

Series: **TS-UP**■ **Features**

- Compact size for general purpose applications
- 20~40% smaller in size when compared to TS-U series
- Wide range of case sizes including 20mm lengths for low profile applications
- Top vent construction

■ **Specifications**

Rated working voltage	16~250 VDC							350~450 VDC			
Operating temperature	-40 ~ +85°C							-25 ~ +85°C			
Nominal capacitance	120 ~ 68000 µF							33 ~ 680 µF			
Dissipation factor (120 Hz, +20°C)	Working voltage (V):		16	25	35	50	63	80	100	160~400	450
	Max. D.F. (%):		50	40	35	30	25	20	20	15	20

For capacitance values > 33000µF, add the value of: $\frac{\text{(rated cap. } [\mu\text{F}] - 33000 \mu\text{F}}{10000 \mu\text{F}} \times 0.1$

Endurance 2000 hours at +85°C with maximum specified ripple current

■ **Part Number System**

E	C				P						
Common Code/ Terminal Type		Voltage Code		Series		Capacitance Code		Case Diameter		Top Vinyl Plate	
ECOS Standard 6mm terminal								A 20mm D 30mm		25~50mm lengths 20mm length	
ECEC "Short" 4mm terminal								B 22mm E 35mm		A With plate L With plate	
								C 25mm		B Without plate G Without plate	

■ **TS-UP Standard Ratings** (NOTE: Shaded listings indicate low profile products)

Cap. (µF)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.		Cap. (µF)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.	
		120Hz	10k~50kHz	120Hz	20kHz					120Hz	10k~50kHz	120Hz	20kHz		
16 VDC Working, 20 VDC Surge								25 VDC Working, 32 VDC Surge							
4700	22 x 20	1.60	1.84	0.159	0.135	ECOS1CP472B	□	3300	22 x 20	1.60	1.84	0.176	0.141	ECOS1EP332B	□
6800	20 x 25	3.15	3.62	0.098	0.083	ECOS1CP682A	□	4700	20 x 25	3.05	3.51	0.113	0.090	ECOS1EP472A	□
6800	25 x 20	1.80	2.07	0.110	0.093	ECOS1CP682C	□	4700	25 x 20	1.80	2.07	0.123	0.099	ECOS1EP472C	□
8200	20 x 30	3.47	3.99	0.081	0.069	ECOS1CP822A	□	5600	20 x 30	3.36	3.86	0.095	0.076	ECOS1EP562A	□
10000	20 x 35	3.78	4.35	0.066	0.056	ECOS1CP103A	□	6800	20 x 35	3.47	3.99	0.078	0.062	ECOS1EP682A	□
10000	22 x 30	3.78	4.35	0.075	0.063	ECOS1CP103B	□	6800	22 x 30	3.47	3.99	0.078	0.062	ECOS1EP682B	□
10000	25 x 25	3.78	4.35	0.075	0.063	ECOS1CP103C	□	6800	25 x 25	3.47	3.99	0.078	0.062	ECOS1EP682C	□
10000	30 x 20	2.40	2.76	0.083	0.070	ECOS1CP103D	□	6800	30 x 20	2.30	2.65	0.078	0.062	ECOS1EP682D	□
