

Panasonic

Industrial Company



ALUMINUM ELECTROLYTIC CAPACITORS

LARGE CAN SCREW TERMINAL & SNAP-IN

Panasonic ideas for life

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS



Panasonic Electronic Devices Corporation of America has been manufacturing aluminum electrolytic capacitors since 1982.

The Knoxville, Tennessee manufacturing plant initially produced the popular 2 pin, snap-in capacitor. Manufacturing has expanded with a full range of "large can" capacitors

Product features in this catalog include:

- **Higher capacitance series (TS-UQ & TS-HC)**
- **Higher ripple current capacitor series (TS-ED & TS-EE)**
- **3 Pin, keyed polarity option**
- **Extended CV ratings for many series**
- **RoHS compliant product will have boxes marked according to JEITA ETR-7021**

No Pb on the box label indicates RoHS compliance

Contact the factory for more information

Special designs and more comprehensive technical information are available upon request. Contact your Panasonic sales representative for details.

The information contained herein is believed to be accurate at the time of publication. Design and specifications are subject to change without notice.

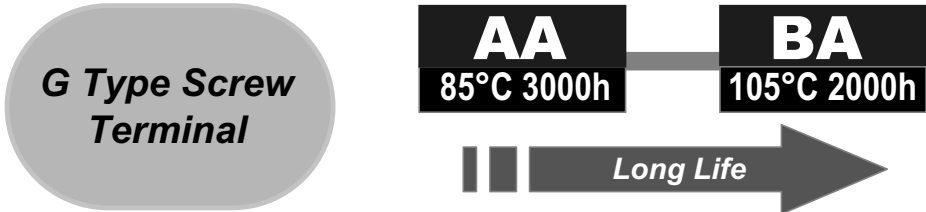
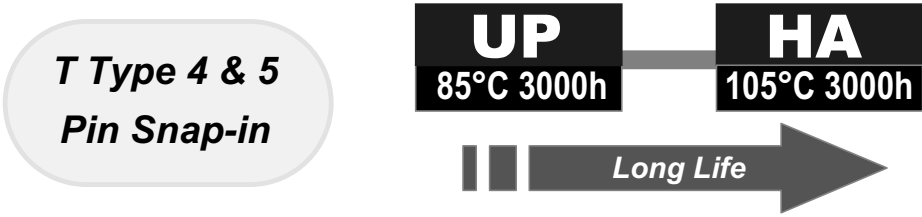
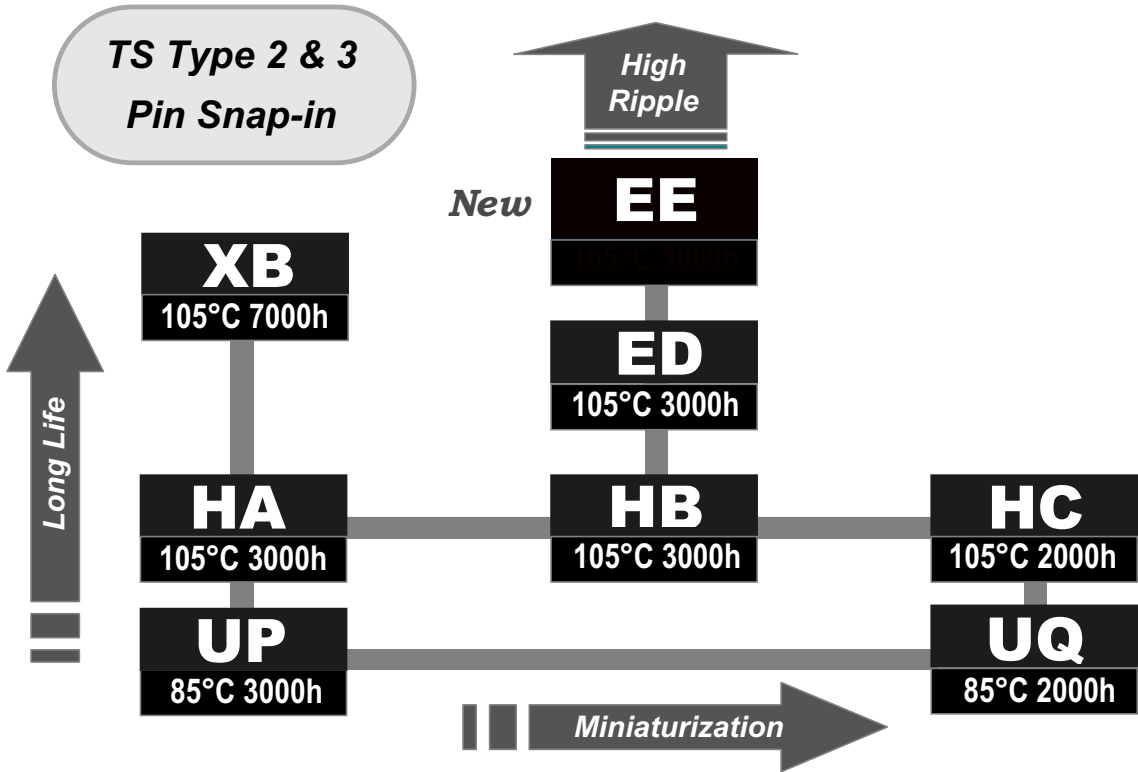
No ozone depleting substances (ODS) under the Montreal Protocol are used in the manufacturing process for these products.

Panasonic Electronic Devices Corporation of America is ISO 9001- 2000 and ISO 14001 registered.

Series	Endurance (Load Life)	Voltage Range (WV)	Cap. Range (μ F)	Size Range D x L (mm)	Features	Page
Capacitor Series Comparison						4
Application Guidelines						5
TS Type, 2 & 3 Terminal Snap-in					General Information	9
UQ	85°C 2000h	16 ~ 450	82 ~ 100,000	22 x 25 ~ 35 x 50	Highest CV, general purpose snap-in. 30% smaller than UP series.	10
UP	85°C 2000 ~ 3000h	16 ~ 500	33 ~ 68,000	22 x 20 ~ 35 x 50	Suitable for most general purpose industrial applications. Extended ratings.	16
HC	105°C 2000h	10 ~ 450	100 ~ 100,000	22 x 25 ~ 35 x 50	Highest CV, long life snap-in.	21
HB	105°C 3000h	160 ~ 450	82 ~ 2,700	22 x 25 ~ 35 x 50	Long life with high ripple current capability. Miniaturized ratings (25% smaller than HA series).	28
HA	105°C 2000 ~ 3000h	10 ~ 450	33 ~ 68,000	22 x 20 ~ 35 x 50	Long life with high ripple current capability.	30
ED	105°C 3000h	200 ~ 450	56 ~ 2,200	22 x 25 ~ 35 x 50	Very high ripple current capability for demanding inverter applications.	34
EE	105°C 3000h	200	300 ~ 1,800	22 x 25 ~ 35 x 45	Highest ripple current.	36
XB	105°C 7000h	160 ~ 450	39 ~ 2,200	22 x 25 ~ 35 x 50	Longest life snap-in suitable for elevated ambient temperatures.	37
T Type, 4 & 5 Terminal Snap-in					General Information	39
UP	85°C 3000h	16 ~ 500	470 ~ 120,000	35 x 40 ~ 50 x 105	Suitable for most general purpose industrial applications. Extended ratings.	40
HA	105°C 3000h	16 ~ 450	390 ~ 120,000	35 x 40 ~ 50 x 105	Long life, extended ratings.	43
G Type, Screw Terminal					General Information	46
AA	85°C 3000h	16 ~ 500	150 ~ 1,200,000	35 x 40 ~ 77 x 220	Suitable for most general purpose industrial applications.	47
BA	105°C 2000h	10 ~ 450	220 ~ 1,200,000	35 x 40 ~ 77 x 220	Long life.	51

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

Capacitor Series Comparison



1 General Specifications

Capacitance

Nominal capacitance is specified at a frequency of 120Hz and a temperature of 20°C. Unless specified otherwise, standard capacitance tolerance is $\pm 20\%$ of the nominal value.

Working Voltage

The maximum allowable sum of continuous DC voltage plus peak ripple voltage which can be applied to the capacitor.

Surge Voltage

The maximum transient voltage level allowed for short periods of time without sustaining permanent damage to the capacitor. Values are listed in the standard product ratings.

Leakage Current

Imperfections in the capacitor dielectric allow a small current to flow. This resultant leakage current is specified as a maximum after 5 minutes application of rated voltage at 20°C. See individual series listings for leakage current equations.

ESR (Equivalent Series Resistance)

Equivalent series resistance causes heat generation within the capacitor when AC ripple current flows through the capacitor. Maximum ESR is normally specified at 120Hz, 20°C.

Ripple Current

Ripple current is the rms value of alternating current flowing through a capacitor. This current causes an internal temperature rise due to power losses within the capacitor.

The standard product tables list allowable ripple current limits at specified maximum operating temperatures.

Ripple current multipliers for other temperatures and frequencies are listed in the introductory page for each series.

Endurance Life Test

Endurance life is the minimum time a capacitor can operate under worst case conditions.

Duration: Specified hours of life

Ambient Temp.: Maximum specified operating temperature

Ripple Current: Maximum specified value

Applied Voltage: Rated DC voltage (the sum of the applied DC voltage plus the peak ripple voltage should not exceed rated working voltage)

Post test requirements at +20°C:

Leakage Current: \leq Initial specified value

Cap. change: $\leq \pm 20\%$ of initial measured value

D. F. / E.S.R.: $\leq 200\%$ of initial specified value

Shelf Life Test

Duration: 1000 hours

Ambient Temp.: Maximum specified operating temperature

Applied Voltage: None

Post test requirements at +20°C:

Same as Endurance Test requirements above.

Measurements are to be performed after applying DC working voltage for 30 minutes.

2 Storage Life

Leakage current will increase during extended storage.

Capacitors should be stored in temperatures not to exceed 40°C and protected from direct exposure to sunlight.

Under normal conditions, storage life can exceed 10 years.

It is recommended that the leakage current be checked for conformance to the specified limit if the capacitor has been stored for four years or more.

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2 Storage Life (continued)

Storage may require reforming of the capacitor to reduce leakage current below the specified limit. This can be accomplished by applying rated voltage in series with a 1000Ω resistor for a time period of 30 ~ 60 minutes.

The capacitor is acceptable for use if the capacitor leakage current is within the original specified limit or the capacitor is reformed to within the original specified limit.

Storage in high humidity conditions could cause oxidation of the terminal plating which could adversely affect solderability.

3 Operation Life Expectancy

Panasonic capacitors have a specified life at a maximum temperature and ripple current. Typical life can be considerably longer based on actual life test results performed by the factory. This data can be provided to help the designer estimate expected life. This information is given with a 60% confidence level.

Capacitor life at lower temperatures follows "The Doubling 10°C Rule" where life is doubled for each 10°C reduction in operating temperature. Voltage derating also improves life expectancy and reliability. The following equations are useful for determining the life of a capacitor in the application;

For $WV = 10\sim 100VDC$;

$$L_2 = L_1 \times 2^{\frac{T_1 - (T_2 + \Delta T)}{10}}$$

For $WV = 160\sim 500VDC$;

$$L_2 = L_1 \times 2^{\frac{T_1 - (T_2 + \Delta T)}{10}} \times (V \div WV)^{-6.5}$$

where:

L_1 = Specified life (hours) at maximum operating temperature. Typical life may be substituted (at a 60% confidence level).

L_2 = Expected life (hours) at actual operating temperature.

T_1 = Maximum specified operating temp.

T_2 = Actual ambient temperature (°C).

ΔT = Ripple current temperature rise (°C).

WV = Rated capacitor voltage (160~500V)

V = Applied voltage

NOTE: $WV \geq V \geq 0.9 \times WV$

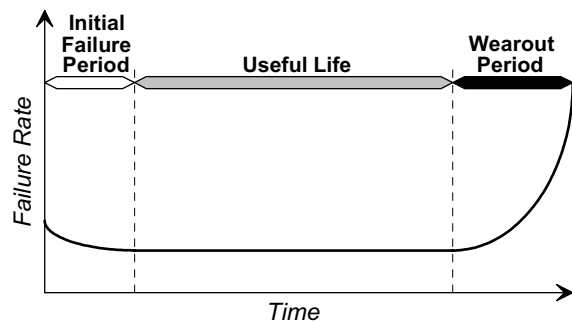
Use of the ripple current temperature multipliers listed for each product series may limit life to the value originally specified for maximum operating temperature.

It is recommended that the ripple current heat rise be limited to 15°C at lower ambient temperatures to accomplish the maximum operating life in the application.

End of life is defined by the occurrence of one of the following;

- ◆ Capacitance change exceeds ±20% of the initial measured value.
- ◆ Dissipation Factor exceeds 200% of the initial specified value.
- ◆ Leakage Current exceeds the initial specified value.

NOTE: Electrical measurements are taken after the capacitor is stabilized at 20°C.



Life Cycle of an Aluminum Electrolytic Capacitor

4 Circuit Design Considerations

Operating Temperature and Frequency

Aluminum electrolytic capacitor electrical characteristics are normally specified at a temperature of 20°C and a frequency of 120Hz.

4 Circuit Design Considerations (continued)

Electrical parameters are temperature and frequency dependent as follows;

(1) Effects of operating temperature

At higher temperatures, capacitance and leakage current increase while ESR decreases.

At lower temperatures, capacitance and leakage current will decrease while ESR increases.

(2) Effects of frequency

Capacitance, impedance, and ESR will decrease as frequency increases.

At lower frequencies, ripple current generated temperature will rise due to increasing ESR.

Reverse Voltage

DC capacitors have polarity which must be verified before insertion.

Avoid use in circuits with changing or uncertain polarity.

Ensure that allowable ripple currents superimposed on DC voltage do not cause reverse voltage conditions.

Charge / Discharge Applications

Standard capacitors are not suitable for use in strobe or photoflash applications.

Contact the factory for low duty cycle applications.

Capacitors Connected in Parallel

Circuit resistance can approximate the series resistance of the capacitor, resulting in ripple current load imbalances. Careful design of wiring methods can minimize excessive ripple currents applied to a capacitor.

Capacitors Connected in Series

Normal DC leakage current variations among capacitors can cause voltage differences. The

use of voltage dividing sharing resistors with consideration to leakage currents can compensate for voltage imbalances.

Electrical Precautions

Transient recovery voltage may be generated in the capacitor due to dielectric absorption. Typical voltage levels are less than 10% of the rated capacitor voltage. If required, this voltage can be discharged with a resistor.

The aluminum case of the capacitor has an indeterminate resistance to the cathode terminal. The vinyl sleeve on the capacitor is for marking and identification purposes and is not meant to electrically isolate the capacitor.

When designing circuits, consider worst case capacitor failure modes such as open or short circuits.

The effects of hot, electrically conductive, combustible, electrolyte liquid or vapor escaping from the safety vent should also be considered.

5 Capacitor Mounting Considerations

Circuit Board Design

Avoid wiring pattern runs which pass between the mounted capacitor and the circuit board. When dipping into a solder bath, excessive solder may collect under the capacitor by capillary action and short circuit the anode and cathode terminals.

The vinyl sleeve of the capacitor can be damaged if solder passes through a lead hole for subsequently processed parts.

Electrically isolate the extra terminal(s) on 4 and 5 pin products from the anode terminal, cathode terminal, and other circuit paths.

Clearance Requirements

Case mounted pressure relief vents require sufficient clearance to operate properly.

The minimum clearance is diameter dependent as follows:

22~35mm diameters: 3mm minimum.

≥40mm diameters: 5mm minimum.

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5 Capacitor Mounting Considerations (continued)

Circuit Board Cleaning

Aluminum electrolytic capacitors can withstand immersion or ultrasonic cleaning with "safe" cleaning solvents for up to 5 minutes and 60°C maximum temperatures.

Most aqueous based cleaning solvents and detergents are acceptable. Some solvent groups could damage capacitors as follows:

- ♦ Halogenated cleaning solvents may permeate the capacitor seal, causing internal corrosion and failure.
- ♦ Alkali solvents may attack and dissolve the aluminum case.
- ♦ Petroleum based solvents may deteriorate the rubber seal.
- ♦ Xylene may deteriorate the rubber seal.
- ♦ Acetone may remove vinyl sleeve ink printing.

A thorough rinsing and drying process will prevent entrapment of residual solvents between the capacitor and the circuit board and the capacitor and the sleeve. Excessive drying temperatures and / or radiant heat drying sources may result in splitting or excessive shrinkage of the vinyl sleeve.

Mounting Adhesives and Coating Agents

When using mounting adhesives or coating agents, avoid materials with halogenated cleaning solvents including chloroprene based polymers.

A thorough adhesive or coating drying process is required to prevent solvent entrapment between the capacitor and the circuit board.

Mounting adhesives or reinforcement clamps are recommended on TS types with case sizes of $\phi 35 \times 45\text{mm}$ or larger. Additional mounting support is also recommended for T types with lengths exceeding 63mm.

6 Safety Precautions

If the pressure relief vent of the capacitor should operate, immediately turn off the equipment and disconnect from the power source. This will minimize additional damage caused by the vaporizing electrolyte.

Avoid contact with the escaping electrolyte which can exceed 100°C temperatures.

If electrolyte or vapors enter the eye, immediately flush the eye with large amounts of water and seek medical attention.

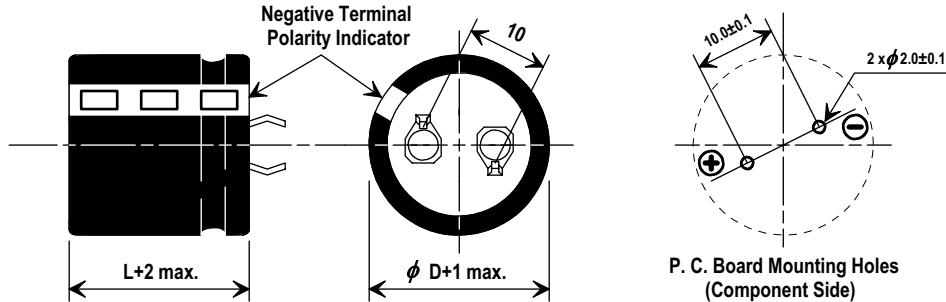
If electrolytes or vapors are ingested by mouth, gargle with water.

If electrolyte contacts the skin, wash with soap and water.

