TS-HA/HB Series *105°C, 3000 hours*



- ***Long 3000 hour life at 105°C with high ripple current capability***
- ***2 and 3 pin versions available***
- ***Can vent construction***

Rated Working Voltage:	10 ~ 250 VDC	385 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	180~68000µF	82~560µF
Capacitance Tolerance:	± 20%	

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: $\frac{\text{(rated cap. [µF] - 33000)}}{1000}$

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

Ripple Current Ambient Temperature Factors**

Temperature (°C):	105°C	85°C	70°C	60°C	≤45°C
Multiplier:	1.0	1.7	2.0	2.2	2.35

Endurance: 3000 hours* at +105°C with maximum specified ripple current (see page 4)
*2000 hours for 20mm length sizes

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

Part Number System

E C □ □ | □ □ | A / B | □ □ □ | □ | □

Series Code (A / B) | Capacitance Code | Suffix | Diameter

Suffix

A	Standard Ratings
X	Extended CV Ratings
L	20mm Length Ratings

RoHS compliant PVC sleeve and top plate is standard. PET sleeve is available without top plate.

Diameter

Diameter	Code
22	B
25	C
30	D
35	E

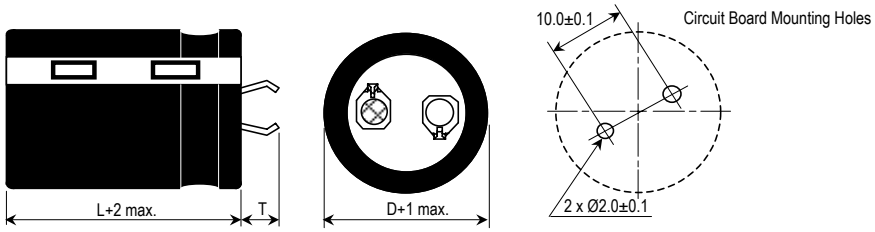
Terminal Style

Prefix	Length	# of Pins
ECOS	6.3mm	2
ECEC	4.0mm	2
ECE3	4.0mm	3

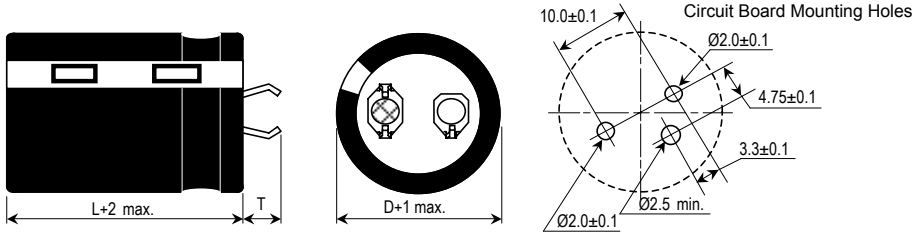
Voltage Code

1A	1C	1E	1V	1H	1J	1K	2A	2C	2D	2E	2T	2G	2W
10	16	25	35	50	63	80	100	160	200	250	385	400	450

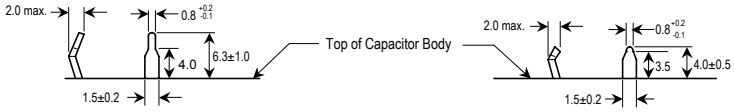
2 Pin Mounting Style



3 Pin Mounting Style



Pin Dimensions



"T" 6.3mm Length: Standard on 2 Pin Mounting Style

4mm Length: Standard on 3 Pin, Available on 2 Pin Mounting Styles

TS-HA Standard Ratings

Part numbers shown with 2 pins

Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
10 VDC Working, 13 VDC Surge							
10000	22 x 25	1.80	2.07	0.075	0.063	**ECOS1AA103BA**	**ECEC1AA103BA**
12000	22 x 30	2.20	2.53	0.062	0.053	**ECOS1AA123BA**	**ECEC1AA123BA**
15000	22 x 35	2.30	2.65	0.053	0.045	**ECOS1AA153BA**	**ECEC1AA153BA**
	25 x 25	2.30	2.65	0.053	0.045	**ECOS1AA153CA**	**ECEC1AA153CA**
18000	22 x 40	2.40	2.76	0.044	0.038	**ECOS1AA183BA**	**ECEC1AA183BA**
	25 x 30	2.40	2.76	0.044	0.038	**ECOS1AA183CA**	**ECEC1AA183CA**
22000	22 x 45	2.60	2.99	0.038	0.032	**ECOS1AA223BA**	**ECEC1AA223BA**
	25 x 35	2.60	2.99	0.038	0.032	**ECOS1AA223CA**	**ECEC1AA223CA**
	30 x 25	2.60	2.99	0.038	0.032	**ECOS1AA223DA**	**ECEC1AA223DA**
27000	22 x 50	3.10	3.57	0.033	0.028	**ECOS1AA273BA**	**ECEC1AA273BA**
	25 x 40	3.10	3.57	0.033	0.028	**ECOS1AA273CA**	**ECEC1AA273CA**
	30 x 30	3.10	3.57	0.033	0.028	**ECOS1AA273DA**	**ECEC1AA273DA**
	35 x 25	3.10	3.57	0.033	0.028	**ECOS1AA273EA**	**ECEC1AA273EA**
33000	25 x 45	3.40	3.91	0.027	0.023	**ECOS1AA333CA**	**ECEC1AA333CA**
	30 x 35	3.40	3.91	0.027	0.023	**ECOS1AA333DA**	**ECEC1AA333DA**
	35 x 30	3.40	3.91	0.027	0.023	**ECOS1AA333EA**	**ECEC1AA333EA**
39000	25 x 50	3.70	4.26	0.025	0.021	**ECOS1AA393CA**	**ECEC1AA393CA**
	30 x 40	3.70	4.26	0.025	0.021	**ECOS1AA393DA**	**ECEC1AA393DA**
	35 x 30	3.70	4.26	0.025	0.021	**ECOS1AA393EA**	**ECEC1AA393EA**
47000	30 x 45	4.20	4.83	0.023	0.020	**ECOS1AA473DA**	**ECEC1AA473DA**
	35 x 35	4.20	4.83	0.023	0.020	**ECOS1AA473EA**	**ECEC1AA473EA**