12000	20 x 35	4.52	5.20	0.062	0.053	ECOS1CP123A	□	8200	20 x 40	3.57	4.11	0.065	0.052	ECOS1EP822A	□
12000	22 x 30	4.52	5.20	0.062	0.053	ECOS1CP123B	□	8200	22 x 30	3.57	4.11	0.065	0.052	ECOS1EP822B	□
12000	25 x 25	4.52	5.20	0.062	0.053	ECOS1CP123C	□	8200	25 x 25	3.57	4.11	0.065	0.052	ECOS1EP822C	□
15000	20 x 40	5.26	6.05	0.053	0.045	ECOS1CP153A	□	10000	22 x 35	3.78	4.35	0.058	0.046	ECOS1EP103B	□
15000	22 x 35	5.26	6.05	0.053	0.045	ECOS1CP153B	□	10000	25 x 30	3.78	4.35	0.058	0.046	ECOS1EP103C	□
15000	25 x 30	5.26	6.05	0.053	0.045	ECOS1CP153C	□	10000	30 x 25	3.78	4.35	0.058	0.046	ECOS1EP103D	□
15000	35 x 20	3.20	3.68	0.055	0.047	ECOS1CP153E	□	10000	35 x 20	2.70	3.11	0.061	0.049	ECOS1EP103E	□
18000	22 x 40	5.57	6.41	0.046	0.039	ECOS1CP183B	□	12000	22 x 40	4.10	4.72	0.048	0.039	ECOS1EP123B	□
18000	25 x 30	5.57	6.41	0.046	0.039	ECOS1CP183C	□	12000	25 x 35	4.10	4.72	0.048	0.039	ECOS1EP123C	□
22000	22 x 45	6.10	7.02	0.038	0.032	ECOS1CP223B	□	12000	30 x 30	4.10	4.72	0.048	0.039	ECOS1EP123D	□
22000	25 x 35	6.10	7.02	0.038	0.032	ECOS1CP223C	□	15000	22 x 50	4.63	5.32	0.039	0.031	ECOS1EP153B	□
22000	30 x 30	6.10	7.02	0.038	0.032	ECOS1CP223D	□	15000	25 x 40	4.63	5.32	0.039	0.031	ECOS1EP153C	□
27000	25 x 45	6.31	7.26	0.031	0.026	ECOS1CP273C	□	15000	30 x 30	4.63	5.32	0.039	0.031	ECOS1EP153D	□
27000	30 x 35	6.31	7.26	0.031	0.026	ECOS1CP273D	□	18000	25 x 45	5.47	6.29	0.035	0.028	ECOS1EP183C	□
33000	25 x 50	6.84	7.87	0.025	0.021	ECOS1CP333C	□	18000	30 x 35	5.47	6.29	0.035	0.028	ECOS1EP183D	□
33000	30 x 40	6.84	7.87	0.025	0.021	ECOS1CP333D	□	22000	25 x 50	6.10	7.02	0.029	0.023	ECOS1EP223C	□
33000	35 x 30	6.84	7.87	0.025	0.021	ECOS1CP333E	□	22000	30 x 40	6.10	7.02	0.029	0.023	ECOS1EP223D	□
39000	30 x 45	6.94	7.98	0.021	0.018	ECOS1CP393D	□	27000	30 x 45	6.21	7.14	0.023	0.019	ECOS1EP273D	□
39000	35 x 35	6.94	7.98	0.021	0.018	ECOS1CP393E	□	27000	35 x 35	6.21	7.14	0.025	0.020	ECOS1EP273E	□
47000	30 x 50	7.47	8.59	0.019	0.017	ECOS1CP473D	□	33000	30 x 50	6.84	7.87	0.020	0.017	ECOS1EP333D	□
47000	35 x 40	7.47	8.59	0.021	0.019	ECOS1CP473E	□	33000	35 x 40	6.84	7.87	0.020	0.017	ECOS1EP333E	□
56000	35 x 45	8.73	10.04	0.019	0.018	ECOS1CP563E	□	39000	35 x 45	7.36	8.46	0.019	0.017	ECOS1EP393E	□
68000	35 x 50	9.05	10.41	0.018	0.017	ECOS1CP683E	□	47000	35 x 50	8.00	9.20	0.017	0.015	ECOS1EP473E	□