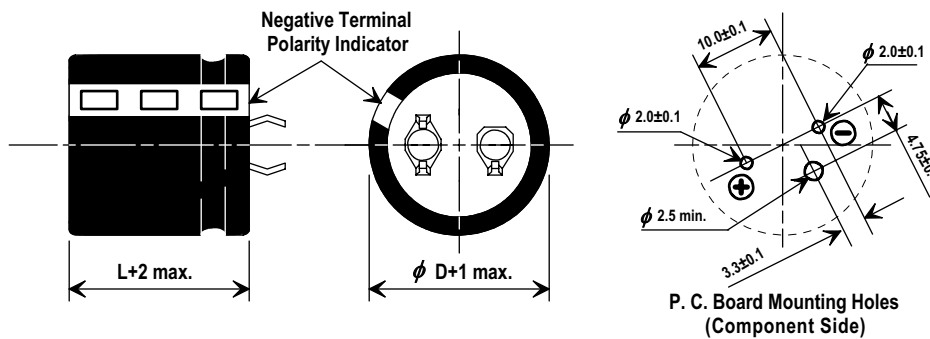
TS Type General Information

Dimensions

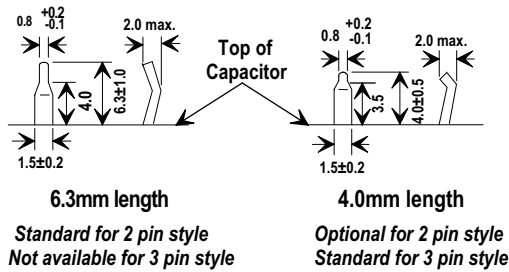
2 Pin Style



3 Pin Style



Terminal Dimensions



Standard Packaging Quantities

Diameter	Length	Box Quantity
22mm	20~50mm	200
25mm	20~50mm	200
30mm	20~50mm	200
35mm	20~50mm	100
35mm	>50mm	50

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-UQ Series 85°C, 2000 hours

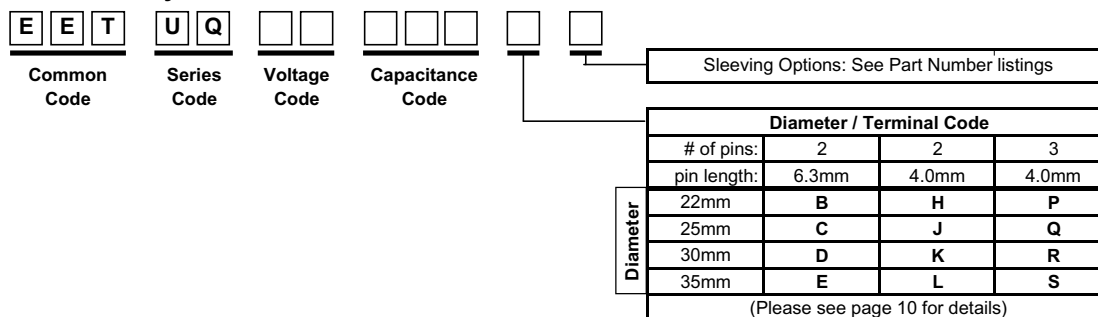
- Highly miniaturized version (30% smaller than UP series)
- 2 and 3 pin versions available
- PET Sleeve Option



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 450 VDC										
Operating Temperature:	-40 ~ +85°C	-25 ~ +85°C										
Nominal Capacitance:	270 ~ 100000µF	82 ~ 1000µF										
Capacitance Tolerance:	± 20%											
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:	16	25	35	50	63	80	100	160 ~ 450			
	Max. D.F. (%):	50	40	35	30	25	20	20	15			
	For capacitance values > 33000µF, add the value of: $\frac{\text{(rated cap. } [\mu\text{F}] - 33000)}{1000}$											
Leakage Current:	$3\sqrt{CV}$ (µA) max. after 5 minutes; C = Capacitance in µF, V = WV											
Ripple Current Multipliers:	Frequency(Hz):	50	60	100~120	500	1k	10k	Ripple Current Ambient Temperature Factors*				
	16~100WV:	0.93	0.95	1.0	1.05	1.08	1.15	Temperature (°C):	85°C	70°C	60°C	≤45°C
	160~450WV:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier:	1.0	1.3	1.4	1.5
Endurance:	2000 hours at +85°C with maximum specified ripple current (see page 6)											

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

Part Number System



TS-UQ Standard Ratings (part numbers shown with 2 pins and 6.3mm length terminal)

Cap. (µF)	Size (mm) D x L	Max 85°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number	Part Number Suffix Sleaving Options		
		120Hz	10kHz~	120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
16 VDC Working, 20 VDC Surge									
12000	22 x 25	4.52	5.20	0.069	0.059	EETUQ1C123B_	A	(No suffix)	J
15000	22 x 30	5.26	6.05	0.055	0.047	EETUQ1C153B_	A	(No suffix)	J
18000	22 x 35	5.57	6.41	0.046	0.039	EETUQ1C183B_	A	(No suffix)	J
	25 x 25	5.57	6.41	0.046	0.039	EETUQ1C183C_	A	(No suffix)	J
22000	22 x 40	6.10	7.02	0.038	0.032	EETUQ1C223B_	A	(No suffix)	J
	25 x 30	6.10	7.02	0.038	0.032	EETUQ1C223C_	A	(No suffix)	J
27000	22 x 45	6.31	7.26	0.031	0.026	EETUQ1C273B_	A	(No suffix)	J
	25 x 35	6.31	7.26	0.031	0.026	EETUQ1C273C_	A	(No suffix)	J
	30 x 25	6.31	7.26	0.031	0.026	EETUQ1C273D_	A	(No suffix)	J
33000	22 x 50	6.84	7.87	0.025	0.021	EETUQ1C333B_	A	(No suffix)	J
	25 x 40	6.84	7.87	0.025	0.021	EETUQ1C333C_	A	(No suffix)	J
	30 x 30	6.84	7.87	0.025	0.021	EETUQ1C333D_	A	(No suffix)	J
	35 x 25	6.84	7.87	0.025	0.021	EETUQ1C333E_	A	(No suffix)	J
39000	25 x 45	6.94	7.98	0.024	0.020	EETUQ1C393C_	A	(No suffix)	J
	30 x 35	6.94	7.98	0.024	0.020	EETUQ1C393D_	A	(No suffix)	J
47000	25 x 50	7.47	8.59	0.023	0.019	EETUQ1C473C_	A	(No suffix)	J
	30 x 40	7.47	8.59	0.023	0.019	EETUQ1C473D_	A	(No suffix)	J
	35 x 30	7.47	8.59	0.023	0.019	EETUQ1C473E_	A	(No suffix)	J
56000	30 x 45	8.73	10.04	0.022	0.019	EETUQ1C563D_	A	(No suffix)	J
	35 x 35	8.73	10.04	0.022	0.018	EETUQ1C563E_	A	(No suffix)	J
68000	30 x 50	9.05	10.41	0.021	0.018	EETUQ1C683D_	A	(No suffix)	J
	35 x 40	9.05	10.41	0.021	0.018	EETUQ1C683E_	A	(No suffix)	J
82000	35 x 45	9.49	10.91	0.020	0.018	EETUQ1C823E_	A	(No suffix)	J
100000	35 x 50	10.18	11.71	0.019	0.018	EETUQ1C104E_	A	(No suffix)	J

TS-UQ Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 85°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
25 VDC Working, 32 VDC Surge											
8200	22 x 25	3.57	4.11	0.081	0.065	EETUQ1E822B_	A	(No suffix)	J		
12000	22 x 30	4.10	4.72	0.055	0.044	EETUQ1E123B_	A	(No suffix)	J		
	25 x 25	4.10	4.72	0.055	0.044	EETUQ1E123C_	A	(No suffix)	J		
15000	22 x 35	4.63	5.32	0.044	0.035	EETUQ1E153B_	A	(No suffix)	J		
	25 x 30	4.63	5.32	0.044	0.035	EETUQ1E153C_	A	(No suffix)	J		
18000	22 x 40	5.47	6.29	0.037	0.029	EETUQ1E183B_	A	(No suffix)	J		
	25 x 35	5.47	6.29	0.037	0.029	EETUQ1E183C_	A	(No suffix)	J		
	30 x 25	5.47	6.29	0.037	0.029	EETUQ1E183D_	A	(No suffix)	J		
22000	22 x 45	6.10	7.02	0.030	0.024	EETUQ1E223B_	A	(No suffix)	J		
	25 x 40	6.10	7.02	0.030	0.024	EETUQ1E223C_	A	(No suffix)	J		
	30 x 30	6.10	7.02	0.030	0.024	EETUQ1E223D_	A	(No suffix)	J		
	35 x 25	6.10	7.02	0.030	0.024	EETUQ1E223E_	A	(No suffix)	J		
27000	25 x 45	6.21	7.14	0.025	0.020	EETUQ1E273C_	A	(No suffix)	J		
	30 x 35	6.21	7.14	0.025	0.020	EETUQ1E273D_	A	(No suffix)	J		
33000	25 x 50	6.84	7.87	0.020	0.016	EETUQ1E333C_	A	(No suffix)	J		
	30 x 40	6.84	7.87	0.020	0.016	EETUQ1E333D_	A	(No suffix)	J		
	35 x 30	6.84	7.87	0.020	0.016	EETUQ1E333E_	A	(No suffix)	J		
39000	30 x 45	7.36	8.46	0.020	0.016	EETUQ1E393D_	A	(No suffix)	J		
	35 x 35	7.36	8.46	0.020	0.016	EETUQ1E393E_	A	(No suffix)	J		
47000	30 x 50	8.00	9.20	0.019	0.016	EETUQ1E473D_	A	(No suffix)	J		
	35 x 40	8.00	9.20	0.019	0.015	EETUQ1E473E_	A	(No suffix)	J		
56000	35 x 45	8.91	10.25	0.019	0.016	EETUQ1E563E_	A	(No suffix)	J		
68000	35 x 50	9.79	11.26	0.018	0.016	EETUQ1E683E_	A	(No suffix)	J		
35 VDC Working, 44 VDC Surge											
5600	22 x 25	3.36	3.86	0.104	0.078	EETUQ1V562B_	A	(No suffix)	J		
8200	22 x 30	4.00	4.60	0.071	0.053	EETUQ1V822B_	A	(No suffix)	J		
	25 x 25	4.00	4.60	0.071	0.053	EETUQ1V822C_	A	(No suffix)	J		
10000	22 x 35	4.42	5.08	0.058	0.044	EETUQ1V103B_	A	(No suffix)	J		
	25 x 30	4.42	5.08	0.058	0.044	EETUQ1V103C_	A	(No suffix)	J		
12000	22 x 40	5.05	5.81	0.048	0.036	EETUQ1V123B_	A	(No suffix)	J		
	25 x 35	5.05	5.81	0.048	0.036	EETUQ1V123C_	A	(No suffix)	J		
	30 x 25	5.05	5.81	0.048	0.036	EETUQ1V123D_	A	(No suffix)	J		
15000	22 x 45	5.57	6.41	0.039	0.029	EETUQ1V153B_	A	(No suffix)	J		
	25 x 40	5.57	6.41	0.039	0.029	EETUQ1V153C_	A	(No suffix)	J		
18000	25 x 45	5.68	6.53	0.032	0.024	EETUQ1V183C_	A	(No suffix)	J		
	30 x 30	5.68	6.53	0.032	0.024	EETUQ1V183D_	A	(No suffix)	J		
	35 x 25	5.68	6.53	0.032	0.024	EETUQ1V183E_	A	(No suffix)	J		
22000	25 x 50	6.10	7.02	0.026	0.020	EETUQ1V223C_	A	(No suffix)	J		
	30 x 35	6.10	7.02	0.026	0.020	EETUQ1V223D_	A	(No suffix)	J		
	35 x 30	6.10	7.02	0.026	0.020	EETUQ1V223E_	A	(No suffix)	J		
27000	30 x 45	6.84	7.87	0.021	0.016	EETUQ1V273D_	A	(No suffix)	J		
	35 x 35	6.84	7.87	0.021	0.016	EETUQ1V273E_	A	(No suffix)	J		
33000	30 x 50	7.15	8.22	0.018	0.013	EETUQ1V333D_	A	(No suffix)	J		
	35 x 40	7.15	8.22	0.018	0.014	EETUQ1V333E_	A	(No suffix)	J		
39000	35 x 45	7.91	9.10	0.017	0.014	EETUQ1V393E_	A	(No suffix)	J		
47000	35 x 50	8.56	9.84	0.017	0.014	EETUQ1V473E_	A	(No suffix)	J		
50 VDC Working, 63 VDC Surge											
3300	22 x 25	2.73	3.14	0.151	0.113	EETUQ1H332B_	A	(No suffix)	J		
4700	22 x 30	3.03	3.48	0.106	0.079	EETUQ1H472B_	A	(No suffix)	J		
	25 x 25	3.03	3.48	0.106	0.079	EETUQ1H472C_	A	(No suffix)	J		
5600	22 x 35	3.42	3.93	0.089	0.067	EETUQ1H562B_	A	(No suffix)	J		
6800	22 x 40	3.85	4.43	0.073	0.055	EETUQ1H682B_	A	(No suffix)	J		
	25 x 30	3.85	4.43	0.073	0.055	EETUQ1H682C_	A	(No suffix)	J		
	30 x 25	3.85	4.43	0.073	0.055	EETUQ1H682D_	A	(No suffix)	J		
8200	22 x 45	4.41	5.07	0.061	0.045	EETUQ1H822B_	A	(No suffix)	J		
	25 x 35	4.41	5.07	0.061	0.045	EETUQ1H822C_	A	(No suffix)	J		
10000	22 x 50	4.97	5.72	0.050	0.037	EETUQ1H103B_	A	(No suffix)	J		
	25 x 40	4.97	5.72	0.050	0.037	EETUQ1H103C_	A	(No suffix)	J		
	30 x 30	4.97	5.72	0.050	0.037	EETUQ1H103D_	A	(No suffix)	J		
	35 x 25	4.97	5.72	0.050	0.037	EETUQ1H103E_	A	(No suffix)	J		
12000	25 x 45	5.58	6.42	0.041	0.031	EETUQ1H123C_	A	(No suffix)	J		
	30 x 35	5.58	6.42	0.041	0.031	EETUQ1H123D_	A	(No suffix)	J		
	35 x 30	5.58	6.42	0.041	0.031	EETUQ1H123E_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-UQ Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 85°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
50 VDC Working, 63 VDC Surge (continued)											
15000	30 x 40	6.44	7.41	0.033	0.025	EETUQ1H153D_	A	(No suffix)	J		
	35 x 35	6.44	7.41	0.033	0.025	EETUQ1H153E_	A	(No suffix)	J		
18000	30 x 45	6.94	7.98	0.028	0.021	EETUQ1H183D_	A	(No suffix)	J		
	35 x 40	6.94	7.98	0.028	0.021	EETUQ1H183E_	A	(No suffix)	J		
22000	35 x 45	7.57	8.71	0.023	0.018	EETUQ1H223E_	A	(No suffix)	J		
27000	35 x 50	8.96	10.30	0.018	0.015	EETUQ1H273E_	A	(No suffix)	J		
63 VDC Working, 79 VDC Surge											
2200	22 x 25	2.52	2.90	0.188	0.141	EETUQ1J222B_	A	(No suffix)	J		
3300	22 x 30	4.10	4.72	0.126	0.094	EETUQ1J332B_	A	(No suffix)	J		
	25 x 25	4.10	4.72	0.126	0.094	EETUQ1J332C_	A	(No suffix)	J		
3900	22 x 35	4.44	5.11	0.106	0.080	EETUQ1J392B_	A	(No suffix)	J		
	25 x 30	4.44	5.11	0.106	0.080	EETUQ1J392C_	A	(No suffix)	J		
4700	22 x 40	4.86	5.59	0.088	0.066	EETUQ1J472B_	A	(No suffix)	J		
	25 x 35	4.86	5.59	0.088	0.066	EETUQ1J472C_	A	(No suffix)	J		
	30 x 25	4.86	5.59	0.088	0.066	EETUQ1J472D_	A	(No suffix)	J		
5600	22 x 45	5.36	6.16	0.074	0.056	EETUQ1J562B_	A	(No suffix)	J		
	25 x 40	5.36	6.16	0.074	0.056	EETUQ1J562C_	A	(No suffix)	J		
6800	25 x 45	5.84	6.72	0.061	0.046	EETUQ1J682C_	A	(No suffix)	J		
	30 x 30	5.84	6.72	0.061	0.046	EETUQ1J682D_	A	(No suffix)	J		
	35 x 25	5.84	6.72	0.061	0.046	EETUQ1J682E_	A	(No suffix)	J		
8200	25 x 50	6.00	6.90	0.051	0.038	EETUQ1J822C_	A	(No suffix)	J		
	30 x 35	6.00	6.90	0.051	0.038	EETUQ1J822D_	A	(No suffix)	J		
	35 x 30	6.00	6.90	0.051	0.038	EETUQ1J822E_	A	(No suffix)	J		
10000	30 x 40	6.52	7.50	0.041	0.031	EETUQ1J103D_	A	(No suffix)	J		
	35 x 35	6.52	7.50	0.041	0.031	EETUQ1J103E_	A	(No suffix)	J		
12000	30 x 45	7.15	8.22	0.035	0.026	EETUQ1J123D_	A	(No suffix)	J		
	35 x 40	7.15	8.22	0.035	0.026	EETUQ1J123E_	A	(No suffix)	J		
15000	35 x 45	7.91	9.10	0.028	0.021	EETUQ1J153E_	A	(No suffix)	J		
18000	35 x 50	8.55	9.83	0.023	0.018	EETUQ1J183E_	A	(No suffix)	J		
80 VDC Working, 100 VDC Surge											
1500	22 x 25	2.26	2.60	0.221	0.166	EETUQ1K152B_	A	(No suffix)	J		
1800	22 x 30	2.52	2.90	0.184	0.138	EETUQ1K182B_	A	(No suffix)	J		
2200	22 x 35	2.73	3.14	0.151	0.113	EETUQ1K222B_	A	(No suffix)	J		
	25 x 25	2.73	3.14	0.151	0.113	EETUQ1K222C_	A	(No suffix)	J		
2700	22 x 40	2.78	3.20	0.123	0.092	EETUQ1K272B_	A	(No suffix)	J		
	25 x 30	2.78	3.20	0.123	0.092	EETUQ1K272C_	A	(No suffix)	J		
3300	22 x 45	3.21	3.69	0.100	0.075	EETUQ1K332B_	A	(No suffix)	J		
	25 x 35	3.21	3.69	0.100	0.075	EETUQ1K332C_	A	(No suffix)	J		
	30 x 25	3.21	3.69	0.100	0.075	EETUQ1K332D_	A	(No suffix)	J		
3900	22 x 50	3.59	4.13	0.085	0.064	EETUQ1K392B_	A	(No suffix)	J		
	25 x 40	3.59	4.13	0.085	0.064	EETUQ1K392C_	A	(No suffix)	J		
	35 x 25	3.59	4.13	0.085	0.064	EETUQ1K392E_	A	(No suffix)	J		
4700	25 x 45	4.09	4.70	0.071	0.053	EETUQ1K472C_	A	(No suffix)	J		
	30 x 30	4.09	4.70	0.071	0.053	EETUQ1K472D_	A	(No suffix)	J		
5600	25 x 50	4.55	5.23	0.059	0.044	EETUQ1K562C_	A	(No suffix)	J		
	30 x 35	4.55	5.23	0.059	0.044	EETUQ1K562D_	A	(No suffix)	J		
	35 x 30	4.55	5.23	0.059	0.044	EETUQ1K562E_	A	(No suffix)	J		
6800	30 x 45	5.16	5.93	0.049	0.037	EETUQ1K682D_	A	(No suffix)	J		
	35 x 35	5.16	5.93	0.049	0.037	EETUQ1K682E_	A	(No suffix)	J		
8200	30 x 50	5.83	6.70	0.040	0.030	EETUQ1K822D_	A	(No suffix)	J		
	35 x 40	5.83	6.70	0.040	0.030	EETUQ1K822E_	A	(No suffix)	J		
10000	35 x 45	6.51	7.49	0.033	0.025	EETUQ1K103E_	A	(No suffix)	J		
12000	35 x 50	7.28	8.37	0.028	0.021	EETUQ1K123E_	A	(No suffix)	J		
100 VDC Working, 125 VDC Surge											
1000	22 x 25	1.96	2.25	0.332	0.216	EETUQ2A102B_	A	(No suffix)	J		
1200	25 x 25	2.31	2.66	0.276	0.180	EETUQ2A122C_	A	(No suffix)	J		
1500	22 x 30	2.57	2.96	0.221	0.144	EETUQ2A152B_	A	(No suffix)	J		
1800	22 x 35	2.84	3.27	0.184	0.120	EETUQ2A182B_	A	(No suffix)	J		
	25 x 30	2.84	3.27	0.184	0.120	EETUQ2A182C_	A	(No suffix)	J		
2200	22 x 45	3.14	3.61	0.151	0.098	EETUQ2A222B_	A	(No suffix)	J		
	25 x 35	3.14	3.61	0.151	0.098	EETUQ2A222C_	A	(No suffix)	J		
	30 x 25	3.14	3.61	0.151	0.098	EETUQ2A222D_	A	(No suffix)	J		