56000	30 x 50	5.00	5.75	0.022	0.019	**ECOS1AA563DA**	**ECEC1AA563DA**
	35 x 40	5.00	5.75	0.022	0.021	**ECOS1AA563EA**	**ECEC1AA563EA**
68000	35 x 50	5.50	6.33	0.021	0.020	**ECOS1AA683EA**	**ECEC1AA683EA**
16 VDC Working, 20 VDC Surge							
3300	22 x 20	1.30	1.50	0.216	0.173	**ECOS1CA332BL**	**ECEC1CA332BL**
4700	25 x 20	1.60	1.84	0.152	0.121	**ECOS1CA472CL**	**ECEC1CA472CL**
6800	22 x 25	2.20	2.53	0.085	0.068	**ECOS1CA682BA**	**ECEC1CA682BA**
	30 x 20	1.80	2.07	0.105	0.084	**ECOS1CA682DL**	**ECEC1CA682DL**
8200	22 x 30	2.40	2.76	0.071	0.057	**ECOS1CA822BA**	**ECEC1CA822BA**
10000	22 x 30	2.60	2.99	0.066	0.053	**ECOS1CA103BA**	**ECEC1CA103BA**
	25 x 25	2.60	2.99	0.066	0.053	**ECOS1CA103CA**	**ECEC1CA103CA**
	35 x 20	2.40	2.76	0.071	0.057	**ECOS1CA103EL**	**ECEC1CA103EL**
12000	22 x 35	2.90	3.34	0.055	0.044	**ECOS1CA123BA**	**ECEC1CA123BA**
	25 x 30	2.90	3.34	0.055	0.044	**ECOS1CA123CA**	**ECEC1CA123CA**
	30 x 25	2.90	3.34	0.055	0.044	**ECOS1CA123DA**	**ECEC1CA123DA**
15000	22 x 40	3.20	3.68	0.046	0.037	**ECOS1CA153BA**	**ECEC1CA153BA**
	25 x 35	3.20	3.68	0.046	0.037	**ECOS1CA153CA**	**ECEC1CA153CA**
	30 x 30	3.20	3.68	0.046	0.037	**ECOS1CA153DA**	**ECEC1CA153DA**
18000	22 x 45	3.50	4.03	0.040	0.034	**ECOS1CA183BA**	**ECEC1CA183BA**
	25 x 40	3.50	4.03	0.040	0.034	**ECOS1CA183CA**	**ECEC1CA183CA**
	30 x 30	3.50	4.03	0.040	0.034	**ECOS1CA183DA**	**ECEC1CA183DA**
	35 x 25	3.50	4.03	0.040	0.034	**ECOS1CA183EA**	**ECEC1CA183EA**
22000	25 x 45	3.80	4.37	0.033	0.028	**ECOS1CA223CA**	**ECEC1CA223CA**
	30 x 35	3.80	4.37	0.033	0.028	**ECOS1CA223DA**	**ECEC1CA223DA**
	35 x 30	3.80	4.37	0.033	0.028	**ECOS1CA223EA**	**ECEC1CA223EA**
27000	25 x 50	4.20	4.83	0.028	0.025	**ECOS1CA273CA**	**ECEC1CA273CA**
	30 x 40	4.20	4.83	0.028	0.025	**ECOS1CA273DA**	**ECEC1CA273DA**
	35 x 30	4.20	4.83	0.028	0.025	**ECOS1CA273EA**	**ECEC1CA273EA**
33000	30 x 45	4.70	5.41	0.023	0.020	**ECOS1CA333DA**	**ECEC1CA333DA**
	35 x 35	4.70	5.41	0.023	0.020	**ECOS1CA333EA**	**ECEC1CA333EA**
39000	30 x 50	5.10	5.87	0.022	0.020	**ECOS1CA393DA**	**ECEC1CA393DA**
	35 x 40	5.10	5.87	0.022	0.020	**ECOS1CA393EA**	**ECEC1CA393EA**
47000	35 x 45	5.50	6.33	0.020	0.018	**ECOS1CA473EA**	**ECEC1CA473EA**
56000	35 x 50	6.00	6.90	0.019	0.017	**ECOS1CA563EA**	**ECEC1CA563EA**
25 VDC Working, 32 VDC Surge							
2200	22 x 20	1.30	1.50	0.241	0.181	**ECOS1EA222BL**	**ECEC1EA222BL**
3300	25 x 20	1.60	1.84	0.161	0.121	**ECOS1EA332CL**	**ECEC1EA332CL**
4700	22 x 25	2.00	2.30	0.106	0.079	**ECOS1EA472BA**	**ECEC1EA472BA**
	30 x 20	1.80	2.07	0.113	0.085	**ECOS1EA472DL**	**ECEC1EA472DL**
5600	22 x 30	2.20	2.53	0.089	0.067	**ECOS1EA562BA**	**ECEC1EA562BA**
6800	22 x 30	2.40	2.76	0.073	0.055	**ECOS1EA682BA**	**ECEC1EA682BA**
	25 x 25	2.40	2.76	0.073	0.055	**ECOS1EA682CA**	**ECEC1EA682CA**
	35 x 20	2.30	2.65	0.080	0.060	**ECOS1EA682EL**	**ECEC1EA682EL**

Design and specifications are subject to change without notice.
Contact the factory or your sales representative for technical specifications before purchase and/or use.
When safety concerns arise, please contact Panasonic immediately for technical consultation.

TS-HA Standard Ratings (continued)

