EA	470	35 x 45	2.53	3.54	0.423	0.233	ECOS2WP471EX
680	35 x 50	3.00	4.20	0.268	0.094	ECOS2GP681EX	470	35 x 50	2.53	3.54	0.423	0.233	ECOS2WP471EA
560	40 x 40	2.69	3.77	0.326	0.114	ECOS2GP561FA	470	40 x 40	2.53	3.54	0.423	0.233	ECOS2WP471FA
820	40 x 50	3.38	4.73	0.222	0.078	ECOS2GP821FA	680	40 x 50	3.15	4.41	0.293	0.161	ECOS2WP681FA
500 VDC Working, 550 VDC Surge													
47	22 x 25	0.63	0.88	3.527	1.411	ECOS2HP470BA							
56	22 x 30	0.70	0.98	2.960	1.184	ECOS2HP560BA							
68	22 x 35	0.78	1.09	2.438	0.975	ECOS2HP680BA							
82	22 x 40	0.88	1.23	2.022	0.809	ECOS2HP820BA							
100	22 x 45	0.99	1.39	1.658	0.663	ECOS2HP101BA							
120	22 x 50	1.13	1.58	1.382	0.553	ECOS2HP121BA							
68	25 x 25	0.78	1.09	2.438	0.975	ECOS2HP680CA							
82	25 x 30	0.88	1.23	2.022	0.809	ECOS2HP820CA							
100	25 x 35	0.99	1.39	1.658	0.663	ECOS2HP101CA							
120	25 x 40	1.13	1.58	1.382	0.553	ECOS2HP121CA							
150	25 x 45	1.29	1.80	1.105	0.442	ECOS2HP151CA							
180	25 x 50	1.38	1.93	0.921	0.368	ECOS2HP181CA							
120	30 x 30	1.13	1.58	1.382	0.553	ECOS2HP121DA							
150	30 x 35	1.29	1.80	1.105	0.442	ECOS2HP151DA							
180	30 x 40	1.38	1.93	0.921	0.368	ECOS2HP181DA							
220	30 x 45	1.50	2.10	0.754	0.339	ECOS2HP221DA							
150	35 x 25	1.20	1.68	1.105	0.442	ECOS2HP151EA							
180	35 x 30	1.36	1.90	0.921	0.368	ECOS2HP181EA							
220	35 x 35	1.54	2.16	0.754	0.301	ECOS2HP221EA							
270	35 x 40	1.76	2.46	0.614	0.276	ECOS2HP271EA							
330	35 x 45	1.99	2.79	0.502	0.251	ECOS2HP331EA							
390	35 x 50	2.22	3.11	0.425	0.234	ECOS2HP391EA							
330	40 x 40	2.16	3.02	0.502	0.276	ECOS2HP331FA							
470	40 x 50	2.70	3.78	0.353	0.194	ECOS2HP471FA							