TS-UQ Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 85°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
100 VDC Working, 125 VDC Surge (continued)											
2700	22 x 50	3.71	4.27	0.123	0.080	EETUQ2A272B_	A	(No suffix)	J		
	25 x 40	3.71	4.27	0.123	0.080	EETUQ2A272C_	A	(No suffix)	J		
	30 x 30	3.71	4.27	0.123	0.080	EETUQ2A272D_	A	(No suffix)	J		
	35 x 25	3.71	4.27	0.123	0.080	EETUQ2A272E_	A	(No suffix)	J		
3300	25 x 45	4.06	4.67	0.100	0.065	EETUQ2A332C_	A	(No suffix)	J		
	30 x 35	4.06	4.67	0.100	0.065	EETUQ2A332D_	A	(No suffix)	J		
3900	25 x 50	4.54	5.22	0.085	0.055	EETUQ2A392C_	A	(No suffix)	J		
	30 x 40	4.54	5.22	0.085	0.055	EETUQ2A392D_	A	(No suffix)	J		
	35 x 30	4.54	5.22	0.085	0.055	EETUQ2A392E_	A	(No suffix)	J		
4700	30 x 45	5.13	5.90	0.071	0.046	EETUQ2A472D_	A	(No suffix)	J		
	35 x 35	5.13	5.90	0.071	0.046	EETUQ2A472E_	A	(No suffix)	J		
5600	30 x 50	5.75	6.61	0.059	0.041	EETUQ2A562D_	A	(No suffix)	J		
	35 x 40	5.75	6.61	0.059	0.038	EETUQ2A562E_	A	(No suffix)	J		
6800	35 x 45	6.60	7.59	0.049	0.034	EETUQ2A682E_	A	(No suffix)	J		
8200	35 x 50	7.29	8.38	0.040	0.030	EETUQ2A822E_	A	(No suffix)	J		
160 VDC Working, 200 VDC Surge											
560	22 x 25	2.25	3.15	0.355	0.160	EETUQ2C561B_	A	(No suffix)	J		
680	22 x 30	2.50	3.50	0.293	0.132	EETUQ2C681B_	A	(No suffix)	J		
820	22 x 35	2.75	3.85	0.243	0.109	EETUQ2C821B_	A	(No suffix)	J		
1000	22 x 40	3.00	4.20	0.199	0.090	EETUQ2C102B_	A	(No suffix)	J		
	25 x 30	3.00	4.20	0.199	0.090	EETUQ2C102C_	A	(No suffix)	J		
1200	22 x 45	3.25	4.55	0.166	0.075	EETUQ2C122B_	A	(No suffix)	J		
	25 x 35	3.25	4.55	0.166	0.075	EETUQ2C122C_	A	(No suffix)	J		
	30 x 25	3.25	4.55	0.166	0.075	EETUQ2C122D_	A	(No suffix)	J		
1500	22 x 50	3.73	5.22	0.133	0.060	EETUQ2C152B_	A	(No suffix)	J		
	25 x 40	3.73	5.22	0.133	0.060	EETUQ2C152C_	A	(No suffix)	J		
	30 x 30	3.73	5.22	0.133	0.060	EETUQ2C152D_	A	(No suffix)	J		
	35 x 25	3.73	5.22	0.133	0.060	EETUQ2C152E_	A	(No suffix)	J		
1800	25 x 45	4.20	5.88	0.111	0.050	EETUQ2C182C_	A	(No suffix)	J		
	30 x 35	4.20	5.88	0.120	0.060	EETUQ2C182D_	A	(No suffix)	J		
	35 x 30	4.20	5.88	0.111	0.050	EETUQ2C182E_	A	(No suffix)	J		
2200	30 x 40	4.78	6.69	0.090	0.041	EETUQ2C222D_	A	(No suffix)	J		
	35 x 35	4.78	6.69	0.098	0.049	EETUQ2C222E_	A	(No suffix)	J		
2700	30 x 45	5.45	7.63	0.074	0.033	EETUQ2C272D_	A	(No suffix)	J		
	35 x 40	5.45	7.63	0.080	0.040	EETUQ2C272E_	A	(No suffix)	J		
3300	35 x 45	5.75	8.05	0.070	0.035	EETUQ2C332E_	A	(No suffix)	J		
3900	35 x 50	6.00	8.40	0.055	0.028	EETUQ2C392E_	A	(No suffix)	J		
200 VDC Working, 250 VDC Surge											
390	22 x 25	1.68	2.35	0.510	0.230	EETUQ2D391B_	A	(No suffix)	J		
470	22 x 30	1.85	2.59	0.423	0.190	EETUQ2D471B_	A	(No suffix)	J		
560	22 x 30	2.43	3.40	0.355	0.160	EETUQ2D561B_	A	(No suffix)	J		
	25 x 25	2.43	3.40	0.355	0.160	EETUQ2D561C_	A	(No suffix)	J		
680	22 x 35	2.68	3.75	0.293	0.132	EETUQ2D681B_	A	(No suffix)	J		
	25 x 30	2.68	3.75	0.293	0.132	EETUQ2D681C_	A	(No suffix)	J		
820	22 x 40	2.93	4.10	0.243	0.109	EETUQ2D821B_	A	(No suffix)	J		
	25 x 30	2.93	4.10	0.243	0.109	EETUQ2D821C_	A	(No suffix)	J		
	30 x 25	2.93	4.10	0.243	0.109	EETUQ2D821D_	A	(No suffix)	J		
1000	22 x 45	3.25	4.55	0.199	0.090	EETUQ2D102B_	A	(No suffix)	J		
	25 x 35	3.25	4.55	0.199	0.090	EETUQ2D102C_	A	(No suffix)	J		
	30 x 30	3.25	4.55	0.199	0.090	EETUQ2D102D_	A	(No suffix)	J		
	35 x 25	3.25	4.55	0.232	0.116	EETUQ2D102E_	A	(No suffix)	J		
1200	22 x 50	3.50	4.90	0.166	0.075	EETUQ2D122B_	A	(No suffix)	J		
	25 x 40	3.50	4.90	0.166	0.075	EETUQ2D122C_	A	(No suffix)	J		
	30 x 30	3.50	4.90	0.166	0.075	EETUQ2D122D_	A	(No suffix)	J		
1500	25 x 50	3.87	5.42	0.133	0.060	EETUQ2D152C_	A	(No suffix)	J		
	30 x 35	3.87	5.42	0.144	0.065	EETUQ2D152D_	A	(No suffix)	J		
	35 x 30	3.87	5.42	0.144	0.065	EETUQ2D152E_	A	(No suffix)	J		
1800	30 x 45	4.32	6.05	0.120	0.060	EETUQ2D182D_	A	(No suffix)	J		
	35 x 35	4.32	6.05	0.120	0.060	EETUQ2D182E_	A	(No suffix)	J		
2200	30 x 50	4.92	6.89	0.098	0.049	EETUQ2D222D_	A	(No suffix)	J		
	35 x 40	4.92	6.89	0.105	0.053	EETUQ2D222E_	A	(No suffix)	J		
2700	35 x 50	5.45	7.63	0.086	0.043	EETUQ2D272E_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-UQ Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 85°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
		120Hz	10kHz~	120Hz	20kHz						
250 VDC Working, 300 VDC Surge											
270	22 x 25	1.31	1.83	0.737	0.332	EETUQ2E271B_	A	(No suffix)	J		
330	22 x 30	1.75	2.45	0.603	0.271	EETUQ2E331B_	A	(No suffix)	J		
390	22 x 30	1.91	2.67	0.510	0.230	EETUQ2E391B_	A	(No suffix)	J		
	25 x 25	1.91	2.67	0.510	0.230	EETUQ2E391C_	A	(No suffix)	J		
470	22 x 35	2.11	2.95	0.423	0.190	EETUQ2E471B_	A	(No suffix)	J		
	25 x 30	2.11	2.95	0.423	0.190	EETUQ2E471C_	A	(No suffix)	J		
560	22 x 40	2.25	3.15	0.355	0.160	EETUQ2E561B_	A	(No suffix)	J		
	25 x 30	2.25	3.15	0.355	0.160	EETUQ2E561C_	A	(No suffix)	J		
	30 x 25	2.25	3.15	0.355	0.160	EETUQ2E561D_	A	(No suffix)	J		
680	22 x 45	2.50	3.50	0.293	0.132	EETUQ2E681B_	A	(No suffix)	J		
	25 x 35	2.50	3.50	0.293	0.132	EETUQ2E681C_	A	(No suffix)	J		
	30 x 25	2.30	3.22	0.293	0.132	EETUQ2E681D_	F	U	C		
	30 x 30	2.50	3.50	0.293	0.132	EETUQ2E681D_	A	(No suffix)	J		
820	22 x 50	2.77	3.88	0.243	0.109	EETUQ2E821B_	A	(No suffix)	J		
	25 x 40	2.77	3.88	0.243	0.109	EETUQ2E821C_	A	(No suffix)	J		
	30 x 30	2.77	3.88	0.243	0.109	EETUQ2E821D_	A	(No suffix)	J		
	35 x 25	2.77	3.88	0.243	0.121	EETUQ2E821E_	A	(No suffix)	J		
1000	25 x 45	3.32	4.65	0.199	0.090	EETUQ2E102C_	A	(No suffix)	J		
	30 x 35	3.32	4.65	0.199	0.090	EETUQ2E102D_	A	(No suffix)	J		
	35 x 30	3.32	4.65	0.199	0.090	EETUQ2E102E_	A	(No suffix)	J		
1200	30 x 40	3.53	4.94	0.166	0.075	EETUQ2E122D_	A	(No suffix)	J		
	35 x 35	3.53	4.94	0.166	0.083	EETUQ2E122E_	A	(No suffix)	J		
1500	30 x 50	4.04	5.66	0.133	0.066	EETUQ2E152D_	A	(No suffix)	J		
	35 x 40	4.04	5.66	0.133	0.066	EETUQ2E152E_	A	(No suffix)	J		
1800	35 x 45	4.55	6.37	0.111	0.055	EETUQ2E182E_	A	(No suffix)	J		
2200	35 x 50	4.75	6.65	0.098	0.049	EETUQ2E222E_	A	(No suffix)	J		
350 VDC Working, 400 VDC Surge											
150	22 x 25	1.12	1.57	1.326	0.663	EETUQ2V151B_	A	(No suffix)	J		
180	22 x 30	1.22	1.71	1.105	0.553	EETUQ2V181B_	A	(No suffix)	J		
220	22 x 35	1.44	2.02	0.904	0.452	EETUQ2V221B_	A	(No suffix)	J		
270	22 x 40	1.66	2.32	0.737	0.368	EETUQ2V271B_	A	(No suffix)	J		
	25 x 30	1.66	2.32	0.737	0.368	EETUQ2V271C_	A	(No suffix)	J		
330	22 x 45	1.88	2.63	0.603	0.301	EETUQ2V331B_	A	(No suffix)	J		
	25 x 35	1.88	2.63	0.603	0.301	EETUQ2V331C_	A	(No suffix)	J		
390	22 x 50	2.06	2.88	0.510	0.255	EETUQ2V391B_	A	(No suffix)	J		
	25 x 40	2.06	2.88	0.510	0.255	EETUQ2V391C_	A	(No suffix)	J		
	30 x 30	2.06	2.88	0.510	0.255	EETUQ2V391D_	A	(No suffix)	J		
	35 x 25	2.06	2.88	0.510	0.255	EETUQ2V391E_	A	(No suffix)	J		
470	25 x 45	2.40	3.36	0.423	0.212	EETUQ2V471C_	A	(No suffix)	J		
	30 x 35	2.40	3.36	0.423	0.212	EETUQ2V471D_	A	(No suffix)	J		
	35 x 30	2.40	3.36	0.423	0.233	EETUQ2V471E_	A	(No suffix)	J		
560	25 x 50	2.60	3.64	0.355	0.178	EETUQ2V561C_	A	(No suffix)	J		
	30 x 40	2.60	3.64	0.355	0.178	EETUQ2V561D_	A	(No suffix)	J		
	35 x 30	2.60	3.64	0.355	0.195	EETUQ2V561E_	A	(No suffix)	J		
680	30 x 45	2.96	4.14	0.293	0.146	EETUQ2V681D_	A	(No suffix)	J		
	35 x 35	2.96	4.14	0.293	0.146	EETUQ2V681E_	A	(No suffix)	J		
820	30 x 50	3.25	4.55	0.243	0.121	EETUQ2V821D_	A	(No suffix)	J		
	35 x 45	3.25	4.55	0.243	0.121	EETUQ2V821E_	A	(No suffix)	J		
1000	35 x 50	3.54	4.96	0.199	0.109	EETUQ2V102E_	A	(No suffix)	J		
400 VDC Working, 450 VDC Surge											
120	22 x 25	1.02	1.43	1.658	0.829	EETUQ2G121B_	A	(No suffix)	J		
150	22 x 30	1.16	1.62	1.326	0.663	EETUQ2G151B_	A	(No suffix)	J		
180	22 x 30	1.30	1.82	1.105	0.553	EETUQ2G181B_	F	U	C		
	22 x 35	1.44	2.02	1.105	0.553	EETUQ2G181B_	A	(No suffix)	J		
220	22 x 35	1.40	1.96	0.904	0.452	EETUQ2G221B_	F	U	C		
	22 x 40	1.49	2.09	0.904	0.452	EETUQ2G221B_	A	(No suffix)	J		
	25 x 30	1.49	2.09	0.904	0.452	EETUQ2G221C_	A	(No suffix)	J		
270	22 x 45	1.67	2.34	0.737	0.368	EETUQ2G271B_	A	(No suffix)	J		
	25 x 35	1.67	2.34	0.737	0.368	EETUQ2G271C_	A	(No suffix)	J		
	30 x 30	1.67	2.34	0.737	0.368	EETUQ2G271D_	A	(No suffix)	J		
330	22 x 50	1.90	2.66	0.603	0.301	EETUQ2G331B_	A	(No suffix)	J		
	25 x 40	1.90	2.66	0.603	0.301	EETUQ2G331C_	A	(No suffix)	J		

TS-UQ Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 85°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
400 VDC Working, 450 VDC Surge (continued)											
330	30 x 30	1.90	2.66	0.603	0.301	EETUQ2G331D_	A	(No suffix)	J		
	35 x 25	1.90	2.66	0.603	0.301	EETUQ2G331E_	A	(No suffix)	J		
390	25 x 45	2.13	2.98	0.510	0.255	EETUQ2G391C_	A	(No suffix)	J		
	30 x 35	2.13	2.98	0.510	0.255	EETUQ2G391D_	A	(No suffix)	J		
	35 x 30	2.13	2.98	0.510	0.255	EETUQ2G391E_	A	(No suffix)	J		
470	25 x 50	2.39	3.35	0.423	0.212	EETUQ2G471C_	A	(No suffix)	J		
	30 x 40	2.39	3.35	0.423	0.212	EETUQ2G471D_	A	(No suffix)	J		
	35 x 30	2.39	3.35	0.423	0.212	EETUQ2G471E_	A	(No suffix)	J		
560	30 x 45	2.69	3.77	0.355	0.178	EETUQ2G561D_	A	(No suffix)	J		
	35 x 35	2.69	3.77	0.355	0.178	EETUQ2G561E_	A	(No suffix)	J		
680	35 x 40	2.70	3.78	0.293	0.146	EETUQ2G681E_	F	U	C		
	30 x 50	2.96	4.14	0.293	0.146	EETUQ2G681D_	A	(No suffix)	J		
	35 x 45	2.96	4.14	0.293	0.146	EETUQ2G681E_	A	(No suffix)	J		
820	35 x 45	2.96	4.14	0.243	0.121	EETUQ2G821E_	F	U	C		
	35 x 50	3.25	4.55	0.243	0.121	EETUQ2G821E_	A	(No suffix)	J		
420 VDC Working, 470 VDC Surge											
150	22 x 30	1.18	1.65	1.326	0.663	EETUQ2S151B_	A	(No suffix)	J		
	25 x 25	1.18	1.65	1.326	0.663	EETUQ2S151C_	A	(No suffix)	J		
180	22 x 35	1.40	1.96	1.105	0.553	EETUQ2S181B_	A	(No suffix)	J		
220	22 x 40	1.52	2.13	0.904	0.452	EETUQ2S221B_	A	(No suffix)	J		
	25 x 35	1.52	2.13	0.904	0.452	EETUQ2S221C_	A	(No suffix)	J		
	30 x 25	1.52	2.13	0.904	0.452	EETUQ2S221D_	A	(No suffix)	J		
270	22 x 45	1.73	2.42	0.737	0.368	EETUQ2S271B_	A	(No suffix)	J		
	25 x 40	1.73	2.42	0.737	0.368	EETUQ2S271C_	A	(No suffix)	J		
330	25 x 45	1.95	2.73	0.603	0.301	EETUQ2S331C_	A	(No suffix)	J		
	30 x 30	1.95	2.73	0.603	0.301	EETUQ2S331D_	A	(No suffix)	J		
390	25 x 50	2.17	3.04	0.510	0.255	EETUQ2S391C_	A	(No suffix)	J		
	30 x 35	2.17	3.04	0.510	0.255	EETUQ2S391D_	A	(No suffix)	J		
	35 x 30	2.17	3.04	0.510	0.255	EETUQ2S391E_	A	(No suffix)	J		
470	30 x 40	2.44	3.42	0.423	0.212	EETUQ2S471D_	A	(No suffix)	J		
	35 x 35	2.44	3.42	0.423	0.212	EETUQ2S471E_	A	(No suffix)	J		
560	30 x 45	2.74	3.84	0.355	0.178	EETUQ2S561D_	A	(No suffix)	J		
	35 x 40	2.74	3.84	0.355	0.178	EETUQ2S561E_	A	(No suffix)	J		
680	35 x 45	3.11	4.35	0.293	0.146	EETUQ2S681E_	A	(No suffix)	J		
450 VDC Working, 500 VDC Surge											
82	22 x 25	0.83	1.16	2.426	1.213	EETUQ2W820B_	A	(No suffix)	J		
100	22 x 25	0.93	1.30	1.989	0.995	EETUQ2W101B_	A	(No suffix)	J		
120	22 x 30	1.04	1.46	1.658	0.829	EETUQ2W121B_	A	(No suffix)	J		
150	22 x 35	1.19	1.67	1.326	0.663	EETUQ2W151B_	A	(No suffix)	J		
	25 x 30	1.19	1.67	1.326	0.663	EETUQ2W151C_	A	(No suffix)	J		
180	22 x 40	1.35	1.89	1.105	0.553	EETUQ2W181B_	A	(No suffix)	J		
	25 x 30	1.35	1.89	1.105	0.553	EETUQ2W181C_	A	(No suffix)	J		
220	22 x 45	1.55	2.17	0.904	0.452	EETUQ2W221B_	A	(No suffix)	J		
	25 x 35	1.45	2.03	0.904	0.452	EETUQ2W221C_	F	U	C		
	25 x 40	1.55	2.17	0.904	0.452	EETUQ2W221C_	A	(No suffix)	J		
	30 x 30	1.55	2.17	0.904	0.452	EETUQ2W221D_	A	(No suffix)	J		
	35 x 25	1.55	2.17	0.904	0.452	EETUQ2W221E_	A	(No suffix)	J		
270	22 x 50	1.78	2.49	0.737	0.368	EETUQ2W271B_	A	(No suffix)	J		
	25 x 40	1.78	2.49	0.737	0.368	EETUQ2W271C_	A	(No suffix)	J		
	30 x 30	1.78	2.49	0.737	0.368	EETUQ2W271D_	A	(No suffix)	J		
330	25 x 50	2.01	2.81	0.603	0.301	EETUQ2W331C_	A	(No suffix)	J		
	30 x 35	1.88	2.63	0.603	0.301	EETUQ2W331D_	F	U	C		
	30 x 40	2.01	2.81	0.603	0.301	EETUQ2W331D_	A	(No suffix)	J		
	35 x 30	2.01	2.81	0.603	0.301	EETUQ2W331E_	A	(No suffix)	J		
390	30 x 40	2.24	3.14	0.510	0.255	EETUQ2W391D_	A	(No suffix)	J		
	35 x 35	2.24	3.14	0.510	0.255	EETUQ2W391E_	A	(No suffix)	J		
470	30 x 45	2.53	3.54	0.423	0.212	EETUQ2W471D_	A	(No suffix)	J		
	35 x 40	2.53	3.54	0.423	0.212	EETUQ2W471E_	A	(No suffix)	J		
560	30 x 50	2.82	3.95	0.355	0.178	EETUQ2W561D_	A	(No suffix)	J		
	35 x 45	2.82	3.95	0.355	0.178	EETUQ2W561E_	A	(No suffix)	J		
680	35 x 50	3.02	4.23	0.293	0.146	EETUQ2W681E_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-UP Series 85°C, 3000 hours*