Part numbers shown with 2 pins

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
25 VDC Working, 32 VDC Surge (continued)							
8200	22 x 35	2.70	3.11	0.061	0.045	**ECOS1EA822BA**	**ECEC1EA822BA**
	25 x 30	2.70	3.11	0.061	0.045	**ECOS1EA822CA**	**ECEC1EA822CA**
	30 x 25	2.70	3.11	0.061	0.045	**ECOS1EA822DA**	**ECEC1EA822DA**
10000	22 x 40	3.00	3.45	0.051	0.039	**ECOS1EA103BA**	**ECEC1EA103BA**
	25 x 35	3.00	3.45	0.051	0.039	**ECOS1EA103CA**	**ECEC1EA103CA**
	30 x 30	3.00	3.45	0.051	0.039	**ECOS1EA103DA**	**ECEC1EA103DA**
12000	22 x 45	3.20	3.68	0.044	0.033	**ECOS1EA123BA**	**ECEC1EA123BA**
	25 x 40	3.20	3.68	0.044	0.035	**ECOS1EA123CA**	**ECEC1EA123CA**
	30 x 30	3.20	3.68	0.044	0.035	**ECOS1EA123DA**	**ECEC1EA123DA**
	35 x 25	3.20	3.68	0.044	0.035	**ECOS1EA123EA**	**ECEC1EA123EA**
15000	25 x 45	3.60	4.14	0.036	0.031	**ECOS1EA153CA**	**ECEC1EA153CA**
	30 x 35	3.60	4.14	0.036	0.031	**ECOS1EA153DA**	**ECEC1EA153DA**
	35 x 30	3.60	4.14	0.036	0.031	**ECOS1EA153EA**	**ECEC1EA153EA**
18000	25 x 50	3.90	4.49	0.030	0.027	**ECOS1EA183CA**	**ECEC1EA183CA**
	30 x 40	3.90	4.49	0.030	0.027	**ECOS1EA183DA**	**ECEC1EA183DA**
	35 x 35	3.90	4.49	0.030	0.027	**ECOS1EA183EA**	**ECEC1EA183EA**
22000	30 x 45	4.30	4.95	0.025	0.022	**ECOS1EA223DA**	**ECEC1EA223DA**
	35 x 35	4.30	4.95	0.025	0.022	**ECOS1EA223EA**	**ECEC1EA223EA**
27000	35 x 45	4.80	5.52	0.021	0.019	**ECOS1EA273EA**	**ECEC1EA273EA**
33000	35 x 50	5.50	6.33	0.018	0.016	**ECOS1EA333EA**	**ECEC1EA333EA**
35 VDC Working, 44 VDC Surge							
1500	22 x 20	1.10	1.27	0.287	0.216	**ECOS1VA152BL**	**ECEC1VA152BL**
2200	25 x 20	1.40	1.61	0.196	0.147	**ECOS1VA222CL**	**ECEC1VA222CL**
3300	22 x 25	1.90	2.19	0.121	0.090	**ECOS1VA332BA**	**ECEC1VA332BA**
	30 x 20	1.70	1.96	0.131	0.098	**ECOS1VA332DL**	**ECEC1VA332DL**
3900	22 x 30	2.00	2.30	0.111	0.083	**ECOS1VA392BA**	**ECEC1VA392BA**
4700	22 x 35	2.20	2.53	0.088	0.066	**ECOS1VA472BA**	**ECEC1VA472BA**
	25 x 25	2.20	2.53	0.088	0.066	**ECOS1VA472CA**	**ECEC1VA472CA**
	35 x 20	2.00	2.30	0.095	0.071	**ECOS1VA472EL**	**ECEC1VA472EL**
5600	22 x 35	2.40	2.76	0.074	0.056	**ECOS1VA562BA**	**ECEC1VA562BA**
	25 x 30	2.40	2.76	0.074	0.056	**ECOS1VA562CA**	**ECEC1VA562CA**
	30 x 25	2.40	2.76	0.074	0.056	**ECOS1VA562DA**	**ECEC1VA562DA**
6800	22 x 40	2.60	2.99	0.061	0.046	**ECOS1VA682BA**	**ECEC1VA682BA**
	25 x 35	2.60	2.99	0.061	0.046	**ECOS1VA682CA**	**ECEC1VA682CA**
	30 x 30	2.60	2.99	0.061	0.046	**ECOS1VA682DA**	**ECEC1VA682DA**
8200	22 x 50	2.90	3.34	0.051	0.038	**ECOS1VA822BA**	**ECEC1VA822BA**
	25 x 40	2.90	3.34	0.051	0.038	**ECOS1VA822CA**	**ECEC1VA822CA**
	30 x 30	2.90	3.34	0.051	0.038	**ECOS1VA822DA**	**ECEC1VA822DA**
	35 x 25	2.90	3.34	0.051	0.038	**ECOS1VA822EA**	**ECEC1VA822EA**
10000	25 x 45	3.20	3.68	0.041	0.031	**ECOS1VA103CA**	**ECEC1VA103CA**
	30 x 35	3.20	3.68	0.041	0.031	**ECOS1VA103DA**	**ECEC1VA103DA**
	35 x 30	3.20	3.68	0.041	0.031	**ECOS1VA103EA**	**ECEC1VA103EA**
12000	25 x 50	3.50	4.03	0.035	0.026	**ECOS1VA123CA**	**ECEC1VA123CA**
	30 x 40	3.50	4.03	0.035	0.026	**ECOS1VA123DA**	**ECEC1VA123DA**
	35 x 30	3.50	4.03	0.035	0.026	**ECOS1VA123EA**	**ECEC1VA123EA**
15000	30 x 45	3.90	4.49	0.030	0.022	**ECOS1VA153DA**	**ECEC1VA153DA**
	35 x 35	3.90	4.49	0.030	0.022	**ECOS1VA153EA**	**ECEC1VA153EA**
18000	35 x 40	4.30	4.95	0.028	0.021	**ECOS1VA183EA**	**ECEC1VA183EA**
22000	35 x 50	5.00	5.75	0.023	0.017	**ECOS1VA223EA**	**ECEC1VA223EA**
50 VDC Working, 63 VDC Surge							
1000	22 x 20	0.90	1.04	0.265	0.199	**ECOS1HA102BL**	**ECEC1HA102BL**
1500	25 x 20	1.20	1.38	0.177	0.133	**ECOS1HA152CL**	**ECEC1HA152CL**
1800	22 x 25	1.50	1.73	0.129	0.097	**ECOS1HA182BA**	**ECEC1HA182BA**
2200	22 x 30	1.70	1.96	0.105	0.079	**ECOS1HA222BA**	**ECEC1HA222BA**
	30 x 20	1.40	1.61	0.121	0.090	**ECOS1HA222DL**	**ECEC1HA222DL**
2700	22 x 30	1.80	2.07	0.086	0.064	**ECOS1HA272BA**	**ECEC1HA272BA**
	25 x 25	1.80	2.07	0.086	0.064	**ECOS1HA272CA**	**ECEC1HA272CA**
3300	22 x 35	2.00	2.30	0.070	0.053	**ECOS1HA332BA**	**ECEC1HA332BA**
	25 x 30	2.00	2.30	0.070	0.053	**ECOS1HA332CA**	**ECEC1HA332CA**
	35 x 20	1.70	1.96	0.085	0.064	**ECOS1HA332EL**	**ECEC1HA332EL**
3900	22 x 40	2.20	2.53	0.064	0.048	**ECOS1HA392BA**	**ECEC1HA392BA**
	25 x 35	2.20	2.53	0.064	0.048	**ECOS1HA392CA**	**ECEC1HA392CA**
	30 x 25	2.20	2.53	0.064	0.048	**ECOS1HA392DA**	**ECEC1HA392DA**
4700	22 x 45	2.50	2.88	0.053	0.040	**ECOS1HA472BA**	**ECEC1HA472BA**
	25 x 40	2.50	2.88	0.053	0.040	**ECOS1HA472CA**	**ECEC1HA472CA**