■ TS-UP Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.	Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.
		120Hz	10k–50kHz	120Hz	20kHz				120Hz	10k–50kHz	120Hz	20kHz	
35 VDC Working, 44 VDC Surge							50 VDC Working, 63 VDC Surge						
2200	22 x 20	1.40	1.61	0.181	0.136	ECOS1VP222B □	1500	22 x 20	1.20	1.38	0.254	0.191	ECOS1HP152B □
3300	20 x 25	2.73	3.14	0.111	0.083	ECOS1VP332A □	2200	20 x 25	2.26	2.60	0.151	0.113	ECOS1HP222A □
3300	25 x 20	1.70	1.96	0.121	0.090	ECOS1VP332C □	2200	25 x 20	1.40	1.61	0.173	0.130	ECOS1HP222C □
3900	20 x 30	2.94	3.38	0.094	0.070	ECOS1VP392A □	2700	20 x 30	2.52	2.90	0.123	0.092	ECOS1HP272A □
4700	20 x 35	3.26	3.75	0.078	0.058	ECOS1VP472A □	3300	20 x 35	2.73	3.14	0.100	0.075	ECOS1HP332A □
4700	22 x 30	3.26	3.75	0.078	0.058	ECOS1VP472B □	3300	22 x 30	2.73	3.14	0.100	0.075	ECOS1HP332B □
4700	25 x 25	3.26	3.75	0.078	0.058	ECOS1VP472C □	3300	25 x 25	2.73	3.14	0.100	0.075	ECOS1HP332C □
4700	30 x 20	2.00	2.30	0.088	0.066	ECOS1VP472D □	3300	30 x 20	1.70	1.96	0.116	0.087	ECOS1HP332D □
5600	20 x 40	3.36	3.86	0.080	0.060	ECOS1VP562A □	3900	20 x 40	2.75	3.16	0.085	0.064	ECOS1HP392A □
5600	22 x 30	3.36	3.86	0.080	0.060	ECOS1VP562B □	3900	22 x 30	2.75	3.16	0.085	0.064	ECOS1HP392B □
5600	25 x 25	3.36	3.86	0.080	0.060	ECOS1VP562C □	3900	25 x 25	2.75	3.16	0.085	0.064	ECOS1HP392C □
6800	22 x 35	3.68	4.23	0.066	0.049	ECOS1VP682B □	4700	22 x 35	3.03	3.48	0.071	0.053	ECOS1HP472B □
6800	25 x 30	3.68	4.23	0.066	0.049	ECOS1VP682C □	4700	25 x 30	3.03	3.48	0.071	0.053	ECOS1HP472C □
6800	35 x 20	2.40	2.76	0.071	0.053	ECOS1VP682E □	4700	30 x 25	3.03	3.48	0.071	0.053	ECOS1HP472D □
8200	22 x 40	4.00	4.60	0.057	0.042	ECOS1VP822B □	4700	35 x 20	2.10	2.42	0.081	0.061	ECOS1HP472E □
8200	25 x 35	4.00	4.60	0.057	0.042	ECOS1VP822C □	5600	22 x 40	3.42	3.93	0.059	0.044	ECOS1HP562B □
10000	22 x 45	4.42	5.08	0.050	0.037	ECOS1VP103B □	5600	25 x 35	3.42	3.93	0.059	0.044	ECOS1HP562C □
10000	25 x 40	4.42	5.08	0.050	0.037	ECOS1VP103C □	5600	30 x 30	3.42	3.93	0.059	0.044	ECOS1HP562D □
10000	30 x 30	4.42	5.08	0.050	0.037	ECOS1VP103D □	6800	22 x 50	3.85	4.43	0.049	0.037	ECOS1HP682B □
10000	35 x 25	4.42	5.08	0.050	0.037	ECOS1VP103E □	6800	25 x 40	3.85	4.43	0.049	0.037	ECOS1HP682C □
12000	25 x 45	5.05	5.81	0.044	0.033	ECOS1VP123C □	6800	30 x 30	3.85	4.43	0.049	0.037	ECOS1HP682D □
12000	30 x 35	5.05	5.81	0.044	0.033	ECOS1VP123D □	8200	25 x 45	4.41	5.07	0.040	0.030	ECOS1HP822C □
12000	35 x 30	5.05	5.81	0.044	0.033	ECOS1VP123E □	8200	30 x 35	4.41	5.07	0.040	0.030	ECOS1HP822D □
15000	25 x 50	5.57	6.41	0.036	0.027	ECOS1VP153C □	10000	25 x 50	4.97	5.72	0.036	0.027	ECOS1HP103C □
15000	30 x 40	5.57	6.41	0.036	0.027	ECOS1VP153D □	10000	30 x 40	4.97	5.72	0.036	0.027	ECOS1HP103D □
15000	35 x 30	5.57	6.41	0.036	0.027	ECOS1VP153E □	10000	35 x 30	4.97	5.72	0.036	0.027	ECOS1HP103E □
18000	30 x 45	5.68	6.53	0.030	0.023	ECOS1VP183D □	12000	30 x 45	5.58	6.42	0.032	0.024	ECOS1HP123D □
18000	35 x 35	5.68	6.53	0.030	0.023	ECOS1VP183E □	12000	35 x 35	5.58	6.42	0.032	0.024	ECOS1HP123E □
22000	30 x 50	6.10	7.02	0.026	0.020	ECOS1VP223D □	15000	30 x 50	6.44	7.41	0.028	0.021	ECOS1HP153D □
22000	35 x 40	6.10	7.02	0.026	0.020	ECOS1VP223E □	15000	35 x 40	6.44	7.41	0.028	0.021	ECOS1HP153E □
27000	35 x 45	6.84	7.87	0.021	0.017	ECOS1VP273E □	18000	35 x 45	6.94	7.98	0.023	0.018	ECOS1HP183E □
33000	35 x 50	7.15	8.22	0.018	0.014	ECOS1VP333E □	22000	35 x 50	7.57	8.71	0.021	0.017	ECPS1HP223E □