- Compact size for general purpose and industrial applications
- 2 and 3 pin versions available
- 20mm lengths for low profile applications



Rated Working Voltage:	16 ~ 250 VDC		350 ~ 500 VDC									
Operating Temperature:	-40 ~ +85°C		-25 ~ +85°C									
Nominal Capacitance:	120 ~ 82000µF (±20% tolerance)		33 ~ 1000µF (±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: $\frac{(\text{rated cap. } [\mu\text{F}] - 33000)}{1000}$												
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~	Ripple Current Ambient Temperature Factors**				
	16-100WV:	0.93	0.95	1.0	1.05	1.08	1.15	Temperature (°C):	85°C	70°C	60°C	≤45°C
	160-500WV:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier:	1.0	1.3	1.4	1.5
Endurance:	3000 hours at +85°C with maximum specified ripple current (see page 6) *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				P						
Common Code / Terminal Type				Voltage Code		Series		Capacitance Code		Case Diameter	
ECOS	2 pin, 6.3mm Length Terminal (Standard)										
ECEC	2 pin, 4.0mm Length "Short" Terminal										
ECE3	3 Pin, 4.0mm Length Terminal										
(Please see page 10 for details)											
Insulation Options											
25 ~ 50mm lengths											
A	PVC with top plate										
B	PVC without top plate										
20mm length											
L	PVC with top plate										
G	PVC without top plate										
Extended Capacitance Ratings											
X	PVC with top plate										

TS-UP Standard Ratings (part numbers shown with 2 pins, 6.3mm length terminal, and top vinyl plate)

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	10kHz~	120Hz	20kHz				120Hz	20kHz			
16 VDC Working, 20 VDC Surge							25 VDC Working, 32 VDC Surge (continued)						
4700	22 x 20	1.60	1.84	0.159	0.135	ECOS1CP472BL	6800	22 x 30	3.47	3.99	0.078	0.062	ECOS1EP682BA
	22 x 25	1.77	2.04	0.159	0.135	ECOS1CP472BA		25 x 25	3.47	3.99	0.078	0.062	ECOS1EP682CA
6800	22 x 25	2.57	2.96	0.110	0.093	ECOS1CP682BA		30 x 20	2.30	2.65	0.078	0.062	ECOS1EP682DL
	25 x 20	1.80	2.07	0.110	0.093	ECOS1CP682CL	8200	22 x 30	3.57	4.11	0.065	0.052	ECOS1EP822BA
8200	22 x 25	3.10	3.57	0.091	0.077	ECOS1CP822BA		25 x 25	3.57	4.11	0.065	0.052	ECOS1EP822CA
10000	22 x 30	3.78	4.35	0.075	0.063	ECOS1CP103BA	10000	22 x 35	3.78	4.35	0.058	0.046	ECOS1EP103BA
	25 x 25	3.78	4.35	0.075	0.063	ECOS1CP103CA		25 x 30	3.78	4.35	0.058	0.046	ECOS1EP103CA
	30 x 20	2.40	2.76	0.083	0.070	ECOS1CP103DL		30 x 25	3.78	4.35	0.058	0.046	ECOS1EP103DA
12000	22 x 30	4.52	5.20	0.062	0.053	ECOS1CP123BA		35 x 20	2.70	3.11	0.061	0.049	ECOS1EP103EL
	25 x 25	4.52	5.20	0.062	0.053	ECOS1CP123CA	12000	22 x 40	4.10	4.72	0.048	0.039	ECOS1EP123BA
15000	22 x 35	5.26	6.05	0.053	0.045	ECOS1CP153BA		25 x 35	4.10	4.72	0.048	0.039	ECOS1EP123CA
	25 x 30	5.26	6.05	0.053	0.045	ECOS1CP153CA		30 x 30	4.10	4.72	0.048	0.039	ECOS1EP123DA
	35 x 20	3.20	3.68	0.055	0.047	ECOS1CP153EL	15000	22 x 50	4.63	5.32	0.039	0.031	ECOS1EP153BA
18000	22 x 40	5.57	6.41	0.046	0.039	ECOS1CP183BA		25 x 40	4.63	5.32	0.039	0.031	ECOS1EP153CA
	25 x 30	5.57	6.41	0.046	0.039	ECOS1CP183CA		30 x 30	4.63	5.32	0.039	0.031	ECOS1EP153DA
22000	22 x 45	6.10	7.02	0.038	0.032	ECOS1CP223BA	18000	25 x 45	5.47	6.29	0.035	0.028	ECOS1EP183CA
	25 x 35	6.10	7.02	0.038	0.032	ECOS1CP223CA		30 x 35	5.47	6.29	0.035	0.028	ECOS1EP183DA
	30 x 30	6.10	7.02	0.038	0.032	ECOS1CP223DA	22000	25 x 50	6.10	7.02	0.029	0.023	ECOS1EP223CA
27000	25 x 45	6.31	7.26	0.031	0.026	ECOS1CP273CA		30 x 40	6.10	7.02	0.029	0.023	ECOS1EP223DA
	30 x 35	6.31	7.26	0.031	0.026	ECOS1CP273DA	27000	30 x 45	6.21	7.14	0.023	0.019	ECOS1EP273DA
33000	25 x 50	6.84	7.87	0.025	0.021	ECOS1CP333CA		35 x 35	6.21	7.14	0.025	0.020	ECOS1EP273EA
	30 x 40	6.84	7.87	0.025	0.021	ECOS1CP333DA	33000	30 x 50	6.84	7.87	0.020	0.017	ECOS1EP333DA
	35 x 30	6.84	7.87	0.025	0.021	ECOS1CP333EA		35 x 40	6.84	7.87	0.020	0.017	ECOS1EP333EA
39000	30 x 45	6.94	7.98	0.021	0.018	ECOS1CP393DA	39000	35 x 45	7.36	8.46	0.019	0.017	ECOS1EP393EA
	35 x 35	6.94	7.98	0.021	0.018	ECOS1CP393EA	47000	35 x 50	8.00	9.20	0.017	0.015	ECOS1EP473EA
47000	30 x 50	7.47	8.59	0.019	0.017	ECOS1CP473DA	35 VDC Working, 44 VDC Surge						
	35 x 40	7.47	8.59	0.021	0.019	ECOS1CP473EA	2200	22 x 20	1.40	1.61	0.181	0.136	ECOS1VP222BL
56000	35 x 45	8.73	10.04	0.019	0.018	ECOS1CP563EA		22 x 25	1.52	1.75	0.166	0.124	ECOS1VP222BA
68000	35 x 50	9.05	10.41	0.018	0.017	ECOS1CP683EA	3300	22 x 25	2.29	2.63	0.111	0.083	ECOS1VP332BA
25 VDC Working, 32 VDC Surge								25 x 20	1.70	1.96	0.121	0.090	ECOS1VP332CL
3300	22 x 20	1.60	1.84	0.176	0.141	ECOS1EP332BL	3900	22 x 25	2.71	3.12	0.094	0.070	ECOS1VP392BA
	22 x 25	1.68	1.93	0.161	0.129	ECOS1EP332BA	4700	22 x 30	3.26	3.75	0.078	0.058	ECOS1VP472BA
4700	22 x 25	2.39	2.75	0.113	0.090	ECOS1EP472BA		25 x 25	3.26	3.75	0.078	0.058	ECOS1VP472CA
	25 x 20	1.80	2.07	0.123	0.099	ECOS1EP472CL		30 x 20	2.00	2.30	0.088	0.066	ECOS1VP472DL
5600	22 x 25	2.86	3.29	0.095	0.076	ECOS1EP562BA	5600	22 x 30	3.36	3.86	0.080	0.060	ECOS1VP562BA

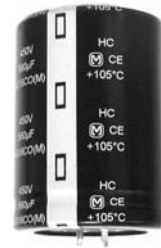
LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

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
		120Hz	10kHz~	120Hz	20kHz	
450 VDC Working, 500 VDC Surge (continued)						
270	35 x 35	1.78	2.49	0.675	0.270	ECOS2WP271EA
330	30 x 50	2.01	2.81	0.553	0.249	ECOS2WP331DA
	35 x 35	2.01	2.81	0.553	0.221	ECOS2WP331EX
	35 x 40	2.01	2.81	0.553	0.249	ECOS2WP331EA
390	35 x 45	2.24	3.14	0.510	0.255	ECOS2WP391EA
470	35 x 45	2.53	3.54	0.423	0.233	ECOS2WP471EX
	35 x 50	2.53	3.54	0.423	0.233	ECOS2WP471EA
500 VDC Working, 550 VDC Surge (continued)						
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
	25 x 25	0.78	1.09	2.438	0.975	ECOS2HP680CA
82	22 x 40	0.88	1.23	2.022	0.809	ECOS2HP820BA
	25 x 30	0.88	1.23	2.022	0.809	ECOS2HP820CA
100	22 x 45	0.99	1.39	1.658	0.663	ECOS2HP101BA
	25 x 35	0.99	1.39	1.658	0.663	ECOS2HP101CA
120	22 x 50	1.13	1.58	1.382	0.553	ECOS2HP121BA
	25 x 40	1.13	1.58	1.382	0.553	ECOS2HP121CA
	30 x 30	1.13	1.58	1.382	0.553	ECOS2HP121DA
150	25 x 45	1.29	1.80	1.105	0.442	ECOS2HP151CA
	30 x 35	1.29	1.80	1.105	0.442	ECOS2HP151DA
	35 x 25	1.20	1.68	1.105	0.442	ECOS2HP151EA
180	25 x 50	1.38	1.93	0.921	0.368	ECOS2HP181CA
	30 x 40	1.38	1.93	0.921	0.368	ECOS2HP181DA
	35 x 30	1.36	1.90	0.921	0.368	ECOS2HP181EA
220	30 x 45	1.50	2.10	0.754	0.339	ECOS2HP221DA
	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

TS-HC Series 105°C, 2000 hours

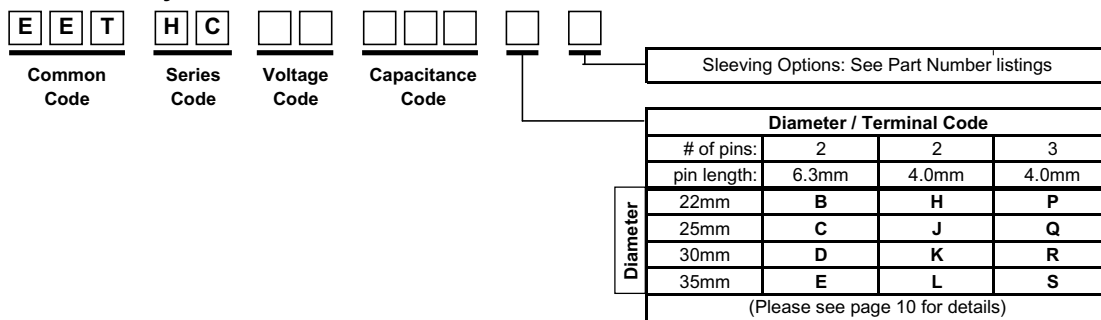
- Highly miniaturized version (30% smaller than HB series)
- 2 and 3 pin versions available
- PET Sleeve Option



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 450 VDC	
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C	
Nominal Capacitance:	270 ~ 100000µF	100 ~ 820µF	
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: $\frac{\text{(rated cap. } [\mu\text{F}] - 33000)}{1000}$		
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	
	10~100WV:	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:	2000 hours at +105°C with maximum specified ripple current (see page 6)		

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

Part Number System



TS-HC Standard Ratings

(part numbers shown with 2 pins and 6.3mm length terminal)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})				20°C ESR (Ω, max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
		10 VDC Working, 13 VDC Surge									
12000	22 x 25	2.20	2.53	0.076	0.065	EETHC1A123B_	A	(No suffix)	J		
18000	22 x 30	2.40	2.76	0.051	0.043	EETHC1A183B_	A	(No suffix)	J		
	25 x 25	2.40	2.76	0.051	0.043	EETHC1A183C_	A	(No suffix)	J		
22000	22 x 35	2.60	2.99	0.041	0.035	EETHC1A223B_	A	(No suffix)	J		
	25 x 30	2.60	2.99	0.041	0.035	EETHC1A223C_	A	(No suffix)	J		
27000	22 x 40	3.10	3.57	0.034	0.029	EETHC1A273B_	A	(No suffix)	J		
	25 x 35	3.10	3.57	0.034	0.029	EETHC1A273C_	A	(No suffix)	J		
	30 x 25	3.10	3.57	0.034	0.029	EETHC1A273D_	A	(No suffix)	J		
33000	22 x 45	3.40	3.91	0.028	0.023	EETHC1A333B_	A	(No suffix)	J		
	25 x 40	3.40	3.91	0.028	0.023	EETHC1A333C_	A	(No suffix)	J		
39000	25 x 45	3.70	4.26	0.026	0.022	EETHC1A393C_	A	(No suffix)	J		
	30 x 30	3.70	4.26	0.026	0.023	EETHC1A393D_	A	(No suffix)	J		
	35 x 25	3.70	4.26	0.026	0.022	EETHC1A393E_	A	(No suffix)	J		
47000	25 x 50	4.20	4.83	0.024	0.021	EETHC1A473C_	A	(No suffix)	J		
	30 x 35	4.20	4.83	0.024	0.022	EETHC1A473D_	A	(No suffix)	J		
	35 x 30	4.20	4.83	0.024	0.021	EETHC1A473E_	A	(No suffix)	J		
56000	30 x 40	5.00	5.75	0.023	0.021	EETHC1A563D_	A	(No suffix)	J		
	35 x 35	5.00	5.75	0.023	0.020	EETHC1A563E_	A	(No suffix)	J		
68000	30 x 45	5.40	6.21	0.022	0.020	EETHC1A683D_	A	(No suffix)	J		
	35 x 40	5.40	6.21	0.022	0.019	EETHC1A683E_	A	(No suffix)	J		
82000	35 x 45	6.10	7.02	0.021	0.019	EETHC1A823E_	A	(No suffix)	J		
100000	35 x 50	6.90	7.94	0.020	0.019	EETHC1A104E_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HC Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
16 VDC Working, 20 VDC Surge											
10000	22 x 25	2.60	2.99	0.075	0.063	EETHC1C103B_	A	(No suffix)	J		
12000	22 x 30	2.90	3.34	0.062	0.053	EETHC1C123B_	A	(No suffix)	J		
	25 x 25	2.90	3.34	0.062	0.053	EETHC1C123C_	A	(No suffix)	J		
15000	22 x 35	3.20	3.68	0.050	0.042	EETHC1C153B_	A	(No suffix)	J		
18000	22 x 40	3.50	4.03	0.041	0.035	EETHC1C183B_	A	(No suffix)	J		
	25 x 30	3.50	4.03	0.041	0.035	EETHC1C183C_	A	(No suffix)	J		
22000	22 x 45	3.80	4.37	0.034	0.029	EETHC1C223B_	A	(No suffix)	J		
	25 x 35	3.80	4.37	0.034	0.029	EETHC1C223C_	A	(No suffix)	J		
	30 x 25	3.80	4.37	0.034	0.029	EETHC1C223D_	A	(No suffix)	J		
27000	22 x 50	4.20	4.83	0.028	0.023	EETHC1C273B_	A	(No suffix)	J		
	25 x 40	4.20	4.83	0.028	0.023	EETHC1C273C_	A	(No suffix)	J		
	30 x 30	4.20	4.83	0.028	0.023	EETHC1C273D_	A	(No suffix)	J		
	35 x 25	4.20	4.83	0.028	0.023	EETHC1C273E_	A	(No suffix)	J		
33000	25 x 45	4.70	5.41	0.023	0.019	EETHC1C333C_	A	(No suffix)	J		
	30 x 35	4.70	5.41	0.023	0.019	EETHC1C333D_	A	(No suffix)	J		
	35 x 30	4.70	5.41	0.023	0.020	EETHC1C333E_	A	(No suffix)	J		
39000	30 x 40	5.10	5.87	0.022	0.018	EETHC1C393D_	A	(No suffix)	J		
	35 x 35	5.10	5.87	0.022	0.020	EETHC1C393E_	A	(No suffix)	J		
47000	30 x 45	5.50	6.33	0.016	0.014	EETHC1C473D_	A	(No suffix)	J		
	35 x 40	5.50	6.33	0.021	0.019	EETHC1C473E_	A	(No suffix)	J		
56000	30 x 50	6.00	6.90	0.020	0.018	EETHC1C563D_	A	(No suffix)	J		
	35 x 45	6.00	6.90	0.020	0.018	EETHC1C563E_	A	(No suffix)	J		
25 VDC Working, 32 VDC Surge											
6800	22 x 25	2.40	2.76	0.085	0.064	EETHC1E682B_	A	(No suffix)	J		
8200	22 x 30	2.70	3.11	0.071	0.053	EETHC1E822B_	A	(No suffix)	J		
	25 x 25	2.70	3.11	0.071	0.053	EETHC1E822C_	A	(No suffix)	J		
10000	22 x 35	3.00	3.45	0.058	0.044	EETHC1E103B_	A	(No suffix)	J		
12000	22 x 40	3.20	3.68	0.048	0.036	EETHC1E123B_	A	(No suffix)	J		
	25 x 30	3.20	3.68	0.048	0.036	EETHC1E123C_	A	(No suffix)	J		
15000	22 x 45	3.60	4.14	0.039	0.029	EETHC1E153B_	A	(No suffix)	J		
	25 x 35	3.60	4.14	0.039	0.029	EETHC1E153C_	A	(No suffix)	J		
	30 x 25	3.60	4.14	0.039	0.029	EETHC1E153D_	A	(No suffix)	J		
18000	22 x 50	3.90	4.49	0.032	0.024	EETHC1E183B_	A	(No suffix)	J		
	25 x 40	3.90	4.49	0.032	0.024	EETHC1E183C_	A	(No suffix)	J		
	30 x 30	3.90	4.49	0.032	0.024	EETHC1E183D_	A	(No suffix)	J		
	35 x 25	3.90	4.49	0.032	0.024	EETHC1E183E_	A	(No suffix)	J		
22000	25 x 45	4.30	4.95	0.026	0.020	EETHC1E223C_	A	(No suffix)	J		
	30 x 35	4.30	4.95	0.026	0.020	EETHC1E223D_	A	(No suffix)	J		
	35 x 30	4.30	4.95	0.026	0.020	EETHC1E223E_	A	(No suffix)	J		
27000	30 x 40	4.80	5.52	0.021	0.016	EETHC1E273D_	A	(No suffix)	J		
	35 x 35	4.80	5.52	0.021	0.016	EETHC1E273E_	A	(No suffix)	J		
33000	30 x 45	5.50	6.33	0.018	0.013	EETHC1E333D_	A	(No suffix)	J		
	35 x 40	5.50	6.33	0.018	0.014	EETHC1E333E_	A	(No suffix)	J		
39000	30 x 50	5.80	6.67	0.017	0.013	EETHC1E393D_	A	(No suffix)	J		
	35 x 45	5.80	6.67	0.017	0.014	EETHC1E393E_	A	(No suffix)	J		
47000	35 x 50	6.30	7.25	0.017	0.014	EETHC1E473E_	A	(No suffix)	J		
35 VDC Working, 44 VDC Surge											
4700	22 x 25	2.20	2.53	0.106	0.079	EETHC1V472B_	A	(No suffix)	J		
5600	22 x 30	2.40	2.76	0.089	0.067	EETHC1V562B_	A	(No suffix)	J		
	25 x 25	2.40	2.76	0.089	0.067	EETHC1V562C_	A	(No suffix)	J		
6800	22 x 35	2.60	2.99	0.073	0.055	EETHC1V682B_	A	(No suffix)	J		
8200	22 x 40	2.90	3.34	0.061	0.045	EETHC1V822B_	A	(No suffix)	J		
	25 x 30	2.90	3.34	0.061	0.045	EETHC1V822C_	A	(No suffix)	J		
10000	22 x 45	3.20	3.68	0.050	0.037	EETHC1V103B_	A	(No suffix)	J		
	25 x 35	3.20	3.68	0.050	0.037	EETHC1V103C_	A	(No suffix)	J		
	30 x 25	3.20	3.68	0.050	0.037	EETHC1V103D_	A	(No suffix)	J		
12000	25 x 40	3.50	4.03	0.041	0.031	EETHC1V123C_	A	(No suffix)	J		
	30 x 30	3.50	4.03	0.041	0.031	EETHC1V123D_	A	(No suffix)	J		
	35 x 25	3.50	4.03	0.041	0.031	EETHC1V123E_	A	(No suffix)	J		
15000	25 x 45	3.90	4.49	0.033	0.025	EETHC1V153C_	A	(No suffix)	J		
	30 x 35	3.90	4.49	0.033	0.025	EETHC1V153D_	A	(No suffix)	J		
	35 x 30	3.90	4.49	0.033	0.025	EETHC1V153E_	A	(No suffix)	J		