TS-HA Standard Ratings (continued)

Part numbers shown with 2 pins

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
50 VDC Working, 63 VDC Surge (continued)							
4700	30 x 30	2.50	2.88	0.053	0.040	**ECOS1HA472DA**	**ECEC1HA472DA**
	35 x 25	2.50	2.88	0.053	0.040	**ECOS1HA472EA**	**ECEC1HA472EA**
5600	22 x 50	2.80	3.22	0.050	0.038	**ECOS1HA562BA**	**ECEC1HA562BA**
	25 x 40	2.80	3.22	0.050	0.038	**ECOS1HA562CA**	**ECEC1HA562CA**
	30 x 35	2.80	3.22	0.050	0.038	**ECOS1HA562DA**	**ECEC1HA562DA**
	35 x 30	2.80	3.22	0.050	0.038	**ECOS1HA562EA**	**ECEC1HA562EA**
	25 x 50	3.30	3.80	0.046	0.035	**ECOS1HA682CA**	**ECEC1HA682CA**
	30 x 40	3.30	3.80	0.046	0.035	**ECOS1HA682DA**	**ECEC1HA682DA**
6800	35 x 30	3.30	3.80	0.046	0.035	**ECOS1HA682EA**	**ECEC1HA682EA**
8200	30 x 45	3.60	4.14	0.038	0.029	**ECOS1HA822DA**	**ECEC1HA822DA**
	35 x 35	3.60	4.14	0.038	0.029	**ECOS1HA822EA**	**ECEC1HA822EA**
10000	30 x 50	4.00	4.60	0.033	0.025	**ECOS1HA103DA**	**ECEC1HA103DA**
	35 x 40	4.00	4.60	0.033	0.025	**ECOS1HA103EA**	**ECEC1HA103EA**
12000	35 x 45	4.50	5.18	0.028	0.022	**ECOS1HA123EA**	**ECEC1HA123EA**
15000	35 x 50	4.80	5.52	0.022	0.018	**ECOS1HA153EA**	**ECEC1HA153EA**
63 VDC Working, 79 VDC Surge							
680	22 x 20	0.90	1.04	0.463	0.347	**ECOS1JA681BL**	**ECEC1JA681BL**
1000	25 x 20	1.20	1.38	0.315	0.236	**ECOS1JA102CL**	**ECEC1JA102CL**
1200	22 x 25	1.40	1.61	0.235	0.176	**ECOS1JA122BA**	**ECEC1JA122BA**
1500	22 x 30	1.50	1.73	0.188	0.141	**ECOS1JA152BA**	**ECEC1JA152BA**
	30 x 20	1.30	1.50	0.210	0.157	**ECOS1JA152DL**	**ECEC1JA152DL**
1800	22 x 30	1.70	1.96	0.157	0.117	**ECOS1JA182BA**	**ECEC1JA182BA**
	25 x 25	1.70	1.96	0.157	0.117	**ECOS1JA182CA**	**ECEC1JA182CA**
2200	22 x 35	2.00	2.30	0.128	0.096	**ECOS1JA222BA**	**ECEC1JA222BA**
	25 x 30	2.00	2.30	0.128	0.096	**ECOS1JA222CA**	**ECEC1JA222CA**
	35 x 20	1.50	1.73	0.143	0.107	**ECOS1JA222EL**	**ECEC1JA222EL**
2700	22 x 40	2.20	2.53	0.104	0.078	**ECOS1JA272BA**	**ECEC1JA272BA**
	25 x 35	2.20	2.53	0.104	0.078	**ECOS1JA272CA**	**ECEC1JA272CA**
	30 x 25	2.20	2.53	0.104	0.078	**ECOS1JA272DA**	**ECEC1JA272DA**
3300	22 x 50	2.50	2.88	0.090	0.068	**ECOS1JA332BA**	**ECEC1JA332BA**
	25 x 40	2.50	2.88	0.090	0.068	**ECOS1JA332CA**	**ECEC1JA332CA**
	30 x 30	2.50	2.88	0.090	0.068	**ECOS1JA332DA**	**ECEC1JA332DA**
	35 x 25	2.50	2.88	0.090	0.068	**ECOS1JA332EA**	**ECEC1JA332EA**
3900	25 x 45	2.70	3.11	0.077	0.057	**ECOS1JA392CA**	**ECEC1JA392CA**
	30 x 35	2.70	3.11	0.077	0.057	**ECOS1JA392DA**	**ECEC1JA392DA**
	35 x 30	2.70	3.11	0.077	0.057	**ECOS1JA392EA**	**ECEC1JA392EA**
4700	25 x 50	3.00	3.45	0.063	0.048	**ECOS1JA472CA**	**ECEC1JA472CA**
	30 x 40	3.00	3.45	0.063	0.048	**ECOS1JA472DA**	**ECEC1JA472DA**
	35 x 30	3.00	3.45	0.063	0.048	**ECOS1JA472EA**	**ECEC1JA472EA**
5600	30 x 45	3.30	3.80	0.053	0.040	**ECOS1JA562DA**	**ECEC1JA562DA**
	35 x 35	3.30	3.80	0.053	0.040	**ECOS1JA562EA**	**ECEC1JA562EA**
6800	30 x 50	3.60	4.14	0.049	0.037	**ECOS1JA682DA**	**ECEC1JA682DA**
	35 x 40	3.60	4.14	0.049	0.037	**ECOS1JA682EA**	**ECEC1JA682EA**
8200	35 x 45	3.90	4.49	0.040	0.030	**ECOS1JA822EA**	**ECEC1JA822EA**
10000	35 x 50	4.40	5.06	0.033	0.028	**ECOS1JA103EA**	**ECEC1JA103EA**
80 VDC Working, 100 VDC Surge							
470	22 x 20	0.80	0.92	0.459	0.298	**ECOS1KA471BL**	**ECEC1KA471BL**
560	25 x 20	1.00	1.15	0.317	0.206	**ECOS1KA681CL**	**ECEC1KA681CL**
820	22 x 25	1.20	1.38	0.222	0.145	**ECOS1KA821BA**	**ECEC1KA821BA**
1000	22 x 30	1.30	1.50	0.182	0.119	**ECOS1KA102BA**	**ECEC1KA102BA**
	25 x 25	1.30	1.50	0.182	0.119	**ECOS1KA102CA**	**ECEC1KA102CA**
	30 x 20	1.20	1.38	0.216	0.140	**ECOS1KA102DL**	**ECEC1KA102DL**
1200	22 x 30	1.50	1.73	0.166	0.116	**ECOS1KA122BA**	**ECEC1KA122BA**
	25 x 25	1.50	1.73	0.166	0.116	**ECOS1KA122CA**	**ECEC1KA122CA**
1500	22 x 35	1.70	1.96	0.133	0.093	**ECOS1KA152BA**	**ECEC1KA152BA**
	25 x 30	1.70	1.96	0.133	0.093	**ECOS1KA152CA**	**ECEC1KA152CA**
	35 x 20	1.40	1.61	0.155	0.108	**ECOS1KA152EL**	**ECEC1KA152EL**
1800	22 x 40	1.80	2.07	0.111	0.077	**ECOS1KA182BA**	**ECEC1KA182BA**
	25 x 35	1.80	2.07	0.111	0.077	**ECOS1KA182CA**	**ECEC1KA182CA**
	30 x 25	1.80	2.07	0.111	0.077	**ECOS1KA182DA**	**ECEC1KA182DA**
2200	22 x 45	2.10	2.42	0.090	0.063	**ECOS1KA222BA**	**ECEC1KA222BA**
	25 x 35	2.10	2.42	0.090	0.063	**ECOS1KA222CA**	**ECEC1KA222CA**
	30 x 30	2.10	2.42	0.090	0.063	**ECOS1KA222DA**	**ECEC1KA222DA**
	35 x 25	2.10	2.42	0.090	0.063	**ECOS1KA222EA**	**ECEC1KA222EA**