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR ($\pm$ max.)		Panasonic Part No.		Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR ($\pm$ max.)		Panasonic Part No.	
		120Hz	10k–50kHz	120Hz	20kHz					120Hz	10k–50kHz	120Hz	20kHz		
63 VDC Working, 79 VDC Surge							80 VDC Working, 100 VDC Surge								
1000	22 x 20	1.20	1.38	0.381	0.286	ECOS1JP103B	☐	680	22 x 20	1.00	1.15	0.439	0.329	ECOS1KP681B	☐
1500	25 x 20	1.30	1.50	0.254	0.191	ECOS1JP152C	☐	1000	25 x 20	1.20	1.38	0.298	0.244	ECOS1KP102B	☐
2200	20 x 35	2.52	2.90	0.151	0.113	ECOS1JP222A	☐	1500	20 x 35	2.26	2.60	0.177	0.133	ECOS1KP152A	☐
2200	22 x 30	2.52	2.90	0.151	0.113	ECOS1JP222B	☐	1500	22 x 30	2.26	2.60	0.177	0.133	ECOS1KP152B	☐
2200	25 x 25	2.52	2.90	0.151	0.113	ECOS1JP222C	☐	1500	25 x 25	2.26	2.60	0.177	0.133	ECOS1KP152C	☐
2200	30 x 20	1.50	1.73	0.173	0.130	ECOS1JP222D	☐	1500	30 x 20	1.40	1.61	0.199	0.149	ECOS1KP152D	☐
2700	20 x 40	3.73	4.29	0.123	0.092	ECOS1JP272A	☐	1800	20 x 40	2.52	2.90	0.147	0.111	ECOS1KP182A	☐
2700	22 x 35	3.73	4.29	0.123	0.092	ECOS1JP272B	☐	1800	22 x 35	2.52	2.90	0.147	0.111	ECOS1KP182B	☐
2700	25 x 30	3.73	4.29	0.123	0.092	ECOS1JP272C	☐	1800	25 x 30	2.52	2.90	0.147	0.111	ECOS1KP182C	☐
3300	22 x 40	4.10	4.72	0.105	0.079	ECOS1JP332B	☐	2200	22 x 40	2.73	3.14	0.121	0.090	ECOS1KP222B	☐
3300	25 x 30	4.10	4.72	0.105	0.079	ECOS1JP332C	☐	2200	25 x 30	2.73	3.14	0.121	0.090	ECOS1KP222C	☐
3300	30 x 25	4.10	4.72	0.105	0.079	ECOS1JP332D	☐	2200	30 x 25	2.73	3.14	0.121	0.090	ECOS1KP222D	☐
3300	35 x 20	1.70	1.96	0.126	0.094	ECOS1JP332E	☐	2200	35 x 20	1.70	1.96	0.136	0.102	ECOS1KP222E	☐
3900	22 x 45	4.44	5.11	0.098	0.073	ECOS1JP392B	☐	2700	22 x 45	2.78	3.20	0.098	0.074	ECOS1KP272B	☐
3900	25 x 35	4.44	5.11	0.098	0.073	ECOS1JP392C	☐	2700	25 x 35	2.78	3.20	0.098	0.074	ECOS1KP272C	☐
3900	30 x 30	4.44	5.11	0.098	0.073	ECOS1JP392D	☐	2700	30 x 30	2.78	3.20	0.098	0.074	ECOS1KP272D	☐
4700	22 x 50	4.86	5.59	0.081	0.061	ECOS1JP472B	☐	3300	22 x 50	3.21	3.69	0.085	0.064	ECOS1KP332B	☐
4700	25 x 40	4.86	5.59	0.081	0.061	ECOS1JP472C	☐	3300	25 x 40	3.21	3.69	0.085	0.064	ECOS1KP332C	☐
4700	30 x 30	4.86	5.59	0.081	0.061	ECOS1JP472D	☐	3300	30 x 30	3.21	3.69	0.085	0.064	ECOS1KP332D	☐
4700	35 x 25	4.86	5.59	0.081	0.061	ECOS1JP472E	☐	3900	25 x 45	3.59	4.13	0.077	0.057	ECOS1KP392C	☐
5600	25 x 45	5.36	6.16	0.068	0.051	ECOS1JP562C	☐	3900	30 x 35	3.59	4.13	0.077	0.057	ECOS1KP392D	☐
5600	30 x 35	5.36	6.16	0.068	0.051	ECOS1JP562D	☐	4700	25 x 50	4.09	4.70	0.063	0.048	ECOS1KP472C	☐
5600	35 x 30	5.36	6.16	0.068	0.051	ECOS1JP562E	☐	4700	30 x 40	4.09	4.70	0.063	0.048	ECOS1KP472D	☐
6800	25 x 50	5.84	6.72	0.061	0.046	ECOS1JP682C	☐	5600	30 x 45	4.55	5.23	0.056	0.042	ECOS1KP562D	☐
6800	30 x 40	5.84	6.72	0.061	0.046	ECOS1JP682D	☐	5600	35 x 35	4.55	5.23	0.056	0.042	ECOS1KP562E	☐
6800	35 x 30	5.84	6.72	0.061	0.046	ECOS1JP682E	☐	6800	30 x 50	5.16	5.93	0.046	0.035	ECOS1KP682D	☐
8200	30 x 45	6.00	6.90	0.051	0.038	ECOS1JP822D	☐	6800	35 x 40	5.16	5.93	0.046	0.035	ECOS1KP682E	☐
8200	35 x 35	6.00	6.90	0.051	0.038	ECOS1JP822E	☐	8200	35 x 50	5.83	6.70	0.038	0.029	ECOS1KP822E	☐
10000	35 x 40	6.52	7.50	0.041	0.033	ECOS1JP103E	☐								
12000	35 x 50	7.15	8.22	0.035	0.028	ECOS1JP123E	☐								