TS-HC Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz	10kHz~	120Hz	20kHz	PVC with Top Plate	PVC without Top Plate		PET without Top Plate		
35 VDC Working, 44 VDC Surge (continued)											
18000	30 x 40	4.30	4.95	0.028	0.021	EETHC1V183D_	A	(No suffix)	J		
	35 x 35	4.30	4.95	0.028	0.021	EETHC1V183E_	A	(No suffix)	J		
22000	30 x 45	5.00	5.75	0.023	0.017	EETHC1V223D_	A	(No suffix)	J		
	35 x 40	5.00	5.75	0.023	0.017	EETHC1V223E_	A	(No suffix)	J		
27000	30 x 50	5.30	6.10	0.018	0.014	EETHC1V273D_	A	(No suffix)	J		
	35 x 45	5.30	6.10	0.018	0.014	EETHC1V273E_	A	(No suffix)	J		
33000	35 x 50	5.90	6.79	0.015	0.012	EETHC1V333E_	A	(No suffix)	J		
50 VDC Working, 63 VDC Surge											
2700	22 x 25	1.80	2.07	0.154	0.115	EETHC1H272B_	A	(No suffix)	J		
3300	22 x 30	2.00	2.30	0.126	0.094	EETHC1H332B_	A	(No suffix)	J		
3900	22 x 35	2.20	2.53	0.106	0.080	EETHC1H392B_	A	(No suffix)	J		
	25 x 25	2.20	2.53	0.106	0.080	EETHC1H392C_	A	(No suffix)	J		
4700	22 x 40	2.50	2.88	0.088	0.066	EETHC1H472B_	A	(No suffix)	J		
	25 x 30	2.50	2.88	0.088	0.066	EETHC1H472C_	A	(No suffix)	J		
5600	22 x 45	2.80	3.22	0.074	0.056	EETHC1H562B_	A	(No suffix)	J		
	25 x 35	2.80	3.22	0.074	0.056	EETHC1H562C_	A	(No suffix)	J		
	30 x 25	2.80	3.22	0.074	0.056	EETHC1H562D_	A	(No suffix)	J		
6800	22 x 50	3.30	3.80	0.061	0.046	EETHC1H682B_	A	(No suffix)	J		
	25 x 40	3.30	3.80	0.061	0.046	EETHC1H682C_	A	(No suffix)	J		
	30 x 30	3.30	3.80	0.061	0.046	EETHC1H682D_	A	(No suffix)	J		
	35 x 25	3.30	3.80	0.061	0.046	EETHC1H682E_	A	(No suffix)	J		
8200	25 x 45	3.60	4.14	0.051	0.038	EETHC1H822C_	A	(No suffix)	J		
	30 x 35	3.60	4.14	0.051	0.038	EETHC1H822D_	A	(No suffix)	J		
10000	25 x 50	4.00	4.60	0.041	0.031	EETHC1H103C_	A	(No suffix)	J		
	30 x 40	4.00	4.60	0.041	0.031	EETHC1H103D_	A	(No suffix)	J		
	35 x 30	4.00	4.60	0.041	0.031	EETHC1H103E_	A	(No suffix)	J		
12000	30 x 45	4.50	5.18	0.035	0.026	EETHC1H123D_	A	(No suffix)	J		
	35 x 35	4.50	5.18	0.035	0.028	EETHC1H123E_	A	(No suffix)	J		
15000	30 x 50	4.80	5.52	0.028	0.021	EETHC1H153D_	A	(No suffix)	J		
	35 x 40	4.80	5.52	0.028	0.022	EETHC1H153E_	A	(No suffix)	J		
18000	35 x 45	5.60	6.44	0.023	0.018	EETHC1H183E_	A	(No suffix)	J		
63 VDC Working, 79 VDC Surge											
2200	22 x 25	2.00	2.30	0.151	0.113	EETHC1J222B_	A	(No suffix)	J		
2700	22 x 30	2.20	2.53	0.123	0.092	EETHC1J272B_	A	(No suffix)	J		
	25 x 25	2.20	2.53	0.123	0.092	EETHC1J272C_	A	(No suffix)	J		
3300	22 x 35	2.50	2.88	0.100	0.075	EETHC1J332B_	A	(No suffix)	J		
3900	22 x 40	2.70	3.11	0.085	0.064	EETHC1J392B_	A	(No suffix)	J		
	25 x 30	2.70	3.11	0.085	0.064	EETHC1J392C_	A	(No suffix)	J		
	30 x 25	2.70	3.11	0.085	0.064	EETHC1J392D_	A	(No suffix)	J		
4700	22 x 45	3.00	3.45	0.071	0.053	EETHC1J472B_	A	(No suffix)	J		
	25 x 35	3.00	3.45	0.071	0.053	EETHC1J472C_	A	(No suffix)	J		
5600	22 x 50	3.30	3.80	0.059	0.044	EETHC1J562B_	A	(No suffix)	J		
	25 x 40	3.30	3.80	0.059	0.044	EETHC1J562C_	A	(No suffix)	J		
	30 x 30	3.30	3.80	0.059	0.044	EETHC1J562D_	A	(No suffix)	J		
	35 x 25	3.30	3.80	0.059	0.044	EETHC1J562E_	A	(No suffix)	J		
6800	25 x 45	3.60	4.14	0.049	0.037	EETHC1J682C_	A	(No suffix)	J		
	30 x 35	3.60	4.14	0.049	0.037	EETHC1J682D_	A	(No suffix)	J		
	35 x 30	3.60	4.14	0.049	0.037	EETHC1J682E_	A	(No suffix)	J		
8200	30 x 40	3.90	4.49	0.040	0.030	EETHC1J822D_	A	(No suffix)	J		
	35 x 35	3.90	4.49	0.040	0.030	EETHC1J822E_	A	(No suffix)	J		
10000	30 x 45	4.40	5.06	0.033	0.025	EETHC1J103D_	A	(No suffix)	J		
	35 x 40	4.40	5.06	0.033	0.025	EETHC1J103E_	A	(No suffix)	J		
12000	30 x 50	4.80	5.52	0.028	0.021	EETHC1J123D_	A	(No suffix)	J		
	35 x 45	4.80	5.52	0.028	0.022	EETHC1J123E_	A	(No suffix)	J		
15000	35 x 50	5.40	6.21	0.022	0.018	EETHC1J153E_	A	(No suffix)	J		
80 VDC Working, 100 VDC Surge											
1200	22 x 25	1.50	1.73	0.235	0.176	EETHC1K122B_	A	(No suffix)	J		
1500	22 x 30	1.70	1.96	0.188	0.141	EETHC1K152B_	A	(No suffix)	J		
	25 x 25	1.70	1.96	0.188	0.141	EETHC1K152C_	A	(No suffix)	J		
1800	22 x 35	1.80	2.07	0.157	0.117	EETHC1K182B_	A	(No suffix)	J		
2200	22 x 40	2.10	2.42	0.128	0.096	EETHC1K222B_	A	(No suffix)	J		
	25 x 30	2.10	2.42	0.128	0.096	EETHC1K222C_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HC Standard Ratings (continued)

Part Number Suffix Slewing Options

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number	PVC with Top Plate	PVC without Top Plate	PET without Top Plate
		120Hz	10kHz~	120Hz	20kHz				
80 VDC Working, 100 VDC Surge (continued)									
2700	22 x 45	2.40	2.76	0.104	0.078	EETHC1K272B_	A	(No suffix)	J
	25 x 35	2.40	2.76	0.104	0.078	EETHC1K272C_	A	(No suffix)	J
	30 x 25	2.40	2.76	0.104	0.078	EETHC1K272D_	A	(No suffix)	J
3300	22 x 50	2.60	2.99	0.085	0.064	EETHC1K332B_	A	(No suffix)	J
	25 x 40	2.60	2.99	0.085	0.064	EETHC1K332C_	A	(No suffix)	J
	30 x 30	2.60	2.99	0.085	0.064	EETHC1K332D_	A	(No suffix)	J
	35 x 25	2.60	2.99	0.085	0.064	EETHC1K332E_	A	(No suffix)	J
3900	25 x 45	3.00	3.45	0.072	0.054	EETHC1K392C_	A	(No suffix)	J
	30 x 35	3.00	3.45	0.072	0.054	EETHC1K392D_	A	(No suffix)	J
4700	25 x 50	3.30	3.80	0.060	0.045	EETHC1K472C_	A	(No suffix)	J
	30 x 40	3.30	3.80	0.060	0.045	EETHC1K472D_	A	(No suffix)	J
	35 x 30	3.30	3.80	0.060	0.045	EETHC1K472E_	A	(No suffix)	J
5600	30 x 45	3.70	4.26	0.050	0.038	EETHC1K562D_	A	(No suffix)	J
	35 x 35	3.70	4.26	0.050	0.038	EETHC1K562E_	A	(No suffix)	J
6800	30 x 50	3.90	4.49	0.041	0.031	EETHC1K682D_	A	(No suffix)	J
	35 x 40	3.90	4.49	0.041	0.032	EETHC1K682E_	A	(No suffix)	J
8200	35 x 45	4.50	5.18	0.034	0.027	EETHC1K822E_	A	(No suffix)	J
100 VDC Working, 125 VDC Surge									
820	22 x 25	1.40	1.61	0.303	0.197	EETHC2A821B_	A	(No suffix)	J
1200	22 x 30	1.80	2.07	0.207	0.135	EETHC2A122B_	A	(No suffix)	J
	25 x 25	1.80	2.07	0.207	0.135	EETHC2A122C_	A	(No suffix)	J
1500	22 x 35	2.10	2.42	0.166	0.108	EETHC2A152B_	A	(No suffix)	J
	25 x 30	2.10	2.42	0.166	0.108	EETHC2A152C_	A	(No suffix)	J
1800	22 x 40	2.30	2.65	0.138	0.090	EETHC2A182B_	A	(No suffix)	J
	25 x 35	2.30	2.65	0.138	0.090	EETHC2A182C_	A	(No suffix)	J
	30 x 25	2.30	2.65	0.138	0.090	EETHC2A182D_	A	(No suffix)	J
2200	22 x 45	2.60	2.99	0.113	0.073	EETHC2A222B_	A	(No suffix)	J
	25 x 40	2.60	2.99	0.113	0.073	EETHC2A222C_	A	(No suffix)	J
	30 x 30	2.60	2.99	0.113	0.073	EETHC2A222D_	A	(No suffix)	J
	35 x 25	2.60	2.99	0.113	0.073	EETHC2A222E_	A	(No suffix)	J
2700	25 x 45	2.90	3.34	0.092	0.060	EETHC2A272C_	A	(No suffix)	J
	30 x 35	2.90	3.34	0.092	0.060	EETHC2A272D_	A	(No suffix)	J
3300	25 x 50	3.20	3.68	0.075	0.049	EETHC2A332C_	A	(No suffix)	J
	30 x 40	3.20	3.68	0.075	0.049	EETHC2A332D_	A	(No suffix)	J
	35 x 30	3.20	3.68	0.075	0.049	EETHC2A332E_	A	(No suffix)	J
3900	30 x 45	3.60	4.14	0.064	0.043	EETHC2A392D_	A	(No suffix)	J
	35 x 35	3.60	4.14	0.064	0.043	EETHC2A392E_	A	(No suffix)	J
4700	30 x 50	3.80	4.37	0.053	0.038	EETHC2A472D_	A	(No suffix)	J
	35 x 40	3.80	4.37	0.053	0.037	EETHC2A472E_	A	(No suffix)	J
5600	35 x 45	4.20	4.83	0.044	0.031	EETHC2A562E_	A	(No suffix)	J
6800	35 x 50	4.70	5.41	0.037	0.027	EETHC2A682E_	A	(No suffix)	J
160 VDC Working, 200 VDC Surge									
470	22 x 25	1.40	1.96	0.423	0.190	EETHC2C471B_	A	(No suffix)	J
560	22 x 30	1.50	2.10	0.355	0.160	EETHC2C561B_	A	(No suffix)	J
680	22 x 30	1.70	2.38	0.293	0.132	EETHC2C681B_	A	(No suffix)	J
	25 x 25	1.70	2.38	0.293	0.132	EETHC2C681C_	A	(No suffix)	J
820	22 x 35	2.00	2.80	0.243	0.109	EETHC2C821B_	A	(No suffix)	J
	25 x 30	2.00	2.80	0.243	0.109	EETHC2C821C_	A	(No suffix)	J
1000	22 x 40	2.20	3.08	0.199	0.090	EETHC2C102B_	A	(No suffix)	J
1000	25 x 35	2.20	3.08	0.199	0.090	EETHC2C102C_	A	(No suffix)	J
	30 x 25	2.20	3.08	0.216	0.108	EETHC2C102D_	A	(No suffix)	J
1200	22 x 45	2.30	3.22	0.166	0.075	EETHC2C122B_	A	(No suffix)	J
	25 x 40	2.30	3.22	0.166	0.075	EETHC2C122C_	A	(No suffix)	J
	30 x 30	2.30	3.22	0.166	0.075	EETHC2C122D_	A	(No suffix)	J
	35 x 25	2.30	3.22	0.180	0.090	EETHC2C122E_	A	(No suffix)	J
1500	25 x 45	2.50	3.50	0.133	0.060	EETHC2C152C_	A	(No suffix)	J
	30 x 35	2.50	3.50	0.133	0.060	EETHC2C152D_	A	(No suffix)	J
	35 x 30	2.50	3.50	0.155	0.077	EETHC2C152E_	A	(No suffix)	J
1800	25 x 50	2.70	3.78	0.111	0.050	EETHC2C182C_	A	(No suffix)	J
	30 x 40	2.70	3.78	0.111	0.050	EETHC2C182D_	A	(No suffix)	J
	35 x 30	2.70	3.78	0.120	0.060	EETHC2C182E_	A	(No suffix)	J

TS-HC Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
160 VDC Working, 200 VDC Surge (continued)											
2200	30 x 45	2.90	4.06	0.090	0.041	EETHC2C222D_	A	(No suffix)	J		
	35 x 35	2.90	4.06	0.098	0.049	EETHC2C222E_	A	(No suffix)	J		
2700	30 x 50	3.10	4.34	0.080	0.040	EETHC2C272D_	A	(No suffix)	J		
	35 x 40	3.10	4.34	0.086	0.043	EETHC2C272E_	A	(No suffix)	J		
3300	35 x 50	3.30	4.62	0.070	0.042	EETHC2C332E_	A	(No suffix)	J		
200 VDC Working, 250 VDC Surge											
390	22 x 25	1.31	1.83	0.510	0.230	EETHC2D391B_	A	(No suffix)	J		
470	22 x 30	1.45	2.03	0.423	0.190	EETHC2D471B_	A	(No suffix)	J		
560	22 x 30	1.67	2.34	0.355	0.160	EETHC2D561B_	A	(No suffix)	J		
680	22 x 40	1.75	2.45	0.293	0.132	EETHC2D681B_	A	(No suffix)	J		
	25 x 30	1.75	2.45	0.293	0.132	EETHC2D681C_	A	(No suffix)	J		
820	22 x 45	2.04	2.86	0.243	0.109	EETHC2D821B_	A	(No suffix)	J		
	25 x 35	2.04	2.86	0.243	0.109	EETHC2D821C_	A	(No suffix)	J		
	30 x 25	2.04	2.86	0.243	0.109	EETHC2D821D_	A	(No suffix)	J		
1000	22 x 50	2.30	3.22	0.199	0.090	EETHC2D102B_	A	(No suffix)	J		
	25 x 40	2.07	2.90	0.199	0.090	EETHC2D102C_	F	U	C		
	25 x 45	2.30	3.22	0.199	0.090	EETHC2D102C_	A	(No suffix)	J		
	30 x 30	2.30	3.22	0.199	0.090	EETHC2D102D_	A	(No suffix)	J		
	35 x 25	2.30	3.22	0.216	0.097	EETHC2D102E_	A	(No suffix)	J		
1200	25 x 45	2.38	3.33	0.166	0.075	EETHC2D122C_	F	U	C		
	25 x 50	2.65	3.71	0.166	0.075	EETHC2D122C_	A	(No suffix)	J		
	30 x 35	2.65	3.71	0.166	0.075	EETHC2D122D_	A	(No suffix)	J		
	35 x 30	2.65	3.71	0.180	0.090	EETHC2D122E_	A	(No suffix)	J		
1500	30 x 40	2.80	3.92	0.133	0.060	EETHC2D152D_	A	(No suffix)	J		
	35 x 30	2.80	3.92	0.144	0.072	EETHC2D152E_	A	(No suffix)	J		
1800	30 x 45	3.08	4.31	0.111	0.050	EETHC2D182D_	A	(No suffix)	J		
	35 x 40	3.08	4.31	0.129	0.064	EETHC2D182E_	A	(No suffix)	J		
2200	30 x 50	3.48	4.87	0.090	0.041	EETHC2D222D_	A	(No suffix)	J		
	35 x 45	3.48	4.87	0.098	0.044	EETHC2D222E_	A	(No suffix)	J		
250 VDC Working, 300 VDC Surge											
270	22 x 25	1.10	1.54	0.614	0.276	EETHC2E271B_	A	(No suffix)	J		
330	22 x 30	1.20	1.68	0.502	0.226	EETHC2E331B_	A	(No suffix)	J		
	25 x 25	1.20	1.68	0.502	0.226	EETHC2E331C_	A	(No suffix)	J		
390	22 x 30	1.20	1.68	0.425	0.191	EETHC2E391B_	F	U	C		
	22 x 35	1.30	1.82	0.425	0.191	EETHC2E391B_	A	(No suffix)	J		
	25 x 25	1.30	1.82	0.425	0.191	EETHC2E391C_	A	(No suffix)	J		
470	22 x 35	1.20	1.68	0.353	0.159	EETHC2E471B_	F	U	C		
	22 x 40	1.40	1.96	0.353	0.159	EETHC2E471B_	A	(No suffix)	J		
	25 x 30	1.40	1.96	0.353	0.159	EETHC2E471C_	A	(No suffix)	J		
	30 x 25	1.40	1.96	0.353	0.159	EETHC2E471D_	A	(No suffix)	J		
560	22 x 40	1.40	1.96	0.296	0.133	EETHC2E561B_	F	U	C		
	22 x 45	1.50	2.10	0.296	0.133	EETHC2E561B_	A	(No suffix)	J		
	25 x 35	1.50	2.10	0.296	0.133	EETHC2E561C_	A	(No suffix)	J		
	30 x 25	1.50	2.10	0.296	0.133	EETHC2E561D_	A	(No suffix)	J		
680	22 x 45	1.50	2.10	0.244	0.110	EETHC2E681B_	F	U	C		
	22 x 50	1.70	2.38	0.244	0.110	EETHC2E681B_	A	(No suffix)	J		
	25 x 40	1.70	2.38	0.244	0.110	EETHC2E681C_	A	(No suffix)	J		
	30 x 30	1.70	2.38	0.244	0.110	EETHC2E681D_	A	(No suffix)	J		
	35 x 25	1.70	2.38	0.244	0.110	EETHC2E681E_	A	(No suffix)	J		
820	25 x 45	2.00	2.80	0.202	0.091	EETHC2E821C_	A	(No suffix)	J		
	30 x 35	2.00	2.80	0.202	0.091	EETHC2E821D_	A	(No suffix)	J		
	35 x 30	2.00	2.80	0.202	0.091	EETHC2E821E_	A	(No suffix)	J		
1000	25 x 50	2.20	3.08	0.166	0.075	EETHC2E102C_	F	U	C		
	30 x 40	2.20	3.08	0.166	0.075	EETHC2E102D_	A	(No suffix)	J		
	35 x 30	2.20	3.08	0.166	0.075	EETHC2E102E_	A	(No suffix)	J		
1200	30 x 45	2.30	3.22	0.138	0.062	EETHC2E122D_	A	(No suffix)	J		
	35 x 35	2.30	3.22	0.138	0.062	EETHC2E122E_	A	(No suffix)	J		
1500	35 x 45	2.50	3.50	0.111	0.050	EETHC2E152E_	A	(No suffix)	J		
1800	35 x 45	2.50	3.50	0.092	0.041	EETHC2E182E_	F	U	C		
	35 x 50	2.70	3.78	0.092	0.041	EETHC2E182E_	A	(No suffix)	J		