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TS-HA/HB Standard Ratings (continued)

Part numbers shown with 2 pins

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
80 VDC Working, 100 VDC Surge (continued)							
2700	25 x 45	2.40	2.76	0.074	0.055	**ECOS1KA272CA**	**ECEC1KA272CA**
	30 x 35	2.40	2.76	0.074	0.055	**ECOS1KA272DA**	**ECEC1KA272DA**
	35 x 30	2.40	2.76	0.074	0.055	**ECOS1KA272EA**	**ECEC1KA272EA**
3300	25 x 50	2.60	2.99	0.065	0.049	**ECOS1KA332CA**	**ECEC1KA332CA**
	30 x 40	2.60	2.99	0.065	0.049	**ECOS1KA332DA**	**ECEC1KA332DA**
	35 x 30	2.60	2.99	0.065	0.049	**ECOS1KA332EA**	**ECEC1KA332EA**
3900	30 x 45	3.00	3.45	0.060	0.045	**ECOS1KA392DA**	**ECEC1KA392DA**
	35 x 35	3.00	3.45	0.060	0.045	**ECOS1KA392EA**	**ECEC1KA392EA**
4700	30 x 50	3.30	3.80	0.049	0.037	**ECOS1KA472DA**	**ECEC1KA472DA**
	35 x 40	3.30	3.80	0.049	0.037	**ECOS1KA472EA**	**ECEC1KA472EA**
5600	35 x 45	3.70	4.26	0.050	0.038	**ECOS1KA562EA**	**ECEC1KA562EA**
6800	35 x 50	3.90	4.49	0.041	0.031	**ECOS1KA682EA**	**ECEC1KA682EA**
100 VDC Working, 125 VDC Surge							
330	22 x 20	0.80	1.20	0.653	0.392	**ECOS2AA331BL**	**ECEC2AA331BL**
470	25 x 20	1.00	1.50	0.459	0.275	**ECOS2AA471CL**	**ECEC2AA471CL**
560	22 x 25	1.10	1.65	0.296	0.178	**ECOS2AA561BA**	**ECEC2AA561BA**
680	30 x 20	1.10	1.65	0.317	0.190	**ECOS2AA681DL**	**ECEC2AA681DL**
820	22 x 30	1.40	2.10	0.202	0.121	**ECOS2AA821BA**	**ECEC2AA821BA**
	25 x 25	1.40	2.10	0.202	0.121	**ECOS2AA821CA**	**ECEC2AA821CA**
1000	22 x 35	1.70	2.55	0.182	0.109	**ECOS2AA102BA**	**ECEC2AA102BA**
	25 x 30	1.70	2.55	0.182	0.109	**ECOS2AA102CA**	**ECEC2AA102CA**
	35 x 20	1.20	1.80	0.216	0.129	**ECOS2AA102EL**	**ECEC2AA102EL**
1200	22 x 40	1.80	2.70	0.152	0.091	**ECOS2AA122BA**	**ECEC2AA122BA**
	25 x 35	1.80	2.70	0.152	0.091	**ECOS2AA122CA**	**ECEC2AA122CA**
	30 x 25	1.80	2.70	0.152	0.091	**ECOS2AA122DA**	**ECEC2AA122DA**
1500	22 x 45	2.10	3.15	0.122	0.073	**ECOS2AA152BA**	**ECEC2AA152BA**
	25 x 40	2.10	3.15	0.122	0.079	**ECOS2AA152CA**	**ECEC2AA152CA**
	30 x 30	2.10	3.15	0.122	0.079	**ECOS2AA152DA**	**ECEC2AA152DA**
	35 x 25	2.10	3.15	0.122	0.079	**ECOS2AA152EA**	**ECEC2AA152EA**
1800	25 x 45	2.30	3.45	0.111	0.072	**ECOS2AA182CA**	**ECEC2AA182CA**
	30 x 35	2.30	3.45	0.111	0.072	**ECOS2AA182DA**	**ECEC2AA182DA**
	35 x 30	2.30	3.45	0.111	0.072	**ECOS2AA182EA**	**ECEC2AA182EA**
2200	25 x 50	2.60	3.90	0.090	0.059	**ECOS2AA222CA**	**ECEC2AA222CA**
	30 x 40	2.60	3.90	0.090	0.059	**ECOS2AA222DA**	**ECEC2AA222DA**
	35 x 30	2.60	3.90	0.090	0.059	**ECOS2AA222EA**	**ECEC2AA222EA**
2700	30 x 45	2.90	4.35	0.080	0.052	**ECOS2AA272DA**	**ECEC2AA272DA**
	35 x 35	2.90	4.35	0.080	0.052	**ECOS2AA272EA**	**ECEC2AA272EA**
3300	30 x 50	3.20	4.80	0.075	0.053	**ECOS2AA332DA**	**ECEC2AA332DA**
	35 x 40	3.20	4.80	0.075	0.053	**ECOS2AA332EA**	**ECEC2AA332EA**
3900	35 x 45	3.60	5.40	0.064	0.045	**ECOS2AA392EA**	**ECEC2AA392EA**
4700	35 x 50	3.80	5.70	0.053	0.040	**ECOS2AA472EA**	**ECEC2AA472EA**
160 VDC Working, 200 VDC Surge							
470	22 x 30	1.40	1.96	0.423	0.190	**ECOS2CB471BA**	**ECEC2CB471BA**
560	22 x 35	1.50	2.10	0.355	0.160	**ECOS2CB561BA**	**ECEC2CB561BA**
680	22 x 40	1.70	2.38	0.293	0.132	**ECOS2CB681BA**	**ECEC2CB681BA**
	25 x 30	1.70	2.38	0.293	0.132	**ECOS2CB681CA**	**ECEC2CB681CA**
820	22 x 45	2.00	2.80	0.243	0.109	**ECOS2CB821BA**	**ECEC2CB821BA**
	25 x 35	2.00	2.80	0.243	0.109	**ECOS2CB821CA**	**ECEC2CB821CA**
1000	22 x 50	2.20	3.08	0.199	0.090	**ECOS2CB102BA**	**ECEC2CB102BA**
	25 x 40	2.20	3.08	0.199	0.090	**ECOS2CB102CA**	**ECEC2CB102CA**
	30 x 30	2.20	3.08	0.199	0.090	**ECOS2CB102DA**	**ECEC2CB102DA**
	35 x 25	2.20	3.08	0.199	0.090	**ECOS2CB102EA**	**ECEC2CB102EA**
1200	25 x 45	2.30	3.22	0.180	0.090	**ECOS2CB122CA**	**ECEC2CB122CA**
	30 x 35	2.30	3.22	0.180	0.090	**ECOS2CB122DA**	**ECEC2CB122DA**
	35 x 30	2.30	3.22	0.180	0.090	**ECOS2CB122EA**	**ECEC2CB122EA**
1500	30 x 40	2.50	3.50	0.144	0.072	**ECOS2CB152DA**	**ECEC2CB152DA**
	35 x 30	2.50	3.50	0.144	0.072	**ECOS2CB152EA**	**ECEC2CB152EA**
1800	30 x 45	2.70	3.78	0.129	0.064	**ECOS2CB182DA**	**ECEC2CB182DA**
	35 x 35	2.70	3.78	0.129	0.064	**ECOS2CB182EA**	**ECEC2CB182EA**
2200	35 x 45	2.90	4.06	0.105	0.063	**ECOS2CB222EA**	**ECEC2CB222EA**
2700	35 x 50	3.10	4.34	0.086	0.052	**ECOS2CB272EA**	**ECEC2CB272EA**
200 VDC Working, 250 VDC Surge							
390	22 x 30	1.30	1.82	0.510	0.230	**ECOS2DB391BA**	**ECEC2DB391BA**
	25 x 25	1.30	1.82	0.510	0.230	**ECOS2DB391CA**	**ECEC2DB391CA**
470	22 x 35	1.40	1.96	0.423	0.190	**ECOS2DB471BA**	**ECEC2DB471BA**

