

### 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



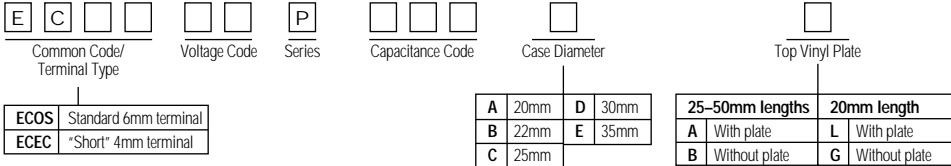
#### ■ Specifications

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: (rated cap. [µF] - 33000 µF / 10000 µF) × 0.1

Endurance	2000 hours at +85°C with maximum specified ripple current
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#### ■ Part Number System



#### ■ 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													
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	15000	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. (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	
35 VDC Working, 44 VDC Surge							50 VDC Working, 63 VDC Surge						
2200	22 x 20	1.40	1.61	0.181	0.136	ECOS1VP2222B □	1500	22 x 20	1.20	1.38	0.254	0.191	ECOS1HP1522B □
3300	20 x 25	2.73	3.14	0.111	0.083	ECOS1VP3322A □	2200	20 x 25	2.26	2.60	0.151	0.113	ECOS1HP2222A □
3300	25 x 20	1.70	1.96	0.121	0.090	ECOS1VP3322C □	2200	25 x 20	1.40	1.61	0.173	0.130	ECOS1HP2222C □
3900	20 x 30	2.94	3.38	0.094	0.070	ECOS1VP3922A □	2700	20 x 30	2.52	2.90	0.123	0.092	ECOS1HP2722A □
4700	20 x 35	3.26	3.75	0.078	0.058	ECOS1VP4722A □	3300	20 x 35	2.73	3.14	0.100	0.075	ECOS1HP3322A □
4700	22 x 30	3.26	3.75	0.078	0.058	ECOS1VP4722B □	3300	22 x 30	2.73	3.14	0.100	0.075	ECOS1HP3322B □
4700	25 x 25	3.26	3.75	0.078	0.058	ECOS1VP4722C □	3300	25 x 25	2.73	3.14	0.100	0.075	ECOS1HP3322C □
4700	30 x 20	2.00	2.30	0.088	0.066	ECOS1VP4722D □	3300	30 x 20	1.70	1.96	0.116	0.087	ECOS1HP3322D □
5600	20 x 40	3.36	3.86	0.080	0.060	ECOS1VP5622A □	3900	20 x 40	2.75	3.16	0.085	0.064	ECOS1HP3922A □
5600	22 x 30	3.36	3.86	0.080	0.060	ECOS1VP5622B □	3900	22 x 30	2.75	3.16	0.085	0.064	ECOS1HP3922B □
5600	25 x 25	3.36	3.86	0.080	0.060	ECOS1VP5622C □	3900	25 x 25	2.75	3.16	0.085	0.064	ECOS1HP3922C □
6800	22 x 35	3.68	4.23	0.066	0.049	ECOS1VP6822B □	4700	22 x 35	3.03	3.48	0.071	0.053	ECOS1HP4722B □
6800	25 x 30	3.68	4.23	0.066	0.049	ECOS1VP6822C □	4700	25 x 30	3.03	3.48	0.071	0.053	ECOS1HP4722C □