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HC Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})				20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz		10kHz~		120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
		120Hz	10kHz~	120Hz	20kHz						
350 VDC Working, 400 VDC Surge											
120	22 x 25	0.75	1.05	1.382	0.622	EETHC2V121B_	A	(No suffix)	J		
150	22 x 30	0.82	1.15	1.105	0.497	EETHC2V151B_	A	(No suffix)	J		
180	22 x 30	0.90	1.26	0.921	0.414	EETHC2V181B_	A	(No suffix)	J		
	25 x 25	0.90	1.26	0.921	0.414	EETHC2V181C_	A	(No suffix)	J		
220	22 x 35	1.00	1.40	0.754	0.339	EETHC2V221B_	A	(No suffix)	J		
	25 x 30	1.00	1.40	0.754	0.339	EETHC2V221C_	A	(No suffix)	J		
270	25 x 35	1.10	1.54	0.614	0.276	EETHC2V271C_	A	(No suffix)	J		
	30 x 25	1.10	1.54	0.614	0.276	EETHC2V271D_	A	(No suffix)	J		
330	25 x 40	1.20	1.68	0.502	0.226	EETHC2V331C_	A	(No suffix)	J		
	30 x 30	1.20	1.68	0.502	0.226	EETHC2V331D_	A	(No suffix)	J		
390	25 x 45	1.30	1.82	0.425	0.191	EETHC2V391C_	A	(No suffix)	J		
	30 x 35	1.30	1.82	0.425	0.191	EETHC2V391D_	A	(No suffix)	J		
470	25 x 50	1.40	1.96	0.353	0.159	EETHC2V471C_	A	(No suffix)	J		
	35 x 30	1.40	1.96	0.353	0.159	EETHC2V471E_	A	(No suffix)	J		
560	30 x 45	1.50	2.10	0.296	0.133	EETHC2V561D_	A	(No suffix)	J		
	35 x 35	1.50	2.10	0.296	0.133	EETHC2V561E_	A	(No suffix)	J		
680	30 x 50	1.70	2.38	0.244	0.110	EETHC2V681D_	A	(No suffix)	J		
	35 x 40	1.70	2.38	0.244	0.110	EETHC2V681E_	A	(No suffix)	J		
820	35 x 45	1.90	2.66	0.202	0.091	EETHC2V821E_	A	(No suffix)	J		
400 VDC Working, 450 VDC Surge											
100	22 x 25	0.70	0.98	1.824	0.821	EETHC2G101B_	A	(No suffix)	J		
120	22 x 30	0.75	1.05	1.520	0.684	EETHC2G121B_	A	(No suffix)	J		
150	22 x 30	0.88	1.23	1.216	0.547	EETHC2G151B_	A	(No suffix)	J		
180	22 x 35	0.95	1.33	1.013	0.456	EETHC2G181B_	A	(No suffix)	J		
	25 x 30	0.95	1.33	1.013	0.456	EETHC2G181C_	A	(No suffix)	J		
220	22 x 40	1.00	1.40	0.829	0.373	EETHC2G221B_	F	U	C		
	22 x 45	1.10	1.54	0.829	0.373	EETHC2G221B_	A	(No suffix)	J		
	25 x 35	1.10	1.54	0.829	0.373	EETHC2G221C_	A	(No suffix)	J		
	30 x 25	1.10	1.54	0.829	0.373	EETHC2G221D_	A	(No suffix)	J		
270	22 x 45	1.10	1.54	0.675	0.304	EETHC2G271B_	F	U	C		
	22 x 50	1.22	1.71	0.675	0.304	EETHC2G271B_	A	(No suffix)	J		
	25 x 40	1.22	1.71	0.675	0.304	EETHC2G271C_	A	(No suffix)	J		
	30 x 30	1.22	1.71	0.675	0.304	EETHC2G271D_	A	(No suffix)	J		
	35 x 25	1.22	1.71	0.675	0.304	EETHC2G271E_	A	(No suffix)	J		
330	25 x 45	1.44	2.02	0.553	0.249	EETHC2G331C_	A	(No suffix)	J		
	30 x 35	1.44	2.02	0.553	0.249	EETHC2G331D_	A	(No suffix)	J		
	35 x 30	1.44	2.02	0.553	0.249	EETHC2G331E_	A	(No suffix)	J		
390	25 x 50	1.55	2.17	0.468	0.210	EETHC2G391C_	A	(No suffix)	J		
	30 x 35	1.40	1.96	0.468	0.210	EETHC2G391D_	F	U	C		
	30 x 40	1.55	2.17	0.468	0.210	EETHC2G391D_	A	(No suffix)	J		
	35 x 30	1.55	2.17	0.468	0.210	EETHC2G391E_	A	(No suffix)	J		
470	30 x 45	1.68	2.35	0.388	0.175	EETHC2G471D_	A	(No suffix)	J		
	35 x 35	1.68	2.35	0.388	0.175	EETHC2G471E_	A	(No suffix)	J		
560	30 x 50	1.90	2.66	0.326	0.147	EETHC2G561D_	A	(No suffix)	J		
	35 x 40	1.90	2.66	0.326	0.147	EETHC2G561E_	A	(No suffix)	J		
680	35 x 45	2.12	2.97	0.268	0.121	EETHC2G681E_	A	(No suffix)	J		
820	35 x 50	2.30	3.22	0.202	0.091	EETHC2G821E_	A	(No suffix)	J		
420 VDC Working, 470 VDC Surge											
120	22 x 30	0.74	1.04	1.520	0.684	EETHC2S121B_	A	(No suffix)	J		
	25 x 25	0.74	1.04	1.520	0.684	EETHC2S121C_	A	(No suffix)	J		
150	22 x 35	0.84	1.18	1.216	0.547	EETHC2S151B_	A	(No suffix)	J		
180	22 x 40	0.91	1.27	1.103	0.456	EETHC2S181B_	A	(No suffix)	J		
	25 x 30	0.91	1.27	1.103	0.456	EETHC2S181C_	A	(No suffix)	J		
220	22 x 45	1.05	1.47	0.829	0.373	EETHC2S221B_	A	(No suffix)	J		
	25 x 35	1.05	1.47	0.829	0.373	EETHC2S221C_	A	(No suffix)	J		
	30 x 25	1.05	1.47	0.829	0.373	EETHC2S221D_	A	(No suffix)	J		
270	22 x 50	1.20	1.68	0.675	0.304	EETHC2S271B_	A	(No suffix)	J		
	25 x 40	1.20	1.68	0.675	0.304	EETHC2S271C_	A	(No suffix)	J		
	30 x 30	1.20	1.68	0.675	0.304	EETHC2S271D_	A	(No suffix)	J		
	35 x 25	1.20	1.68	0.675	0.304	EETHC2S271E_	A	(No suffix)	J		
330	25 x 50	1.42	1.99	0.553	0.249	EETHC2S331C_	A	(No suffix)	J		

TS-HC Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number	Part Number Suffix Slewing Options		
		120Hz	10kHz~	120Hz	20kHz		PVC with Top Plate	PVC without Top Plate	PET without Top Plate
		420 VDC Working, 470 VDC Surge (continued)							
330	30 x 35	1.42	1.99	0.553	0.249	EETHC2S331D_	A	(No suffix)	J
	35 x 35	1.42	1.99	0.553	0.249	EETHC2S331E_	A	(No suffix)	J
390	30 x 40	1.55	2.17	0.468	0.210	EETHC2S391D_	A	(No suffix)	J
	35 x 35	1.55	2.17	0.468	0.210	EETHC2S391E_	A	(No suffix)	J
470	30 x 45	1.71	2.39	0.388	0.175	EETHC2S471D_	A	(No suffix)	J
	35 x 35	1.71	2.39	0.388	0.175	EETHC2S471E_	A	(No suffix)	J
560	30 x 50	1.90	2.66	0.326	0.147	EETHC2S561D_	A	(No suffix)	J
	35 x 45	1.90	2.66	0.326	0.147	EETHC2S561E_	A	(No suffix)	J
680	35 x 50	2.10	2.94	0.268	0.121	EETHC2S681E_	A	(No suffix)	J
450 VDC Working, 500 VDC Surge									
100	22 x 30	0.64	0.90	1.824	0.821	EETHC2W101B_	A	(No suffix)	J
	25 x 25	0.64	0.90	1.824	0.821	EETHC2W101C_	A	(No suffix)	J
120	22 x 35	0.72	1.01	1.520	0.684	EETHC2W121B_	A	(No suffix)	J
	25 x 30	0.72	1.01	1.520	0.684	EETHC2W121C_	A	(No suffix)	J
150	22 x 40	0.79	1.11	1.216	0.547	EETHC2W151B_	A	(No suffix)	J
	25 x 30	0.79	1.11	1.216	0.547	EETHC2W151C_	A	(No suffix)	J
	30 x 25	0.79	1.11	1.216	0.547	EETHC2W151D_	A	(No suffix)	J
180	22 x 45	0.87	1.22	1.013	0.456	EETHC2W181B_	A	(No suffix)	J
	25 x 35	0.79	1.11	1.013	0.456	EETHC2W181C_	F	U	C
	25 x 40	0.87	1.22	1.013	0.456	EETHC2W181C_	A	(No suffix)	J
	30 x 30	0.87	1.22	1.013	0.456	EETHC2W181D_	A	(No suffix)	J
220	22 x 50	0.90	1.26	0.829	0.373	EETHC2W221B_	A	(No suffix)	J
	25 x 45	1.00	1.40	0.829	0.373	EETHC2W221C_	A	(No suffix)	J
	30 x 30	1.00	1.40	0.829	0.373	EETHC2W221D_	A	(No suffix)	J
	35 x 25	1.00	1.40	0.829	0.373	EETHC2W221E_	A	(No suffix)	J
270	25 x 50	1.19	1.67	0.675	0.304	EETHC2W271C_	A	(No suffix)	J
	30 x 35	1.07	1.50	0.675	0.304	EETHC2W271D_	F	U	C
	30 x 40	1.19	1.67	0.675	0.304	EETHC2W271D_	A	(No suffix)	J
	35 x 30	1.19	1.67	0.675	0.304	EETHC2W271E_	A	(No suffix)	J
330	30 x 40	1.24	1.74	0.553	0.249	EETHC2W331D_	F	U	C
	30 x 45	1.38	1.93	0.553	0.249	EETHC2W331D_	A	(No suffix)	J
	35 x 35	1.38	1.93	0.553	0.249	EETHC2W331E_	A	(No suffix)	J
390	30 x 45	1.39	1.95	0.468	0.210	EETHC2W391D_	F	U	C
	30 x 50	1.55	2.17	0.468	0.210	EETHC2W391D_	A	(No suffix)	J
	35 x 40	1.55	2.17	0.468	0.210	EETHC2W391E_	A	(No suffix)	J
470	35 x 45	1.74	2.44	0.388	0.175	EETHC2W471E_	A	(No suffix)	J

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HB Series 105°C, 3000 hours

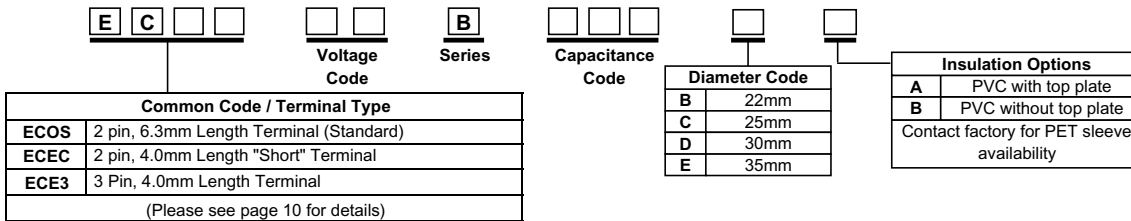
- Compact size (20 ~ 25% smaller than TS-HA series)
- 2 and 3 pin versions available
- Long 3000 hour life at 105°C with high ripple current capability
- Can vent construction



Rated Working Voltage:	160 ~ 250 VDC	385 ~ 450 VDC											
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C											
Nominal Capacitance:	330 ~ 2700µF (±20%)	82 ~ 560µF (±20%)											
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:	160 ~ 450											
	Max. D.F. (%):	15											
Leakage Current:	3√CV (µA) max. after 5 minutes; C = Capacitance in µF, V = WV												
Ripple Current Multipliers:	Ripple Current Frequency Factors			Ripple Current Ambient Temperature Factors*									
	Frequency(Hz):	50	60	100~120	500	1k	10k~	Ambient Temperature:	105°C	85°C	70°C	60°C	≤45°C
	Multiplier:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier:	1.0	1.7	2.0	2.2	2.35
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 6)												

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

Part Number System



TS-HB Standard Ratings (part numbers shown with 2 pins, 6.3mm length terminal, and top vinyl plate)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number	Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz				120Hz	10kHz~	120Hz	20kHz	
160 VDC Working, 200 VDC Surge							200 VDC Working, 250 VDC Surge (continued)						
470	22 x 30	1.40	1.96	0.423	0.190	ECOS2CB471BA	1000	25 x 50	2.20	3.08	0.216	0.108	ECOS2DB102CA
560	22 x 35	1.50	2.10	0.355	0.160	ECOS2CB561BA		30 x 35	2.20	3.08	0.216	0.108	ECOS2DB102DA
680	22 x 40	1.70	2.38	0.293	0.132	ECOS2CB681BA		35 x 30	2.20	3.08	0.216	0.108	ECOS2DB102EA
	25 x 30	1.70	2.38	0.293	0.132	ECOS2CB681CA	1200	30 x 40	2.30	3.22	0.193	0.097	ECOS2DB122DA
820	22 x 45	2.00	2.80	0.243	0.109	ECOS2CB821BA		35 x 35	2.30	3.22	0.193	0.097	ECOS2DB122EA
	25 x 35	2.00	2.80	0.243	0.109	ECOS2CB821CA	1500	30 x 50	2.50	3.50	0.155	0.077	ECOS2DB152DA
1000	22 x 50	2.20	3.08	0.199	0.090	ECOS2CB102BA		35 x 40	2.50	3.50	0.155	0.077	ECOS2DB152EA
	25 x 40	2.20	3.08	0.199	0.090	ECOS2CB102CA	1800	35 x 45	2.70	3.78	0.129	0.077	ECOS2DB182EA
	30 x 30	2.20	3.08	0.199	0.090	ECOS2CB102DA	2200	35 x 50	2.90	4.06	0.105	0.063	ECOS2DB222EA
	35 x 25	2.20	3.08	0.199	0.090	ECOS2CB102EA	250 VDC Working, 300 VDC Surge						
1200	25 x 45	2.30	3.22	0.180	0.090	ECOS2CB122CA	180	22 x 25	0.90	1.26	0.921	0.461	ECOS2EB181BA
	30 x 35	2.30	3.22	0.180	0.090	ECOS2CB122DA	220	22 x 30	1.00	1.40	0.754	0.377	ECOS2EB221BA
	35 x 30	2.30	3.22	0.180	0.090	ECOS2CB122EA	270	22 x 35	1.10	1.54	0.614	0.307	ECOS2EB271BA
1500	30 x 40	2.50	3.50	0.144	0.072	ECOS2CB152DA	330	22 x 40	1.20	1.68	0.502	0.251	ECOS2EB331BA
	35 x 30	2.50	3.50	0.144	0.072	ECOS2CB152EA		25 x 30	1.20	1.68	0.502	0.251	ECOS2EB331CA
1800	30 x 45	2.70	3.78	0.129	0.064	ECOS2CB182DA	390	22 x 45	1.30	1.82	0.425	0.213	ECOS2EB391BA
	35 x 35	2.70	3.78	0.129	0.064	ECOS2CB182EA		30 x 25	1.30	1.82	0.425	0.213	ECOS2EB391DA
2200	35 x 45	2.90	4.06	0.105	0.063	ECOS2CB222EA	470	22 x 50	1.40	1.96	0.353	0.176	ECOS2EB471BA
2700	35 x 50	3.10	4.34	0.086	0.052	ECOS2CB272EA		25 x 40	1.40	1.96	0.353	0.176	ECOS2EB471CA
200 VDC Working, 250 VDC Surge								30 x 30	1.40	1.96	0.353	0.176	ECOS2EB471DA
390	22 x 30	1.30	1.82	0.510	0.230	ECOS2DB391BA	560	25 x 45	1.50	2.10	0.296	0.148	ECOS2EB561CA
	25 x 25	1.30	1.82	0.510	0.230	ECOS2DB391CA		35 x 25	1.50	2.10	0.296	0.148	ECOS2EB561EA
470	22 x 35	1.40	1.96	0.423	0.190	ECOS2DB471BA	680	25 x 50	1.70	2.38	0.244	0.134	ECOS2EB681CA
	25 x 30	1.40	1.96	0.423	0.190	ECOS2DB471CA		30 x 40	1.70	2.38	0.244	0.134	ECOS2EB681DA
560	22 x 40	1.50	2.10	0.355	0.160	ECOS2DB561BA		35 x 30	1.70	2.38	0.244	0.134	ECOS2EB681EA
	25 x 30	1.50	2.10	0.355	0.160	ECOS2DB561CA	820	30 x 45	2.00	2.80	0.202	0.111	ECOS2EB821DA
	30 x 25	1.50	2.10	0.355	0.160	ECOS2DB561DA		35 x 35	2.00	2.80	0.202	0.111	ECOS2EB821EA
680	22 x 45	1.70	2.38	0.293	0.132	ECOS2DB681BA	1000	30 x 50	2.20	3.08	0.199	0.109	ECOS2EB102DA
	25 x 35	1.70	2.38	0.293	0.132	ECOS2DB681CA		35 x 40	2.20	3.08	0.199	0.109	ECOS2EB102EA
820	25 x 45	2.00	2.80	0.263	0.118	ECOS2DB821CA	1200	35 x 45	2.30	3.22	0.166	0.099	ECOS2EB122EA
	30 x 30	2.00	2.80	0.263	0.118	ECOS2DB821DA	1500	35 x 50	2.50	3.50	0.144	0.093	ECOS2EB152EA
820	35 x 25	2.00	2.80	0.263	0.118	ECOS2DB821EA							