TS-HB Standard Ratings (continued)

Part numbers shown with 2 pins

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
200 VDC Working, 250 VDC Surge (continued)							
470	25 x 30	1.40	1.96	0.423	0.190	**ECOS2DB471CA**	**ECEC2DB471CA**
560	22 x 40	1.50	2.10	0.355	0.160	**ECOS2DB561BA**	**ECEC2DB561BA**
	25 x 30	1.50	2.10	0.355	0.160	**ECOS2DB561CA**	**ECEC2DB561CA**
	30 x 25	1.50	2.10	0.355	0.160	**ECOS2DB561DA**	**ECEC2DB561DA**
680	22 x 45	1.70	2.38	0.293	0.132	**ECOS2DB681BA**	**ECEC2DB681BA**
	25 x 35	1.70	2.38	0.293	0.132	**ECOS2DB681CA**	**ECEC2DB681CA**
820	25 x 45	2.00	2.80	0.263	0.118	**ECOS2DB821CA**	**ECEC2DB821CA**
	30 x 30	2.00	2.80	0.263	0.118	**ECOS2DB821DA**	**ECEC2DB821DA**
	35 x 25	2.00	2.80	0.263	0.118	**ECOS2DB821EA**	**ECEC2DB821EA**
1000	25 x 50	2.20	3.08	0.216	0.108	**ECOS2DB102CA**	**ECEC2DB102CA**
	30 x 35	2.20	3.08	0.216	0.108	**ECOS2DB102DA**	**ECEC2DB102DA**
	35 x 30	2.20	3.08	0.216	0.108	**ECOS2DB102EA**	**ECEC2DB102EA**
1200	30 x 40	2.30	3.22	0.193	0.097	**ECOS2DB122DA**	**ECEC2DB122DA**
	35 x 35	2.30	3.22	0.193	0.097	**ECOS2DB122EA**	**ECEC2DB122EA**
1500	30 x 50	2.50	3.50	0.155	0.077	**ECOS2DB152DA**	**ECEC2DB152DA**
	35 x 40	2.50	3.50	0.155	0.077	**ECOS2DB152EA**	**ECEC2DB152EA**
1800	35 x 45	2.70	3.78	0.129	0.077	**ECOS2DB182EA**	**ECEC2DB182EA**
2200	35 x 50	2.90	4.06	0.105	0.063	**ECOS2DB222EA**	**ECEC2DB222EA**
250 VDC Working, 300 VDC Surge							
180	22 x 25	0.90	1.26	0.921	0.461	**ECOS2EB181BA**	**ECEC2EB181BA**
220	22 x 30	1.00	1.40	0.754	0.377	**ECOS2EB221BA**	**ECEC2EB221BA**
270	22 x 35	1.10	1.54	0.614	0.307	**ECOS2EB271BA**	**ECEC2EB271BA**
330	22 x 40	1.20	1.68	0.502	0.251	**ECOS2EB331BA**	**ECEC2EB331BA**
	25 x 30	1.20	1.68	0.502	0.251	**ECOS2EB331CA**	**ECEC2EB331CA**
390	22 x 45	1.30	1.82	0.425	0.213	**ECOS2EB391BA**	**ECEC2EB391BA**
	30 x 25	1.30	1.82	0.425	0.213	**ECOS2EB391DA**	**ECEC2EB391DA**
470	22 x 50	1.40	1.96	0.353	0.176	**ECOS2EB471BA**	**ECEC2EB471BA**
	25 x 40	1.40	1.96	0.353	0.176	**ECOS2EB471CA**	**ECEC2EB471CA**
	30 x 30	1.40	1.96	0.353	0.176	**ECOS2EB471DA**	**ECEC2EB471DA**
560	25 x 45	1.50	2.10	0.296	0.148	**ECOS2EB561CA**	**ECEC2EB561CA**
	35 x 25	1.50	2.10	0.296	0.148	**ECOS2EB561EA**	**ECEC2EB561EA**
680	25 x 50	1.70	2.38	0.244	0.134	**ECOS2EB681CA**	**ECEC2EB681CA**
	30 x 40	1.70	2.38	0.244	0.134	**ECOS2EB681DA**	**ECEC2EB681DA**
	35 x 30	1.70	2.38	0.244	0.134	**ECOS2EB681EA**	**ECEC2EB681EA**
820	30 x 45	2.00	2.80	0.202	0.111	**ECOS2EB821DA**	**ECEC2EB821DA**
	35 x 35	2.00	2.80	0.202	0.111	**ECOS2EB821EA**	**ECEC2EB821EA**
1000	30 x 50	2.20	3.08	0.199	0.109	**ECOS2EB102DA**	**ECEC2EB102DA**
	35 x 40	2.20	3.08	0.199	0.109	**ECOS2EB102EA**	**ECEC2EB102EA**
1200	35 x 45	2.30	3.22	0.166	0.099	**ECOS2EB122EA**	**ECEC2EB122EA**
1500	35 x 50	2.50	3.50	0.144	0.093	**ECOS2EB152EA**	**ECEC2EB152EA**
385 VDC Working, 425 VDC Surge							
82	22 x 30	0.64	0.90	2.022	0.809	**ECOS2TB820BA**	**ECEC2TB820BA**
100	22 x 30	0.69	0.97	1.658	0.663	**ECOS2TB101BA**	**ECEC2TB101BA**
	25 x 25	0.69	0.97	1.658	0.663	**ECOS2TB101CA**	**ECEC2TB101CA**
120	22 x 35	0.75	1.05	1.382	0.553	**ECOS2TB121BA**	**ECEC2TB121BA**
	25 x 30	0.75	1.05	1.382	0.553	**ECOS2TB121CA**	**ECEC2TB121CA**
150	22 x 40	0.82	1.15	1.105	0.442	**ECOS2TB151BA**	**ECEC2TB151BA**
	25 x 30	0.82	1.15	1.105	0.442	**ECOS2TB151CA**	**ECEC2TB151CA**
	30 x 25	0.82	1.15	1.105	0.442	**ECOS2TB151DA**	**ECEC2TB151DA**
180	22 x 45	0.95	1.33	0.921	0.368	**ECOS2TB181BA**	**ECEC2TB181BA**
	25 x 35	0.95	1.33	0.921	0.368	**ECOS2TB181CA**	**ECEC2TB181CA**
	30 x 30	0.95	1.33	0.921	0.368	**ECOS2TB181DA**	**ECEC2TB181DA**
220	25 x 45	1.10	1.54	0.754	0.301	**ECOS2TB221CA**	**ECEC2TB221CA**
	30 x 30	1.10	1.54	0.829	0.332	**ECOS2TB221DA**	**ECEC2TB221DA**
	35 x 25	1.10	1.54	0.829	0.332	**ECOS2TB221EA**	**ECEC2TB221EA**
270	25 x 50	1.20	1.68	0.675	0.270	**ECOS2TB271CA**	**ECEC2TB271CA**
	35 x 30	1.20	1.68	0.675	0.270	**ECOS2TB271EA**	**ECEC2TB271EA**
330	30 x 45	1.35	1.89	0.553	0.221	**ECOS2TB331DA**	**ECEC2TB331DA**
	35 x 35	1.35	1.89	0.553	0.221	**ECOS2TB331EA**	**ECEC2TB331EA**
390	30 x 50	1.55	2.17	0.510	0.204	**ECOS2TB391DA**	**ECEC2TB391DA**
470	35 x 45	1.75	2.45	0.423	0.212	**ECOS2TB471EA**	**ECEC2TB471EA**
560	35 x 50	1.80	2.52	0.355	0.178	**ECOS2TB561EA**	**ECEC2TB561EA**
400 VDC Working, 450 VDC Surge							
82	22 x 30	0.64	0.90	2.022	0.708	**ECOS2GB820BA**	**ECEC2GB820BA**
100	22 x 30	0.69	0.97	1.658	0.580	**ECOS2GB101BA**	**ECEC2GB101BA**

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TS-HB Standard Ratings (continued)