■ TS-UP Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.	Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.
		120Hz	10k–50kHz	120Hz	20kHz				120Hz	10k–50kHz	120Hz	20kHz	
100 VDC Working, 125 VDC Surge							160 VDC Working, 200 VDC Surge						
470	22 x 20	1.00	1.15	0.529	0.344	ECOS2AP471B □	220	22 x 20	0.75	1.05	0.980	0.490	ECOS2CP221B □
680	25 x 20	1.10	1.27	0.366	0.238	ECOS2AP681B □	270	25 x 20	0.87	1.22	0.798	0.399	ECOS2CP271B □
1000	20 x 35	1.96	2.25	0.216	0.140	ECOS2AP102A □	330	20 x 30	1.45	2.03	0.553	0.276	ECOS2CP331A □
1000	22 x 30	1.96	2.25	0.216	0.140	ECOS2AP102B □	330	22 x 25	1.45	2.03	0.553	0.276	ECOS2CP331B □
1000	25 x 25	1.96	2.25	0.216	0.140	ECOS2AP102C □	390	20 x 35	1.62	2.27	0.468	0.234	ECOS2CP391A □
1000	30 x 20	1.20	1.38	0.249	0.162	ECOS2AP102D □	390	22 x 30	1.62	2.27	0.468	0.234	ECOS2CP391B □
1200	20 x 40	2.31	2.66	0.180	0.117	ECOS2AP122A □	390	25 x 25	1.62	2.27	0.468	0.234	ECOS2CP391C □
1200	22 x 35	2.31	2.66	0.180	0.117	ECOS2AP122B □	390	30 x 20	1.10	1.54	0.595	0.298	ECOS2CP391D □
1200	25 x 30	2.31	2.66	0.180	0.117	ECOS2AP122C □	470	22 x 30	2.11	2.95	0.423	0.212	ECOS2CP471B □
1500	22 x 40	2.57	2.96	0.144	0.093	ECOS2AP152B □	470	25 x 25	2.11	2.95	0.423	0.212	ECOS2CP471C □
1500	25 x 30	2.57	2.96	0.155	0.101	ECOS2AP152C □	560	22 x 35	2.25	3.15	0.355	0.178	ECOS2CP561B □
1500	30 x 25	2.57	2.96	0.155	0.101	ECOS2AP152D □	560	25 x 30	2.25	3.15	0.355	0.178	ECOS2CP561C □
1500	35 x 20	1.50	1.73	0.177	0.115	ECOS2AP152E □	560	30 x 25	2.25	3.15	0.355	0.178	ECOS2CP561D □
1800	22 x 45	2.84	3.27	0.129	0.084	ECOS2AP182B □	560	35 x 20	1.30	1.82	0.414	0.207	ECOS2CP561E □
1800	25 x 35	2.84	3.27	0.138	0.090	ECOS2AP182C □	680	22 x 40	2.50	3.50	0.293	0.146	ECOS2CP681B □
1800	30 x 30	2.84	3.27	0.138	0.090	ECOS2AP182D □	680	25 x 35	2.50	3.50	0.293	0.146	ECOS2CP681C □
2200	22 x 50	3.14	3.61	0.121	0.078	ECOS2AP222B □	680	30 x 25	2.50	3.50	0.293	0.146	ECOS2CP681D □
2200	25 x 40	3.14	3.61	0.121	0.078	ECOS2AP222C □	820	22 x 45	2.75	3.85	0.263	0.131	ECOS2CP821B □
2200	30 x 30	3.14	3.61	0.121	0.078	ECOS2AP222D □	820	25 x 35	2.75	3.85	0.263	0.131	ECOS2CP821C □
2700	25 x 45	3.71	4.27	0.104	0.068	ECOS2AP272C □	820	30 x 30	2.75	3.85	0.263	0.131	ECOS2CP821D □
2700	30 x 35	3.71	4.27	0.104	0.068	ECOS2AP272D □	1000	25 x 45	3.00	4.20	0.232	0.128	ECOS2CP102C □
3300	25 x 50	4.06	4.67	0.090	0.059	ECOS2AP332C □	1000	30 x 35	3.00	4.20	0.232	0.128	ECOS2CP102D □
3300	30 x 40	4.06	4.67	0.090	0.059	ECOS2AP332D □	1000	35 x 30	3.00	4.20	0.232	0.128	ECOS2CP102E □
3900	30 x 45	4.54	5.22	0.077	0.050	ECOS2AP392D □	1200	25 x 50	3.25	4.55	0.207	0.114	ECOS2CP122C □
3900	35 x 35	4.54	5.22	0.081	0.052	ECOS2AP392E □	1200	30 x 35	3.25	4.55	0.207	0.114	ECOS2CP122D □
4700	30 x 50	5.13	5.90	0.071	0.049	ECOS2AP472D □	1200	35 x 30	3.25	4.55	0.207	0.114	ECOS2CP122E □
4700	35 x 40	5.13	5.90	0.071	0.049	ECOS2AP472E □	1500	30 x 45	3.73	5.22	0.166	0.091	ECOS2CP152D □
5600	35 x 45	5.75	6.61	0.059	0.041	ECOS2AP562E □	1500	35 x 35	3.73	5.22	0.166	0.091	ECOS2CP152E □
6800	35 x 50	6.60	7.59	0.049	0.037	ECOS2AP682E □	1800	30 x 50	4.20	5.88	0.138	0.083	ECOS2CP182D □
							1800	35 x 40	4.20	5.88	0.138	0.083	ECOS2CP182E □
							2200	35 x 45	4.78	6.69	0.113	0.073	ECOS2CP222E □
							2700	35 x 50	5.45	7.63	0.092	0.060	ECOS2CP272E □