TS-HB Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
385 VDC Working, 435 VDC Surge						
82	22 x 30	0.64	0.90	2.022	0.809	ECOS2TB820BA
100	22 x 30	0.69	0.97	1.658	0.663	ECOS2TB101BA
	25 x 25	0.69	0.97	1.658	0.663	ECOS2TB101CA
120	22 x 35	0.75	1.05	1.382	0.553	ECOS2TB121BA
	25 x 30	0.75	1.05	1.382	0.553	ECOS2TB121CA
150	22 x 40	0.82	1.15	1.105	0.442	ECOS2TB151BA
	25 x 30	0.82	1.15	1.105	0.442	ECOS2TB151CA
	30 x 25	0.82	1.15	1.105	0.442	ECOS2TB151DA
180	22 x 45	0.95	1.33	0.921	0.368	ECOS2TB181BA
	25 x 35	0.95	1.33	0.921	0.368	ECOS2TB181CA
	30 x 30	0.95	1.33	0.921	0.368	ECOS2TB181DA
220	25 x 45	1.10	1.54	0.754	0.301	ECOS2TB221CA
	30 x 30	1.10	1.54	0.829	0.332	ECOS2TB221DA
	35 x 25	1.10	1.54	0.829	0.332	ECOS2TB221EA
270	25 x 50	1.20	1.68	0.675	0.270	ECOS2TB271CA
	35 x 30	1.20	1.68	0.675	0.270	ECOS2TB271EA
	35 x 30	1.20	1.68	0.675	0.270	ECOS2TB271EA
330	30 x 45	1.35	1.89	0.553	0.221	ECOS2TB331DA
	35 x 35	1.35	1.89	0.553	0.221	ECOS2TB331EA
390	30 x 50	1.55	2.17	0.510	0.204	ECOS2TB391DA
470	35 x 45	1.75	2.45	0.423	0.212	ECOS2TB471EA
560	35 x 50	1.80	2.52	0.355	0.178	ECOS2TB561EA
400 VDC Working, 450 VDC Surge						
82	22 x 30	0.64	0.90	2.022	0.708	ECOS2GB820BA
100	22 x 30	0.69	0.97	1.658	0.580	ECOS2GB101BA
	25 x 25	0.69	0.97	1.658	0.580	ECOS2GB101CA
120	22 x 35	0.75	1.05	1.382	0.484	ECOS2GB121BA
	25 x 30	0.75	1.05	1.382	0.484	ECOS2GB121CA
150	22 x 40	0.82	1.15	1.105	0.387	ECOS2GB151BA
	25 x 30	0.82	1.15	1.105	0.387	ECOS2GB151CA
	30 x 25	0.82	1.15	1.105	0.387	ECOS2GB151DA
180	22 x 45	0.95	1.33	0.921	0.322	ECOS2GB181BA
	25 x 35	0.95	1.33	0.921	0.322	ECOS2GB181CA
	30 x 30	0.95	1.33	0.921	0.322	ECOS2GB181DA
220	25 x 45	1.10	1.54	0.754	0.264	ECOS2GB221CA
	30 x 30	1.10	1.54	0.754	0.264	ECOS2GB221DA
	35 x 25	1.10	1.54	0.754	0.264	ECOS2GB221EA
270	25 x 50	1.20	1.68	0.614	0.215	ECOS2GB271CA
	30 x 35	1.20	1.68	0.614	0.215	ECOS2GB271DA
	35 x 30	1.20	1.68	0.614	0.215	ECOS2GB271EA
330	30 x 45	1.35	1.89	0.502	0.201	ECOS2GB331DA
	35 x 35	1.35	1.89	0.502	0.201	ECOS2GB331EA
390	30 x 50	1.55	2.17	0.425	0.170	ECOS2GB391DA
	35 x 40	1.55	2.17	0.425	0.170	ECOS2GB391EA
470	35 x 45	1.75	2.45	0.353	0.141	ECOS2GB471EA
560	35 x 50	1.80	2.52	0.296	0.118	ECOS2GB561EA
420 VDC Working, 470 VDC Surge						
100	22 x 30	0.64	0.90	1.824	0.821	ECOS2SB101BA
	25 x 25	0.64	0.90	1.824	0.821	ECOS2SB101CA
120	22 x 35	0.72	1.01	1.520	0.684	ECOS2SB121BA
	25 x 30	0.72	1.01	1.520	0.684	ECOS2SB121CA
150	22 x 40	0.79	1.11	1.216	0.547	ECOS2SB151BA
	25 x 30	0.79	1.11	1.216	0.547	ECOS2SB151CA
	30 x 25	0.79	1.11	1.216	0.547	ECOS2SB151DA
180	22 x 45	0.87	1.22	1.013	0.456	ECOS2SB181BA
	25 x 40	0.87	1.22	1.013	0.456	ECOS2SB181CA
	30 x 30	0.87	1.22	1.013	0.456	ECOS2SB181DA
220	25 x 45	1.00	1.40	0.829	0.373	ECOS2SB221CA
	30 x 30	1.00	1.40	0.829	0.373	ECOS2SB221DA
	35 x 25	1.00	1.40	0.829	0.373	ECOS2SB221EA
270	25 x 50	1.19	1.67	0.675	0.304	ECOS2SB271CA
	30 x 40	1.19	1.67	0.675	0.304	ECOS2SB271DA
	35 x 30	1.19	1.67	0.675	0.304	ECOS2SB271EA
330	30 x 45	1.38	1.93	0.553	0.249	ECOS2SB331DA
	35 x 35	1.38	1.93	0.553	0.249	ECOS2SB331EA
390	30 x 50	1.55	2.17	0.468	0.210	ECOS2SB391DA
	35 x 40	1.55	2.17	0.468	0.210	ECOS2SB391EA
470	35 x 45	1.74	2.44	0.388	0.175	ECOS2SB471EA
560	35 x 50	1.90	2.66	0.326	0.147	ECOS2SB561EA

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
450 VDC Working, 500 VDC Surge (continued)						
82	22 x 30	0.56	0.78	2.022	0.708	ECOS2WB820BA
	25 x 25	0.56	0.78	2.022	0.708	ECOS2WB820CA
100	22 x 35	0.64	0.90	1.658	0.580	ECOS2WB101BA
	25 x 30	0.64	0.90	1.658	0.580	ECOS2WB101CA
120	22 x 40	0.72	1.01	1.382	0.484	ECOS2WB121BA
	25 x 35	0.72	1.01	1.382	0.484	ECOS2WB121CA
	30 x 25	0.72	1.01	1.382	0.484	ECOS2WB121DA
150	22 x 50	0.79	1.11	1.105	0.387	ECOS2WB151BA
	25 x 40	0.79	1.11	1.105	0.387	ECOS2WB151CA
	30 x 30	0.79	1.11	1.105	0.387	ECOS2WB151DA
180	25 x 45	0.87	1.22	0.921	0.322	ECOS2WB181CA
	30 x 35	0.87	1.22	0.921	0.322	ECOS2WB181DA
	30 x 35	0.87	1.22	0.921	0.322	ECOS2WB181DA
220	25 x 50	1.00	1.40	0.754	0.264	ECOS2WB221CA
	30 x 40	1.00	1.40	0.754	0.264	ECOS2WB221DA
	35 x 30	1.00	1.40	0.754	0.264	ECOS2WB221EA
270	30 x 45	1.19	1.67	0.614	0.215	ECOS2WB271DA
	35 x 35	1.19	1.67	0.614	0.215	ECOS2WB271EA
330	30 x 50	1.38	1.93	0.502	0.176	ECOS2WB331DA
	35 x 40	1.38	1.93	0.502	0.176	ECOS2WB331EA
390	35 x 45	1.55	2.17	0.425	0.149	ECOS2WB391EA
	35 x 50	1.74	2.44	0.353	0.123	ECOS2WB471EA

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HA Series 105°C, 3000 hours*

- High ripple current capability
- 20mm lengths for low profile applications
- 2 and 3 pin versions available



Rated Working Voltage:	10 ~ 250 VDC	385 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	68 ~ 82000µF (±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: $\frac{\text{(rated cap. } \mu\text{F)} - 33000}{1000}$		
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~
	10-100WV:	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**		
Ambient Temperature: 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 6) *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						
Common Code / Terminal Type				Voltage Code		Series		Capacitance Code		Case Diameter	
ECOS	2 pin, 6.3mm Length Terminal (Standard)									Insulation Options	
ECEC	2 pin, 4.0mm Length "Short" Terminal									A PVC with top plate	
ECE3	3 Pin, 4.0mm Length Terminal									B PVC without top plate	
(Please see page 10 for details)											
20mm length											
L PVC with top plate											
G PVC without top plate											

TS-HA Standard Ratings (part numbers shown with 2 pins, 6.3mm length terminal, and top vinyl plate)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
10 VDC Working, 13 VDC Surge						
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
	25 x 25	2.30	2.65	0.053	0.045	ECOS1AA153CA
18000	22 x 40	2.40	2.76	0.044	0.038	ECOS1AA183BA
	25 x 30	2.40	2.76	0.044	0.038	ECOS1AA183CA
22000	22 x 45	2.60	2.99	0.038	0.032	ECOS1AA223BA
	25 x 35	2.60	2.99	0.038	0.032	ECOS1AA223CA
	30 x 25	2.60	2.99	0.038	0.032	ECOS1AA223DA
27000	22 x 50	3.10	3.57	0.033	0.028	ECOS1AA273BA
	25 x 40	3.10	3.57	0.033	0.028	ECOS1AA273CA
	30 x 30	3.10	3.57	0.033	0.028	ECOS1AA273DA
	35 x 25	3.10	3.57	0.033	0.028	ECOS1AA273EA
33000	25 x 45	3.40	3.91	0.027	0.023	ECOS1AA333CA
	30 x 35	3.40	3.91	0.027	0.023	ECOS1AA333DA
	35 x 30	3.40	3.91	0.027	0.023	ECOS1AA333EA
39000	25 x 50	3.70	4.26	0.025	0.021	ECOS1AA393CA
	30 x 40	3.70	4.26	0.025	0.021	ECOS1AA393DA
	35 x 30	3.70	4.26	0.025	0.021	ECOS1AA393EA
47000	30 x 45	4.20	4.83	0.023	0.020	ECOS1AA473DA
	35 x 35	4.20	4.83	0.023	0.020	ECOS1AA473EA
56000	30 x 50	5.00	5.75	0.022	0.019	ECOS1AA563DA
	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
16 VDC Working, 20 VDC Surge						
3300	22 x 20	1.30	1.50	0.216	0.173	ECOS1CA332BL
	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
	25 x 20	1.60	1.84	0.152	0.121	ECOS1CA472CL
6800	22 x 25	2.20	2.53	0.085	0.068	ECOS1CA682BA
	30 x 20	1.80	2.07	0.105	0.084	ECOS1CA682DL
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
	25 x 25	2.60	2.99	0.066	0.053	ECOS1CA103CA
16 VDC Working, 20 VDC Surge (continued)						
10000	35 x 20	2.40	2.76	0.071	0.057	ECOS1CA103EL
12000	22 x 35	2.90	3.34	0.055	0.044	ECOS1CA123BA
	25 x 30	2.90	3.34	0.055	0.044	ECOS1CA123CA
	30 x 25	2.90	3.34	0.055	0.044	ECOS1CA123DA
15000	22 x 40	3.20	3.68	0.046	0.037	ECOS1CA153BA
	25 x 35	3.20	3.68	0.046	0.037	ECOS1CA153CA
	30 x 30	3.20	3.68	0.046	0.037	ECOS1CA153DA
18000	22 x 45	3.50	4.03	0.040	0.034	ECOS1CA183BA
	25 x 40	3.50	4.03	0.040	0.034	ECOS1CA183CA
	30 x 30	3.50	4.03	0.040	0.034	ECOS1CA183DA
	35 x 25	3.50	4.03	0.040	0.034	ECOS1CA183EA
22000	25 x 45	3.80	4.37	0.033	0.028	ECOS1CA223CA
	30 x 35	3.80	4.37	0.033	0.028	ECOS1CA223DA
	35 x 30	3.80	4.37	0.033	0.028	ECOS1CA223EA
	27000	25 x 50	4.20	4.83	0.028	0.025
	30 x 40	4.20	4.83	0.028	0.025	ECOS1CA273DA
	35 x 30	4.20	4.83	0.028	0.025	ECOS1CA273EA
33000	30 x 45	4.70	5.41	0.023	0.020	ECOS1CA333DA
	35 x 35	4.70	5.41	0.023	0.020	ECOS1CA333EA
39000	30 x 50	5.10	5.87	0.022	0.020	ECOS1CA393DA
	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
25 VDC Working, 32 VDC Surge						
2200	22 x 20	1.30	1.50	0.241	0.181	ECOS1EA222BL
	22 x 25	1.30	1.50	0.241	0.181	ECOS1EA222BA
3300	22 x 25	1.62	1.86	0.161	0.121	ECOS1EA332BA
	25 x 20	1.60	1.84	0.161	0.121	ECOS1EA332CL
4700	22 x 25	2.00	2.30	0.106	0.079	ECOS1EA472BA
	30 x 20	1.80	2.07	0.113	0.085	ECOS1EA472DL
5600	22 x 30	2.20	2.53	0.089	0.067	ECOS1EA562BA
	6800	22 x 30	2.40	2.76	0.073	0.055
	25 x 25	2.40	2.76	0.073	0.055	ECOS1EA682CA
	35 x 20	2.30	2.65	0.080	0.060	ECOS1EA682EL
8200	22 x 35	2.70	3.11	0.061	0.045	ECOS1EA822BA
	25 x 30	2.70	3.11	0.061	0.045	ECOS1EA822CA

TS-HA Standard Ratings (continued)

Table with columns: Cap. (µF), Size (mm) D x L, Max 105°C R.C. (A_rms), 20°C ESR (Ω, max.), Panasonic Part Number. Contains ratings for 25 VDC Working, 32 VDC Surge, 35 VDC Working, 44 VDC Surge, 50 VDC Working, 63 VDC Surge, and 50 VDC Working, 63 VDC Surge. Rows include capacitor values like 8200, 10000, 12000, 15000, 18000, 22000, 27000, 33000 and various sizes.

Table with columns: Cap. (µF), Size (mm) D x L, Max 105°C R.C. (A_rms), 20°C ESR (Ω, max.), Panasonic Part Number. Contains ratings for 50 VDC Working, 63 VDC Surge, 63 VDC Working, 79 VDC Surge, 80 VDC Working, 100 VDC Surge, and 100 VDC Working, 125 VDC Surge. Rows include capacitor values like 6800, 8200, 10000, 12000, 15000, 18000, 22000, 27000, 33000, 39000, 47000, 56000, 68000, 82000, 100000 and various sizes.

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-HA Standard Ratings (continued)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number	Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz				120Hz	20kHz			
100 VDC Working, 125 VDC Surge (continued)							200 VDC Working, 250 VDC Surge (continued)						
470	22 x 25 25 x 20	0.92 1.00	1.38 1.50	0.388 0.459	0.233 0.275	ECOS2AA471BA ECOS2AA471CL	560	22 x 45 25 x 35 30 x 30	1.50 1.50 1.50	2.10 2.10 2.10	0.296 0.296 0.296	0.133 0.133 0.133	ECOS2DA561BA ECOS2DA561CA ECOS2DA561DA
560	22 x 25	1.10	1.65	0.296	0.178	ECOS2AA561BA	680	25 x 40 30 x 30	1.70 1.70	2.38 2.38	0.244 0.244	0.110 0.110	ECOS2DA681CA ECOS2DA681DA
680	30 x 20	1.10	1.65	0.317	0.190	ECOS2AA681DL	820	25 x 50 30 x 35 35 x 30	2.00 2.00 2.00	2.80 2.80 2.80	0.222 0.222 0.222	0.111 0.111 0.111	ECOS2DA821CA ECOS2DA821DA ECOS2DA821EA
820	22 x 30 25 x 25	1.40 1.40	2.10 2.10	0.202 0.202	0.121 0.121	ECOS2AA821BA ECOS2AA821CA	1000	30 x 45 35 x 35	2.20 2.20	3.08 3.08	0.199 0.199	0.099 0.099	ECOS2DA102DA ECOS2DA102EA
1000	22 x 35 25 x 30 35 x 20	1.70 1.70 1.20	2.55 2.55 1.80	0.182 0.182 0.216	0.109 0.109 0.129	ECOS2AA102BA ECOS2AA102CA ECOS2AA102EL	1200	30 x 50 35 x 40	2.30 2.30	3.22 3.22	0.166 0.166	0.083 0.083	ECOS2DA122DA ECOS2DA122EA
1200	22 x 40 25 x 35 30 x 25	1.80 1.80 1.80	2.70 2.70 2.70	0.152 0.152 0.152	0.091 0.091 0.091	ECOS2AA122BA ECOS2AA122CA ECOS2AA122DA	1500	35 x 50	2.50	3.50	0.144	0.072	ECOS2DA152EA
1500	22 x 45 25 x 40 30 x 30 35 x 25	2.10 2.10 2.10 2.10	3.15 3.15 3.15 3.15	0.122 0.122 0.122 0.122	0.073 0.079 0.079 0.079	ECOS2AA152BA ECOS2AA152CA ECOS2AA152DA ECOS2AA152EA	250 VDC Working, 300 VDC Surge						
1800	25 x 45 30 x 35 35 x 30	2.30 2.30 2.30	3.45 3.45 3.45	0.111 0.111 0.111	0.072 0.072 0.072	ECOS2AA182CA ECOS2AA182DA ECOS2AA182EA	68	22 x 20 22 x 25	0.40 0.40	0.56 0.56	2.926 2.438	1.463 1.219	ECOS2EA680BL ECOS2EA680BA
2200	25 x 50 30 x 40 35 x 30	2.60 2.60 2.60	3.90 3.90 3.90	0.090 0.090 0.090	0.059 0.059 0.059	ECOS2AA222CA ECOS2AA222DA ECOS2AA222EA	100	22 x 25 25 x 20	0.55 0.50	0.77 0.70	1.658 1.989	0.829 0.995	ECOS2EA101BA ECOS2EA101CL
2700	30 x 45 35 x 35	2.90 2.90	4.35 4.35	0.080 0.080	0.052 0.052	ECOS2AA272DA ECOS2AA272EA	150	22 x 25 30 x 20	0.75 0.65	1.05 0.91	1.105 1.326	0.553 0.663	ECOS2EA151BA ECOS2EA151DL
3300	30 x 50 35 x 40	3.20 3.20	4.80 4.80	0.075 0.075	0.053 0.053	ECOS2AA332DA ECOS2AA332EA	180	22 x 30 25 x 25	0.90 0.90	1.26 1.26	0.921 0.921	0.461 0.461	ECOS2EA181BA ECOS2EA181CA
3900	35 x 45	3.60	5.40	0.064	0.045	ECOS2AA392EA	220	22 x 30 25 x 25 35 x 20	1.00 1.00 0.87	1.40 1.40 1.22	0.754 0.754 0.904	0.377 0.377 0.452	ECOS2EA221BA ECOS2EA221CA ECOS2EA221EL
4700	35 x 50	3.80	5.70	0.053	0.040	ECOS2AA472EA	270	22 x 35 25 x 30 30 x 25	1.10 1.10 1.10	1.54 1.54 1.54	0.614 0.614 0.614	0.307 0.307 0.307	ECOS2EA271BA ECOS2EA271CA ECOS2EA271DA
160 VDC Working, 200 VDC Surge							330	22 x 40 25 x 35 30 x 25	1.20 1.20 1.20	1.68 1.68 1.68	0.502 0.502 0.502	0.251 0.251 0.251	ECOS2EA331BA ECOS2EA331CA ECOS2EA331DA
150	22 x 20 22 x 25	0.55 0.61	0.77 0.85	1.437 1.216	0.647 0.547	ECOS2CA151BL ECOS2CA151BA	390	22 x 45 25 x 35 30 x 30	1.30 1.30 1.30	1.82 1.82 1.82	0.425 0.425 0.425	0.213 0.213 0.213	ECOS2EA391BA ECOS2EA391CA ECOS2EA391DA
220	22 x 25 25 x 20	0.90 0.75	1.26 1.05	0.829 0.980	0.373 0.441	ECOS2CA221BA ECOS2CA221CL	470	25 x 45 30 x 35 35 x 30	1.40 1.40 1.40	1.96 1.96 1.96	0.353 0.353 0.353	0.176 0.176 0.176	ECOS2EA471CA ECOS2EA471DA ECOS2EA471EA
270	22 x 25	1.10	1.54	0.675	0.304	ECOS2CA271BA	560	25 x 50 30 x 35 35 x 30	1.50 1.50 1.50	2.10 2.10 2.10	0.296 0.296 0.296	0.148 0.148 0.148	ECOS2EA561BA ECOS2EA561DA ECOS2EA561EA
330	22 x 30 30 x 20	1.20 1.00	1.68 1.40	0.553 0.553	0.249 0.249	ECOS2CA331BA ECOS2CA331DL	680	30 x 45 35 x 35	1.70 1.70	2.38 2.38	0.244 0.244	0.122 0.122	ECOS2EA681DA ECOS2EA681EA
390	22 x 30 25 x 25	1.30 1.30	1.82 1.82	0.553 0.553	0.249 0.249	ECOS2CA391BA ECOS2CA391CA	820	30 x 50 35 x 40	2.00 2.00	2.80 2.80	0.202 0.202	0.101 0.101	ECOS2EA821DA ECOS2EA821EA
470	22 x 35 25 x 30 35 x 20	1.40 1.40 1.15	1.96 1.96 1.61	0.529 0.459 0.459	0.238 0.206 0.206	ECOS2CA471BA ECOS2CA471CA ECOS2CA471EL	1000	35 x 45 35 x 50	2.20 2.30	3.08 3.22	0.199 0.166	0.099 0.083	ECOS2EA102EA ECOS2EA122EA
560	22 x 40 25 x 30 30 x 25	1.50 1.50 1.50	2.10 2.10 2.10	0.385 0.385 0.385	0.173 0.173 0.173	ECOS2CA561BA ECOS2CA561CA ECOS2CA561DA	385 VDC Working, 435 VDC Surge						
680	22 x 45 25 x 35 30 x 30	1.70 1.70 1.70	2.38 2.38 2.38	0.317 0.317 0.317	0.143 0.143 0.143	ECOS2CA681BA ECOS2CA681CA ECOS2CA681DA	33	22 x 20	0.20	0.28	5.024	1.758	ECOS2TA330BL
820	25 x 40 30 x 30	2.00 2.00	2.80 2.80	0.263 0.263	0.118 0.118	ECOS2CA821CA ECOS2CA821DA	47	25 x 20	0.25	0.35	3.527	1.235	ECOS2TA470CL
1000	25 x 45 30 x 35	2.20 2.20	3.08 3.08	0.216 0.216	0.108 0.108	ECOS2CA102CA ECOS2CA102DA	56	22 x 25	0.51	0.71	2.368	0.829	ECOS2TA560BA
1200	25 x 50 30 x 40	2.30 2.30	3.22 3.22	0.180 0.180	0.090 0.090	ECOS2CA122CA ECOS2CA122DA	68	22 x 30 25 x 25 30 x 20	0.56 0.56 0.35	0.78 0.78 0.49	1.950 1.950 2.438	0.683 0.683 0.853	ECOS2TA680BA ECOS2TA680CA ECOS2TA680DL
1500	30 x 45 35 x 35	2.50 2.50	3.50 3.50	0.166 0.166	0.083 0.083	ECOS2CA152DA ECOS2CA152EA	82	22 x 35 25 x 25	0.64 0.64	0.90 0.90	1.617 1.617	0.566 0.566	ECOS2TA820BA ECOS2TA820CA
1800	30 x 50 35 x 40	2.70 2.70	3.78 3.78	0.138 0.138	0.083 0.069	ECOS2CA182DA ECOS2CA182EA	100	22 x 35 25 x 30 35 x 20	0.69 0.69 0.67	0.97 0.97 0.66	1.326 1.326 1.658	0.464 0.464 0.580	ECOS2TA101BA ECOS2TA101CA ECOS2TA101EL
2200	35 x 50	2.90	4.06	0.113	0.057	ECOS2CA222EA	120	22 x 35 25 x 30	0.75 0.75	1.05 1.05	1.105 1.105	0.387 0.387	ECOS2TA121BA ECOS2TA121CA
200 VDC Working, 250 VDC Surge							150	22 x 50 25 x 40 30 x 30	0.82 0.82 0.82	1.15 1.15 1.15	0.884 0.884 0.884	0.309 0.309 0.309	ECOS2TA151BA ECOS2TA151CA ECOS2TA151DA
100	22 x 20 22 x 25	0.50 0.50	0.70 0.70	1.989 1.658	0.895 0.746	ECOS2DA101BL ECOS2DA101BA	180	25 x 45 30 x 35 35 x 25	0.95 0.95 0.95	1.33 1.33 1.33	0.737 0.737 0.737	0.258 0.258 0.258	ECOS2TA181CA ECOS2TA181DA ECOS2TA181EA
150	22 x 25 25 x 20	0.68 0.65	0.95 0.91	1.105 1.326	0.497 0.597	ECOS2DA151BA ECOS2DA151CL	220	25 x 50 30 x 40 35 x 30	1.10 1.10 1.10	1.54 1.54 1.54	0.603 0.603 0.603	0.211 0.211 0.211	ECOS2TA221CA ECOS2TA221DA ECOS2TA221EA
220	22 x 25 30 x 20	1.00 0.87	1.40 1.22	0.754 0.904	0.339 0.407	ECOS2DA221BA ECOS2DA221DL	270	30 x 45 35 x 35	1.20 1.20	1.68 1.68	0.491 0.491	0.172 0.172	ECOS2TA271DA ECOS2TA271EA
270	22 x 30 25 x 25	1.10 1.10	1.54 1.54	0.614 0.614	0.276 0.276	ECOS2DA271BA ECOS2DA271CA	330	30 x 50 35 x 40	1.35 1.35	1.89 1.89	0.402 0.402	0.161 0.161	ECOS2TA331DA ECOS2TA331EA
330	22 x 30 25 x 25 35 x 20	1.20 1.20 1.10	1.68 1.68 1.54	0.502 0.502 0.603	0.226 0.226 0.271	ECOS2DA331BA ECOS2DA331CA ECOS2DA331EL	390	35 x 45 35 x 50	1.55 1.75	2.17 2.45	0.340 0.282	0.136 0.127	ECOS2TA391EA ECOS2TA471EA
390	22 x 35 25 x 30 30 x 25	1.30 1.30 1.30	1.82 1.82 1.82	0.425 0.425 0.425	0.191 0.191 0.191	ECOS2DA391BA ECOS2DA391CA ECOS2DA391DA	470	35 x 50	1.75	2.45	0.282	0.127	ECOS2TA471EA
470	22 x 40 25 x 35 30 x 25	1.40 1.40 1.40	1.96 1.96 1.96	0.353 0.353 0.353	0.159 0.159 0.159	ECOS2DA471BA ECOS2DA471CA ECOS2DA471DA							