6800	35 x 20	2.40	2.76	0.071	0.053	ECOS1VP6822E □	4700	30 x 25	3.03	3.48	0.071	0.053	ECOS1HP4722D □
8200	22 x 40	4.00	4.60	0.057	0.042	ECOS1VP8222B □	4700	35 x 20	2.10	2.42	0.081	0.061	ECOS1HP4722E □
8200	25 x 35	4.00	4.60	0.057	0.042	ECOS1VP8222C □	5600	22 x 40	3.42	3.93	0.059	0.044	ECOS1HP5622B □
10000	22 x 45	4.42	5.08	0.050	0.037	ECOS1VP1032B □	5600	25 x 35	3.42	3.93	0.059	0.044	ECOS1HP5622C □
10000	25 x 40	4.42	5.08	0.050	0.037	ECOS1VP1032C □	5600	30 x 30	3.42	3.93	0.059	0.044	ECOS1HP5622D □
10000	30 x 30	4.42	5.08	0.050	0.037	ECOS1VP1032D □	6800	22 x 50	3.85	4.43	0.049	0.037	ECOS1HP6822B □
10000	35 x 25	4.42	5.08	0.050	0.037	ECOS1VP1032E □	6800	25 x 40	3.85	4.43	0.049	0.037	ECOS1HP6822C □
12000	25 x 45	5.05	5.81	0.044	0.033	ECOS1VP1232C □	6800	30 x 30	3.85	4.43	0.049	0.037	ECOS1HP6822D □
12000	30 x 35	5.05	5.81	0.044	0.033	ECOS1VP1232D □	8200	25 x 45	4.41	5.07	0.040	0.030	ECOS1HP8222C □
12000	35 x 30	5.05	5.81	0.044	0.033	ECOS1VP1232E □	8200	30 x 35	4.41	5.07	0.040	0.030	ECOS1HP8222D □
15000	25 x 50	5.57	6.41	0.036	0.027	ECOS1VP1532C □	10000	25 x 50	4.97	5.72	0.036	0.027	ECOS1HP1032C □
15000	30 x 40	5.57	6.41	0.036	0.027	ECOS1VP1532D □	10000	30 x 40	4.97	5.72	0.036	0.027	ECOS1HP1032D □
15000	35 x 30	5.57	6.41	0.036	0.027	ECOS1VP1532E □	10000	35 x 30	4.97	5.72	0.036	0.027	ECOS1HP1032E □
18000	30 x 45	5.68	6.53	0.030	0.023	ECOS1VP1832D □	12000	30 x 45	5.58	6.42	0.032	0.024	ECOS1HP1232D □
18000	35 x 35	5.68	6.53	0.030	0.023	ECOS1VP1832E □	12000	35 x 35	5.58	6.42	0.032	0.024	ECOS1HP1232E □
22000	30 x 50	6.10	7.02	0.026	0.020	ECOS1VP2232D □	15000	30 x 50	6.44	7.41	0.028	0.021	ECOS1HP1532D □
22000	35 x 40	6.10	7.02	0.026	0.020	ECOS1VP2232E □	15000	35 x 40	6.44	7.41	0.028	0.021	ECOS1HP1532E □
27000	35 x 45	6.84	7.87	0.021	0.017	ECOS1VP2732E □	18000	35 x 45	6.94	7.98	0.023	0.018	ECOS1HP1832E □
33000	35 x 50	7.15	8.22	0.018	0.014	ECOS1VP3332E □	22000	35 x 50	7.57	8.71	0.021	0.017	ECPS1HP2232C □