Part numbers shown with 2 pins

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A_{rms}) 120Hz	Max 105°C R.C. (A_{rms}) 10kHz~	20°C ESR (Ω, max.) 120Hz	20°C ESR (Ω, max.) 20kHz	Panasonic Part Number (By Terminal Length) 6.3mm Length Terminal	Panasonic Part Number (By Terminal Length) 4.0mm Length Terminal
400 VDC Working, 450 VDC Surge (continued)							
100	25 x 25	0.69	0.97	1.658	0.580	**ECOS2GB101CA**	**ECEC2GB101CA**
120	22 x 35	0.75	1.05	1.382	0.484	**ECOS2GB121BA**	**ECEC2GB121BA**
	25 x 30	0.75	1.05	1.382	0.484	**ECOS2GB121CA**	**ECEC2GB121CA**
150	22 x 40	0.82	1.15	1.105	0.387	**ECOS2GB151BA**	**ECEC2GB151BA**
	25 x 30	0.82	1.15	1.105	0.387	**ECOS2GB151CA**	**ECEC2GB151CA**
	30 x 25	0.82	1.15	1.105	0.387	**ECOS2GB151DA**	**ECEC2GB151DA**
180	22 x 45	0.95	1.33	0.921	0.322	**ECOS2GB181BA**	**ECEC2GB181BA**
	25 x 35	0.95	1.33	0.921	0.322	**ECOS2GB181CA**	**ECEC2GB181CA**
	30 x 30	0.95	1.33	0.921	0.322	**ECOS2GB181DA**	**ECEC2GB181DA**
220	25 x 45	1.10	1.54	0.754	0.264	**ECOS2GB221CA**	**ECEC2GB221CA**
	30 x 30	1.10	1.54	0.754	0.264	**ECOS2GB221DA**	**ECEC2GB221DA**
	35 x 25	1.10	1.54	0.754	0.264	**ECOS2GB221EA**	**ECEC2GB221EA**
270	25 x 50	1.20	1.68	0.614	0.215	**ECOS2GB271CA**	**ECEC2GB271CA**
	30 x 35	1.20	1.68	0.614	0.215	**ECOS2GB271DA**	**ECEC2GB271DA**
	35 x 30	1.20	1.68	0.614	0.215	**ECOS2GB271EA**	**ECEC2GB271EA**
330	30 x 45	1.35	1.89	0.502	0.201	**ECOS2GB331DA**	**ECEC2GB331DA**
	35 x 35	1.35	1.89	0.502	0.201	**ECOS2GB331EA**	**ECEC2GB331EA**
390	30 x 50	1.55	2.17	0.425	0.170	**ECOS2GB391DA**	**ECEC2GB391DA**
	35 x 40	1.55	2.17	0.425	0.170	**ECOS2GB391EA**	**ECEC2GB391EA**
470	35 x 45	1.75	2.45	0.353	0.141	**ECOS2GB471EA**	**ECEC2GB471EA**
560	35 x 50	1.80	2.52	0.296	0.118	**ECOS2GB561EA**	**ECEC2GB561EA**
420 VDC Working, 470 VDC Surge							
100	22 x 30	0.64	0.90	1.824	0.821	**ECOS2SB101BA**	**ECEC2SB101BA**
	25 x 25	0.64	0.90	1.824	0.821	**ECOS2SB101CA**	**ECEC2SB101CA**
120	22 x 35	0.72	1.01	1.520	0.684	**ECOS2SB121BA**	**ECEC2SB121BA**
	25 x 30	0.72	1.01	1.520	0.684	**ECOS2SB121CA**	**ECEC2SB121CA**
150	22 x 40	0.79	1.11	1.216	0.547	**ECOS2SB151BA**	**ECEC2SB151BA**
	25 x 30	0.79	1.11	1.216	0.547	**ECOS2SB151CA**	**ECEC2SB151CA**
	30 x 25	0.79	1.11	1.216	0.547	**ECOS2SB151DA**	**ECEC2SB151DA**
180	22 x 45	0.87	1.22	1.013	0.456	**ECOS2SB181BA**	**ECEC2SB181BA**
	25 x 40	0.87	1.22	1.013	0.456	**ECOS2SB181CA**	**ECEC2SB181CA**