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.	Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.
		120Hz	10k–50kHz	120Hz	20kHz				120Hz	10k–50kHz	120Hz	20kHz	
200 VDC Working, 250 VDC Surge							250 VDC Working, 300 VDC Surge						
150	22 x 20	0.65	0.91	1.326	0.597	ECOS2DP151B □	120	22 x 20	0.45	0.63	1.658	0.663	ECOS2EP121B □
220	25 x 20	0.87	1.22	0.904	0.407	ECOS2DP221C □	150	25 x 20	0.65	0.91	1.326	0.531	ECOS2EP151C □
270	20 x 30	1.41	1.97	0.614	0.276	ECOS2DP271A □	180	20 x 30	1.07	1.50	0.921	0.368	ECOS2EP181A □
270	22 x 25	1.41	1.97	0.614	0.276	ECOS2DP271B □	180	22 x 25	1.07	1.50	0.921	0.368	ECOS2EP181B □
330	20 x 35	1.56	2.18	0.553	0.249	ECOS2DP331A □	220	20 x 35	1.17	1.64	0.754	0.301	ECOS2EP221A □
330	22 x 30	1.56	2.18	0.553	0.249	ECOS2DP331B □	220	22 x 30	1.17	1.64	0.904	0.362	ECOS2EP221B □
330	25 x 25	1.56	2.18	0.553	0.249	ECOS2DP331C □	220	25 x 25	1.17	1.64	0.754	0.301	ECOS2EP221C □
330	30 x 20	1.00	1.40	0.653	0.294	ECOS2DP331D □	220	30 x 20	0.87	1.22	0.754	0.301	ECOS2EP221D □
390	22 x 30	1.68	2.35	0.468	0.210	ECOS2DP391B □	270	22 x 30	1.31	1.83	0.614	0.246	ECOS2EP271B □
390	25 x 25	1.68	2.35	0.468	0.210	ECOS2DP391C □	270	25 x 25	1.31	1.83	0.614	0.246	ECOS2EP271C □
470	22 x 35	1.85	2.59	0.388	0.175	ECOS2DP471B □	330	22 x 35	1.75	2.45	0.553	0.221	ECOS2EP331B □
470	25 x 30	1.85	2.59	0.388	0.175	ECOS2DP471C □	330	25 x 30	1.75	2.45	0.553	0.221	ECOS2EP331C □
470	30 x 25	1.85	2.59	0.388	0.175	ECOS2DP471D □	330	30 x 25	1.75	2.45	0.653	0.261	ECOS2EP331D □
470	35 x 20	1.30	1.82	0.459	0.206	ECOS2DP471E □	330	35 x 20	1.10	1.54	0.553	0.221	ECOS2EP331E □
560	22 x 40	2.43	3.40	0.326	0.147	ECOS2DP561B □	390	22 x 40	1.91	2.67	0.468	0.187	ECOS2EP391B □
560	25 x 35	2.43	3.40	0.326	0.147	ECOS2DP561C □	390	25 x 35	1.91	2.67	0.468	0.187	ECOS2EP391C □
560	30 x 25	2.43	3.40	0.326	0.147	ECOS2DP561D □	390	30 x 25	1.91	2.67	0.468	0.187	ECOS2EP391D □
680	22 x 45	2.68	3.75	0.268	0.121	ECOS2DP681B □	470	22 x 45	2.11	2.95	0.388	0.155	ECOS2EP471B □
680	25 x 35	2.68	3.75	0.268	0.121	ECOS2DP681C □	470	25 x 40	2.11	2.95	0.388	0.155	ECOS2EP471C □
680	30 x 30	2.68	3.75	0.268	0.121	ECOS2DP681D □	470	30 x 30	2.11	2.95	0.388	0.155	ECOS2EP471D □
820	25 x 45	2.93	4.10	0.222	0.100	ECOS2DP821C □	560	25 x 45	2.25	3.15	0.326	0.130	ECOS2EP561C □
820	30 x 35	2.93	4.10	0.222	0.100	ECOS2DP821D □	560	30 x 35	2.25	3.15	0.326	0.130	ECOS2EP561D □
820	35 x 25	2.93	4.10	0.243	0.109	ECOS2DP821E □	560	35 x 25	2.25	3.15	0.326	0.130	ECOS2EP561E □
1000	25 x 50	3.25	4.55	0.199	0.090	ECOS2DP102C □	680	25 x 50	2.50	3.50	0.268	0.107	ECOS2EP681C □
1000	30 x 40	3.25	4.55	0.199	0.090	ECOS2DP102D □	680	30 x 40	2.50	3.50	0.268	0.107	ECOS2EP681D □
1000	35 x 30	3.25	4.55	0.199	0.090	ECOS2DP102E □	680	35 x 30	2.50	3.50	0.268	0.107	ECOS2EP681E □
1200	30 x 45	3.50	4.90	0.166	0.075	ECOS2DP122D □	820	30 x 45	2.77	3.88	0.222	0.089	ECOS2EP821D □
1200	35 x 35	3.50	4.90	0.166	0.075	ECOS2DP122E □	820	35 x 35	2.77	3.88	0.222	0.089	ECOS2EP821E □
1500	30 x 50	3.87	5.42	0.144	0.072	ECOS2DP153D □	1000	30 x 50	3.32	4.65	0.199	0.090	ECOS2EP102D □
1500	35 x 40	3.87	5.42	0.144	0.072	ECOS2DP153E □	1000	35 x 40	3.32	4.65	0.199	0.090	ECOS2EP102E □
1800	35 x 45	4.32	6.05	0.120	0.060	ECOS2DP182E □	1200	35 x 45	3.53	4.94	0.168	0.083	ECOS2EP122E □
2200	35 x 50	4.92	6.89	0.098	0.054	ECOS2DP222E □	1500	35 x 50	4.04	5.66	0.133	0.066	ECOS2EP152E □