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	
63 VDC Working, 79 VDC Surge							80 VDC Working, 100 VDC Surge						
1000	22 x 20	1.20	1.38	0.381	0.286	ECOS1JP1032B □	680	22 x 20	1.00	1.15	0.439	0.329	ECOS1KP6812B □
1500	25 x 20	1.30	1.50	0.254	0.191	ECOS1JP1522C □	1000	25 x 20	1.20	1.38	0.298	0.244	ECOS1KP1022B □
2200	20 x 35	2.52	2.90	0.151	0.113	ECOS1JP2222A □	1500	20 x 35	2.26	2.60	0.177	0.133	ECOS1KP1522A □
2200	22 x 30	2.52	2.90	0.151	0.113	ECOS1JP2222B □	1500	22 x 30	2.26	2.60	0.177	0.133	ECOS1KP1522B □
2200	25 x 25	2.52	2.90	0.151	0.113	ECOS1JP2222C □	1500	25 x 25	2.26	2.60	0.177	0.133	ECOS1KP1522C □
2200	30 x 20	1.50	1.73	0.173	0.130	ECOS1JP2222D □	1500	30 x 20	1.40	1.61	0.199	0.149	ECOS1KP1522D □
2700	20 x 40	3.73	4.29	0.123	0.092	ECOS1JP2722A □	1800	20 x 40	2.52	2.90	0.147	0.111	ECOS1KP1822A □
2700	22 x 35	3.73	4.29	0.123	0.092	ECOS1JP2722B □	1800	22 x 35	2.52	2.90	0.147	0.111	ECOS1KP1822B □
2700	25 x 30	3.73	4.29	0.123	0.092	ECOS1JP2722C □	1800	25 x 30	2.52	2.90	0.147	0.111	ECOS1KP1822C □
3300	22 x 40	4.10	4.72	0.105	0.079	ECOS1JP3322B □	2200	22 x 40	2.73	3.14	0.121	0.090	ECOS1KP2222B □
3300	25 x 30	4.10	4.72	0.105	0.079	ECOS1JP3322C □	2200	25 x 30	2.73	3.14	0.121	0.090	ECOS1KP2222C □
3300	30 x 25	4.10	4.72	0.105	0.079	ECOS1JP3322D □	2200	30 x 25	2.73	3.14	0.121	0.090	ECOS1KP2222D □
3300	35 x 20	1.70	1.96	0.126	0.094	ECOS1JP3322E □	2200	35 x 20	1.70	1.96	0.136	0.102	ECOS1KP2222E □
3900	22 x 45	4.44	5.11	0.098	0.073	ECOS1JP3922B □	2700	22 x 45	2.78	3.20	0.098	0.074	ECOS1KP2722B □
3900	25 x 35	4.44	5.11	0.098	0.073	ECOS1JP3922C □	2700	25 x 35	2.78	3.20	0.098	0.074	ECOS1KP2722C □
3900	30 x 30	4.44	5.11	0.098	0.073	ECOS1JP3922D □	2700	30 x 30	2.78	3.20	0.098	0.074	ECOS1KP2722D □
4700	22 x 50	4.86	5.59	0.081	0.061	ECOS1JP4722B □	3300	22 x 50	3.21	3.69	0.085	0.064	ECOS1KP3322B □
4700	25 x 40	4.86	5.59	0.081	0.061	ECOS1JP4722C □	3300	25 x 40	3.21	3.69	0.085	0.064	ECOS1KP3322C □
4700	30 x 30	4.86	5.59	0.081	0.061	ECOS1JP4722D □	3300	30 x 30	3.21	3.69	0.085	0.064	ECOS1KP3322D □
4700	35 x 25	4.86	5.59	0.081	0.061	ECOS1JP4722E □	3900	25 x 45	3.59	4.13	0.077	0.057	ECOS1KP3922C □
5600	25 x 45	5.36	6.16	0.068	0.051	ECOS1JP5622C □	3900	30 x 35	3.59	4.13	0.077	0.057	ECOS1KP3922D □
5600	30 x 35	5.36	6.16	0.068	0.051	ECOS1JP5622D □	4700	25 x 50	4.09	4.70	0.063	0.048	ECOS1KP4722C □
5600	35 x 30	5.36	6.16	0.068	0.051	ECOS1JP5622E □	4700	30 x 40	4.09	4.70	0.063	0.048	ECOS1KP4722D □
6800	25 x 50	5.84	6.72	0.061	0.046	ECOS1JP6822C □	5600	30 x 45	4.55	5.23	0.056	0.042	ECOS1KP5622D □
6800	30 x 40	5.84	6.72	0.061	0.046	ECOS1JP6822D □	5600	35 x 35	4.55	5.23	0.056	0.042	ECOS1KP5622E □
6800	35 x 30	5.84	6.72	0.061	0.046	ECOS1JP6822E □	6800	30 x 50	5.16	5.93	0.046	0.035	ECOS1KP6822D □
8200	30 x 45	6.00	6.90	0.051	0.038	ECOS1JP8222D □	6800	35 x 40	5.16	5.93	0.046	0.035	ECOS1KP6822E □
8200	35 x 35	6.00	6.90	0.051	0.038	ECOS1JP8222E □	8200	35 x 50	5.83	6.70	0.038	0.029	ECOS1KP8222E □
10000	35 x 40	6.52	7.50	0.041	0.033	ECOS1JP1032E □							
12000	35 x 50	7.15	8.22	0.035	0.028	ECOS1JP1232E □							

■ TS-UP Standard Ratings (continued)

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	
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. (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	
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. (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	
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	ECOS2TP121C □
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. (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	
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 □