	30 x 30	0.87	1.22	1.013	0.456	**ECOS2SB181DA**	**ECEC2SB181DA**
220	25 x 45	1.00	1.40	0.829	0.373	**ECOS2SB221CA**	**ECEC2SB221CA**
	30 x 30	1.00	1.40	0.829	0.373	**ECOS2SB221DA**	**ECEC2SB221DA**
	35 x 25	1.00	1.40	0.829	0.373	**ECOS2SB221EA**	**ECEC2SB221EA**
270	25 x 50	1.19	1.67	0.675	0.304	**ECOS2SB271CA**	**ECEC2SB271CA**
	30 x 40	1.19	1.67	0.675	0.304	**ECOS2SB271DA**	**ECEC2SB271DA**
	35 x 30	1.19	1.67	0.675	0.304	**ECOS2SB271EA**	**ECEC2SB271EA**
330	30 x 45	1.38	1.93	0.553	0.249	**ECOS2SB331DA**	**ECEC2SB331DA**
	35 x 35	1.38	1.93	0.553	0.249	**ECOS2SB331EA**	**ECEC2SB331EA**
390	30 x 50	1.55	2.17	0.468	0.210	**ECOS2SB391DA**	**ECEC2SB391DA**
	35 x 40	1.55	2.17	0.468	0.210	**ECOS2SB391EA**	**ECEC2SB391EA**
470	35 x 45	1.74	2.44	0.388	0.175	**ECOS2SB471EA**	**ECEC2SB471EA**
560	35 x 50	1.90	2.66	0.326	0.147	**ECOS2SB561EA**	**ECEC2SB561EA**
450 VDC Working, 500 VDC Surge							
82	22 x 30	0.56	0.78	2.022	0.708	**ECOS2WB820BA**	**ECEC2WB820BA**
	25 x 25	0.56	0.78	2.022	0.708	**ECOS2WB820CA**	**ECEC2WB820CA**
100	22 x 35	0.64	0.90	1.658	0.580	**ECOS2WB101BA**	**ECEC2WB101BA**
	25 x 30	0.64	0.90	1.658	0.580	**ECOS2WB101CA**	**ECEC2WB101CA**
120	22 x 40	0.72	1.01	1.382	0.484	**ECOS2WB121BA**	**ECEC2WB121BA**
	25 x 35	0.72	1.01	1.382	0.484	**ECOS2WB121CA**	**ECEC2WB121CA**
	30 x 25	0.72	1.01	1.382	0.484	**ECOS2WB121DA**	**ECEC2WB121DA**
150	22 x 50	0.79	1.11	1.105	0.387	**ECOS2WB151BA**	**ECEC2WB151BA**
	25 x 40	0.79	1.11	1.105	0.387	**ECOS2WB151CA**	**ECEC2WB151CA**
	30 x 30	0.79	1.11	1.105	0.387	**ECOS2WB151DA**	**ECEC2WB151DA**
	35 x 25	0.79	1.11	1.105	0.387	**ECOS2WB151EA**	**ECEC2WB151EA**
180	25 x 45	0.87	1.22	0.921	0.322	**ECOS2WB181CA**	**ECEC2WB181CA**
	30 x 35	0.87	1.22	0.921	0.322	**ECOS2WB181DA**	**ECEC2WB181DA**
220	25 x 50	1.00	1.40	0.754	0.264	**ECOS2WB221CA**	**ECEC2WB221CA**
	30 x 40	1.00	1.40	0.754	0.264	**ECOS2WB221DA**	**ECEC2WB221DA**
	35 x 30	1.00	1.40	0.754	0.264	**ECOS2WB221EA**	**ECEC2WB221EA**
270	30 x 45	1.19	1.67	0.614	0.215	**ECOS2WB271DA**	**ECEC2WB271DA**
	35 x 35	1.19	1.67	0.614	0.215	**ECOS2WB271EA**	**ECEC2WB271EA**
330	30 x 50	1.38	1.93	0.502	0.176	**ECOS2WB331DA**	**ECEC2WB331DA**
	35 x 40	1.38	1.93	0.502	0.176	**ECOS2WB331EA**	**ECEC2WB331EA**
390	35 x 45	1.55	2.17	0.425	0.149	**ECOS2WB391EA**	**ECEC2WB391EA**
470	35 x 50	1.74	2.44	0.353	0.123	**ECOS2WB471EA**	**ECEC2WB471EA**