■ TS-UP Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.		Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR (Ω max.)		Panasonic Part No.	
		120Hz	10k-50kHz	120Hz	20kHz					120Hz	10k-50kHz	120Hz	20kHz		
350 VDC Working, 400 VDC Surge								385 VDC Working, 435 VDC Surge							
82	20 x 30	0.83	1.16	2.022	0.708	ECOS2VP820A	□	47	22 x 20	0.25	0.35	4.233	1.481	ECOS2TP470B	□
82	22 x 25	0.83	1.16	2.022	0.708	ECOS2VP820B	□	68	20 x 30	0.76	1.06	2.438	0.853	ECOS2TP680A	□
100	20 x 35	0.91	1.27	1.658	0.580	ECOS2VP101A	□	68	22 x 25	0.76	1.06	2.438	0.853	ECOS2TP680B	□
100	22 x 30	0.91	1.27	1.658	0.580	ECOS2VP101B	□	68	25 x 20	0.35	0.49	2.926	1.024	ECOS2TP680C	□
120	22 x 30	1.00	1.40	1.382	0.484	ECOS2VP121B	□	82	20 x 30	0.83	1.16	2.022	0.708	ECOS2TP820A	□
120	25 x 25	1.00	1.40	1.382	0.484	ECOS2VP121C	□	82	22 x 25	0.83	1.16	2.022	0.708	ECOS2TP820B	□
150	22 x 35	1.12	1.57	1.105	0.387	ECOS2VP151B	□	100	20 x 35	0.92	1.29	1.658	0.580	ECOS2TP101A	□
150	25 x 30	1.12	1.57	1.105	0.387	ECOS2VP151C	□	100	22 x 30	0.92	1.29	1.658	0.580	ECOS2TP101B	□
150	30 x 25	1.12	1.57	1.105	0.387	ECOS2VP151D	□	100	25 x 25	0.92	1.29	1.658	0.580	ECOS2TP101C	□
180	22 x 40	1.22	1.71	0.921	0.322	ECOS2VP181B	□	100	30 x 20	0.47	0.66	1.989	0.696	ECOS2TP101D	□
180	25 x 35	1.22	1.71	0.921	0.322	ECOS2VP181C	□	120	20 x 40	1.02	1.43	1.382	0.553	ECOS2TP121A	□
180	30 x 25	1.22	1.71	0.921	0.322	ECOS2VP181D	□	120	22 x 35	1.02	1.43	1.382	0.553	ECOS2TP121B	□
220	22 x 45	1.44	2.02	0.754	0.264	ECOS2VP221B	□	120	25 x 30	1.02	1.43	1.382	0.553	ECOS2TP121E	□
220	25 x 40	1.44	2.02	0.754	0.264	ECOS2VP221C	□	150	22 x 40	1.16	1.62	1.105	0.442	ECOS2TP151B	□
220	30 x 30	1.44	2.02	0.754	0.264	ECOS2VP221D	□	150	25 x 30	1.16	1.62	1.105	0.442	ECOS2TP151C	□
220	35 x 25	1.44	2.02	0.754	0.264	ECOS2VP221E	□	150	30 x 25	1.16	1.62	1.105	0.442	ECOS2TP151D	□
270	35 x 45	1.66	2.32	0.614	0.215	ECOS2VP271E	□	150	35 x 20	0.60	0.84	1.326	0.531	ECOS2TP151E	□
270	30 x 35	1.66	2.32	0.614	0.215	ECOS2VP271D	□	180	22 x 45	1.44	2.02	0.921	0.368	ECOS2TP181B	□
270	35 x 30	1.66	2.32	0.614	0.215	ECOS2VP271E	□	180	25 x 35	1.44	2.02	0.921	0.368	ECOS2TP181C	□
330	25 x 50	1.88	2.63	0.502	0.176	ECOS2VP331C	□	180	30 x 30	1.44	2.02	0.921	0.368	ECOS2TP181D	□
330	30 x 40	1.88	2.63	0.502	0.176	ECOS2VP331D	□	220	22 x 50	1.49	2.09	0.829	0.373	ECOS2TP221B	□
330	35 x 30	1.88	2.63	0.502	0.176	ECOS2VP331E	□	220	25 x 40	1.49	2.09	0.829	0.373	ECOS2TP221C	□
390	30 x 45	2.06	2.88	0.468	0.164	ECOS2VP391D	□	220	30 x 30	1.49	2.09	0.829	0.373	ECOS2TP221D	□
390	35 x 35	2.06	2.88	0.468	0.164	ECOS2VP391E	□	270	25 x 45	1.67	2.34	0.675	0.304	ECOS2TP271C	□
470	30 x 50	2.40	3.36	0.388	0.136	ECOS2VP471D	□	270	30 x 35	1.67	2.34	0.675	0.304	ECOS2TP271D	□
470	35 x 40	2.40	3.36	0.388	0.136	ECOS2VP471E	□	270	35 x 30	1.67	2.34	0.675	0.304	ECOS2TP271E	□
560	35 x 45	2.60	3.64	0.355	0.142	ECOS2VP561E	□	330	30 x 40	1.90	2.66	0.553	0.249	ECOS2TP331D	□
680	35 x 50	2.96	4.14	0.293	0.117	ECOS2VP681E	□	330	35 x 35	1.90	2.66	0.553	0.249	ECOS2TP331E	□
								390	30 x 45	2.13	2.98	0.468	0.210	ECOS2TP391D	□
								390	35 x 40	2.13	2.98	0.468	0.210	ECOS2TP391E	□
								470	35 x 45	2.39	3.35	0.388	0.175	ECOS2TP471E	□
								560	35 x 50	2.69	3.77	0.326	0.147	ECOS2TP561E	□

Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR ($\pm$ max.)		Panasonic Part No.		Cap. (μ F)	Size (mm) D x L	Max. 85°C Ripple (Arms)		20°C ESR ($\pm$ max.)		Panasonic Part No.	
		120Hz	10k-50kHz	120Hz	20kHz					120Hz	10k-50kHz	120Hz	20kHz		
400 VDC Working, 450 VDC Surge								450 VDC Working, 500 VDC Surge							
47	22 x 20	0.25	0.35	3.527	1.235	ECOS2GP470B	□	33	22 x 20	0.20	0.28	6.028	2.411	ECOS2WP330B	□
68	20 x 30	0.76	1.06	2.438	0.853	ECOS2GP680A	□	47	25 x 20	0.29	0.41	4.233	1.693	ECOS2WP470C	□
68	22 x 25	0.76	1.06	2.438	0.853	ECOS2GP680B	□	56	20 x 30	0.70	0.98	2.960	1.184	ECOS2WP560A	□
68	25 x 20	0.35	0.49	2.926	1.024	ECOS2GP680C	□	56	22 x 25	0.70	0.98	2.960	1.184	ECOS2WP560B	□
82	20 x 30	0.83	1.16	2.022	0.708	ECOS2GP820A	□	68	20 x 35	0.76	1.06	2.438	0.975	ECOS2WP680A	□
82	22 x 25	0.83	1.16	2.022	0.708	ECOS2GP820B	□	68	22 x 30	0.76	1.06	2.438	0.975	ECOS2WP680B	□
100	20 x 35	0.92	1.29	1.658	0.580	ECOS2GP101A	□	68	30 x 20	0.38	0.53	2.926	1.170	ECOS2WP680C	□
100	22 x 30	0.92	1.29	1.658	0.580	ECOS2GP101B	□	82	20 x 35	0.83	1.16	2.022	0.809	ECOS2WP820A	□
100	25 x 25	0.92	1.29	1.658	0.580	ECOS2GP101C	□	82	22 x 30	0.83	1.16	2.022	0.809	ECOS2WP820B	□
100	30 x 20	0.47	0.66	1.989	0.696	ECOS2GP101D	□	82	25 x 25	0.83	1.16	2.022	0.809	ECOS2WP820C	□
120	20 x 40	1.02	1.43	1.382	0.484	ECOS2GP121A	□	100	22 x 35	0.93	1.30	1.658	0.663	ECOS2WP101B	□
120	22 x 35	1.02	1.43	1.382	0.484	ECOS2GP121B	□	100	25 x 30	0.93	1.30	1.658	0.663	ECOS2WP101C	□
120	25 x 30	1.02	1.43	1.382	0.484	ECOS2GP121C	□	100	30 x 25	0.93	1.30	1.658	0.663	ECOS2WP101D	□
150	22 x 40	1.16	1.62	1.105	0.387	ECOS2GP151B	□	100	35 x 20	0.52	0.73	1.989	0.796	ECOS2WP101E	□
150	25 x 30	1.16	1.62	1.105	0.387	ECOS2GP151C	□	120	22 x 40	1.04	1.46	1.382	0.553	ECOS2WP121B	□
150	30 x 25	1.16	1.62	1.105	0.387	ECOS2GP151D	□	120	25 x 30	1.04	1.46	1.382	0.553	ECOS2WP121C	□
150	35 x 20	0.60	0.84	1.326	0.464	ECOS2GP151E	□	120	30 x 25	1.04	1.46	1.382	0.553	ECOS2WP121D	□
180	22 x 45	1.44	2.02	0.921	0.322	ECOS2GP181B	□	150	22 x 50	1.19	1.67	1.105	0.442	ECOS2WP151B	□
180	25 x 35	1.44	2.02	0.921	0.322	ECOS2GP181C	□	150	25 x 40	1.19	1.67	1.105	0.442	ECOS2WP151C	□
180	30 x 30	1.44	2.02	0.921	0.322	ECOS2GP181D	□	150	30 x 30	1.19	1.67	1.105	0.442	ECOS2WP151D	□
220	22 x 50	1.49	2.09	0.754	0.264	ECOS2GP221B	□	180	25 x 45	1.35	1.89	0.921	0.368	ECOS2WP181C	□
220	25 x 40	1.49	2.09	0.754	0.264	ECOS2GP221C	□	180	30 x 35	1.35	1.89	0.921	0.368	ECOS2WP181D	□
220	30 x 30	1.49	2.09	0.754	0.264	ECOS2GP221D	□	180	35 x 25	1.35	1.89	0.921	0.368	ECOS2WP181E	□
270	25 x 45	1.67	2.34	0.675	0.236	ECOS2GP271C	□	220	25 x 50	1.55	2.17	0.754	0.301	ECOS2WP221C	□
270	30 x 35	1.67	2.34	0.675	0.236	ECOS2GP271D	□	220	30 x 40	1.55	2.17	0.754	0.301	ECOS2WP221D	□
270	35 x 30	1.67	2.34	0.675	0.236	ECOS2GP271E	□	220	35 x 30	1.55	2.17	0.754	0.301	ECOS2WP221E	□
330	30 x 40	1.90	2.66	0.553	0.193	ECOS2GP331D	□	270	30 x 45	1.78	2.49	0.675	0.270	ECOS2WP271D	□
330	35 x 35	1.90	2.66	0.553	0.193	ECOS2GP331E	□	270	35 x 35	1.78	2.49	0.675	0.270	ECOS2WP271E	□
390	30 x 45	2.13	2.98	0.468	0.164	ECOS2GP391D	□	330	30 x 50	2.01	2.81	0.553	0.249	ECOS2WP331D	□
390	35 x 40	2.13	2.98	0.468	0.164	ECOS2GP391E	□	330	35 x 40	2.01	2.81	0.553	0.249	ECOS2WP331E	□
470	35 x 45	2.39	3.35	0.388	0.136	ECOS2GP471E	□	390	35 x 45	2.24	3.14	0.510	0.255	ECOS2WP391E	□
560	35 x 50	2.69	3.77	0.326	0.114	ECOS2GP561E	□	470	35 x 50	2.53	3.54	0.423	0.233	ECOS2WP471E	□