TS-HA Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
400 VDC Working, 450 VDC Surge						
33	22 x 20	0.20	0.28	5.024	1.758	ECOS2GA330BL
	22 x 25	0.30	0.42	4.521	1.582	ECOS2GA330BA
47	22 x 25	0.43	0.60	2.822	0.988	ECOS2GA470BA
	25 x 20	0.25	0.35	3.527	1.235	ECOS2GA470CL
56	22 x 25	0.51	0.71	2.368	0.829	ECOS2GA560BA
68	22 x 30	0.56	0.78	1.950	0.683	ECOS2GA680BA
	25 x 25	0.56	0.78	1.950	0.683	ECOS2GA680CA
	30 x 20	0.35	0.49	2.438	0.853	ECOS2GA680DL
82	22 x 35	0.64	0.90	1.617	0.566	ECOS2GA820BA
	25 x 25	0.64	0.90	1.617	0.566	ECOS2GA820CA
100	22 x 35	0.69	0.97	1.326	0.464	ECOS2GA101BA
	25 x 30	0.69	0.97	1.326	0.464	ECOS2GA101CA
	35 x 20	0.47	0.66	1.658	0.580	ECOS2GA101EL
120	22 x 40	0.75	1.05	1.105	0.387	ECOS2GA121BA
	25 x 35	0.75	1.05	1.105	0.387	ECOS2GA121CA
	30 x 25	0.75	1.05	1.105	0.387	ECOS2GA121DA
150	22 x 50	0.82	1.15	0.884	0.309	ECOS2GA151BA
	25 x 40	0.82	1.15	0.884	0.309	ECOS2GA151CA
	30 x 30	0.82	1.15	0.884	0.309	ECOS2GA151DA
180	25 x 45	0.95	1.33	0.737	0.258	ECOS2GA181CA
	30 x 35	0.95	1.33	0.737	0.258	ECOS2GA181DA
	35 x 25	0.95	1.33	0.737	0.258	ECOS2GA181EA
220	25 x 50	1.10	1.54	0.603	0.211	ECOS2GA221CA
	30 x 40	1.10	1.54	0.603	0.211	ECOS2GA221DA
	35 x 30	1.10	1.54	0.603	0.211	ECOS2GA221EA
270	30 x 45	1.20	1.68	0.491	0.172	ECOS2GA271DA
	35 x 35	1.20	1.68	0.491	0.172	ECOS2GA271EA
330	30 x 50	1.35	1.89	0.402	0.161	ECOS2GA331DA
	35 x 40	1.35	1.89	0.402	0.161	ECOS2GA331EA
390	35 x 45	1.55	2.17	0.340	0.136	ECOS2GA391EA
470	35 x 50	1.75	2.45	0.282	0.127	ECOS2GA471EA
450 VDC Working, 500 VDC Surge						
56	22 x 25	0.40	0.56	2.368	0.947	ECOS2WA560BA
68	22 x 30	0.50	0.70	1.950	0.780	ECOS2WA680BA
	25 x 25	0.50	0.70	1.950	0.780	ECOS2WA680CA
82	22 x 35	0.56	0.78	1.617	0.647	ECOS2WA820BA
100	22 x 40	0.64	0.90	1.326	0.531	ECOS2WA101BA
	25 x 30	0.64	0.90	1.326	0.531	ECOS2WA101CA
	30 x 25	0.64	0.90	1.326	0.531	ECOS2WA101DA
120	22 x 45	0.72	1.01	1.105	0.442	ECOS2WA121BA
	25 x 35	0.72	1.01	1.105	0.442	ECOS2WA121CA
150	22 x 50	0.79	1.11	0.884	0.354	ECOS2WA151BA
	25 x 40	0.79	1.11	0.884	0.354	ECOS2WA151CA
	30 x 30	0.79	1.11	0.884	0.354	ECOS2WA151DA
	35 x 25	0.79	1.11	0.884	0.354	ECOS2WA151EA
180	25 x 45	0.87	1.22	0.737	0.295	ECOS2WA181CA
	30 x 35	0.87	1.22	0.737	0.295	ECOS2WA181DA
220	25 x 50	1.00	1.40	0.678	0.271	ECOS2WA221CA
	30 x 40	1.00	1.40	0.678	0.271	ECOS2WA221DA
	35 x 30	1.00	1.40	0.678	0.271	ECOS2WA221EA
270	30 x 45	1.17	1.64	0.614	0.246	ECOS2WA271DA
	35 x 35	1.17	1.64	0.614	0.246	ECOS2WA271EA
330	30 x 50	1.38	1.93	0.502	0.201	ECOS2WA331DA
	35 x 40	1.38	1.93	0.502	0.201	ECOS2WA331EA
390	35 x 50	1.55	2.17	0.425	0.170	ECOS2WA391EA

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-ED Series 105°C, 3000 hours



- Highest ripple current capability for demanding inverter applications
- 2 and 3 pin versions available
- 3000 hour life at 105°C

Rated Working Voltage:	200 ~ 250 VDC	400 ~ 450 VDC																																			
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C																																			
Nominal Capacitance:	220~2200 µF	56 ~ 560µF																																			
Capacitance Tolerance:	± 20%																																				
Dissipation Factor (120Hz, 20°C):	15% maximum (120Hz, +20°C)																																				
Leakage Current:	3√CV (µA) max. after 5 minutes; C = Capacitance in µF, V = WV																																				
Ripple Current Multipliers:	<table border="1"> <thead> <tr> <th colspan="6">Ripple Current Frequency Factors</th> <th colspan="5">Ripple Current Ambient Temperature Factors*</th> </tr> <tr> <th>Frequency(Hz):</th> <th>50</th> <th>60</th> <th>100-120</th> <th>500</th> <th>1k</th> <th>10k~</th> <th colspan="5">Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C</th> </tr> <tr> <th>Multiplier:</th> <td>0.71</td> <td>0.78</td> <td>1.0</td> <td>1.2</td> <td>1.25</td> <td>1.4</td> <td colspan="5">Multiplier: 1.0 1.7 2.0 2.2 2.35</td> </tr> </thead> </table>		Ripple Current Frequency Factors						Ripple Current Ambient Temperature Factors*					Frequency(Hz):	50	60	100-120	500	1k	10k~	Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C					Multiplier:	0.71	0.78	1.0	1.2	1.25	1.4	Multiplier: 1.0 1.7 2.0 2.2 2.35				
Ripple Current Frequency Factors						Ripple Current Ambient Temperature Factors*																															
Frequency(Hz):	50	60	100-120	500	1k	10k~	Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C																														
Multiplier:	0.71	0.78	1.0	1.2	1.25	1.4	Multiplier: 1.0 1.7 2.0 2.2 2.35																														
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 6)																																				

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

Part Number System

E E T
Common Code

E D
Series Code

□ □
Voltage Code

□ □ □
Capacitance Code

Diameter	Diameter / Terminal Code		
	# of pins:	2	3
	pin length:	6.3mm	4.0mm
22mm		B	H
25mm		C	J
30mm		D	K
35mm		E	L

Insulation Options	
A	PVC with top plate
	PVC without top plate (no suffix)
J	PET sleeve without plate

TS-ED Standard Ratings (part numbers shown with 6.3mm length terminal and top vinyl plate)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
200 VDC Working, 250 VDC Surge						
270	22 x 25	1.42	2.03	0.553	0.249	EETED2D271BA
330	22 x 30	1.56	2.23	0.452	0.203	EETED2D331BA
390	22 x 30	1.71	2.44	0.383	0.172	EETED2D391BA
	25 x 25	1.71	2.44	0.383	0.172	EETED2D391CA
470	22 x 35	1.85	2.64	0.317	0.143	EETED2D471BA
	25 x 30	1.85	2.64	0.317	0.143	EETED2D471CA
560	22 x 40	2.14	3.05	0.266	0.120	EETED2D561BA
	25 x 30	2.14	3.05	0.266	0.120	EETED2D561CA
	30 x 25	2.14	3.05	0.266	0.120	EETED2D561DA
680	22 x 45	2.42	3.45	0.219	0.099	EETED2D681BA
	25 x 35	2.42	3.45	0.219	0.099	EETED2D681CA
	30 x 30	2.42	3.45	0.219	0.099	EETED2D681DA
820	22 x 50	2.63	3.76	0.182	0.082	EETED2D821BA
	25 x 40	2.63	3.76	0.182	0.082	EETED2D821CA
	30 x 30	2.63	3.76	0.182	0.082	EETED2D821DA
	35 x 25	2.63	3.76	0.182	0.091	EETED2D821EA
1000	25 x 45	2.84	4.06	0.149	0.067	EETED2D102CA
	30 x 35	2.84	4.06	0.149	0.067	EETED2D102DA
	35 x 30	2.84	4.06	0.149	0.067	EETED2D102EA
1200	30 x 40	3.13	4.47	0.124	0.062	EETED2D122DA
	35 x 35	3.13	4.47	0.124	0.062	EETED2D122EA
1500	30 x 50	3.56	5.08	0.099	0.050	EETED2D152DA
	35 x 40	3.56	5.08	0.099	0.050	EETED2D152EA
1800	35 x 45	3.84	5.48	0.083	0.041	EETED2D182EA
2200	35 x 50	4.12	5.89	0.068	0.033	EETED2D222EA
250 VDC Working, 300 VDC Surge						
220	22 x 30	1.28	1.83	0.678	0.305	EETED2E221BA
270	22 x 30	1.42	2.03	0.553	0.249	EETED2E271BA
	25 x 25	1.42	2.03	0.553	0.249	EETED2E271CA
330	22 x 35	1.64	2.34	0.452	0.203	EETED2E331BA
	25 x 30	1.56	2.23	0.452	0.203	EETED2E331CA
250 VDC Working, 300 VDC Surge (continued)						
390	22 x 40	1.72	2.45	0.383	0.172	EETED2E391BA
	25 x 30	1.71	2.44	0.383	0.172	EETED2E391CA
	30 x 25	1.71	2.44	0.383	0.172	EETED2E391DA
470	22 x 45	1.85	2.64	0.317	0.143	EETED2E471BA
	25 x 35	1.85	2.64	0.317	0.143	EETED2E471CA
	30 x 30	1.85	2.64	0.317	0.143	EETED2E471DA
560	25 x 40	2.14	3.05	0.266	0.120	EETED2E561CA
	30 x 30	2.14	3.05	0.266	0.120	EETED2E561DA
	35 x 25	2.14	3.05	0.266	0.133	EETED2E561EA
680	25 x 45	2.42	3.45	0.219	0.099	EETED2E681CA
	30 x 35	2.42	3.45	0.219	0.099	EETED2E681DA
	35 x 30	2.42	3.45	0.219	0.110	EETED2E681EA
820	30 x 40	2.63	3.76	0.182	0.082	EETED2E821DA
	35 x 35	2.63	3.76	0.182	0.091	EETED2E821EA
	1000	30 x 50	2.84	4.06	0.149	0.067
1200	35 x 45	3.13	4.47	0.124	0.062	EETED2E122EA
	1500	35 x 50	3.56	5.08	0.099	0.050
400 VDC Working, 450 VDC Surge						
82	22 x 25	0.80	1.14	1.617	0.728	EETED2G820BA
100	22 x 30	0.91	1.30	1.326	0.597	EETED2G101BA
	25 x 25	0.91	1.30	1.326	0.597	EETED2G101CA
120	22 x 35	1.02	1.46	1.105	0.497	EETED2G121BA
	25 x 30	1.02	1.46	1.105	0.497	EETED2G121CA
150	22 x 40	1.07	1.53	0.884	0.398	EETED2G151BA
	25 x 30	1.07	1.53	0.884	0.398	EETED2G151CA
	30 x 25	1.07	1.53	0.884	0.398	EETED2G151DA
180	22 x 45	1.12	1.60	0.737	0.332	EETED2G181BA
	25 x 35	1.12	1.60	0.737	0.332	EETED2G181CA
	30 x 30	1.12	1.60	0.737	0.332	EETED2G181DA
220	22 x 50	1.42	2.03	0.603	0.271	EETED2G221BA

TS-ED Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
400 VDC Working, 450 VDC Surge (continued)						
220	25 x 40	1.42	2.03	0.603	0.271	EETED2G221CA
	30 x 30	1.42	2.03	0.603	0.271	EETED2G221DA
	35 x 25	1.42	2.03	0.603	0.271	EETED2G221EA
270	25 x 45	1.56	2.23	0.491	0.221	EETED2G271CA
	30 x 35	1.56	2.23	0.491	0.221	EETED2G271DA
	35 x 30	1.56	2.23	0.491	0.221	EETED2G271EA
330	30 x 40	1.71	2.44	0.402	0.181	EETED2G331DA
	35 x 30	1.71	2.44	0.402	0.181	EETED2G331EA
390	30 x 45	1.85	2.64	0.340	0.153	EETED2G391DA
	35 x 35	1.85	2.64	0.340	0.153	EETED2G391EA
470	35 x 40	2.01	2.87	0.282	0.127	EETED2G471EA
560	35 x 45	2.35	3.36	0.237	0.107	EETED2G561EA
420 VDC Working, 470 VDC Surge						
68	22 x 25	1.08	0.95	1.950	0.878	EETED2S680BA
82	22 x 30	1.14	1.08	1.617	0.728	EETED2S820BA
	25 x 25	1.14	1.08	1.617	0.728	EETED2S820CA
100	22 x 30	1.30	1.14	1.326	0.597	EETED2S101BA
	25 x 25	1.30	1.14	1.326	0.597	EETED2S101CA
120	22 x 35	1.46	1.30	1.105	0.497	EETED2S121BA
	25 x 30	1.46	1.30	1.105	0.497	EETED2S121CA
150	22 x 40	1.53	1.46	0.884	0.398	EETED2S151BA
	25 x 35	1.53	1.46	0.884	0.398	EETED2S151CA
	30 x 25	1.53	1.46	0.884	0.398	EETED2S151DA
180	22 x 45	1.60	1.53	0.737	0.332	EETED2S181BA
	25 x 40	1.60	1.53	0.737	0.332	EETED2S181CA
	30 x 30	1.60	1.53	0.737	0.332	EETED2S181DA
	35 x 25	1.60	1.53	0.737	0.332	EETED2S181EA
220	25 x 45	2.03	1.60	0.603	0.271	EETED2S221CA
	30 x 35	2.03	1.60	0.603	0.271	EETED2S221DA
	35 x 30	2.03	1.60	0.603	0.271	EETED2S221EA
270	25 x 50	2.40	2.03	0.491	0.221	EETED2S271CA
	30 x 40	2.40	2.03	0.491	0.221	EETED2S271DA
	35 x 30	2.40	2.03	0.491	0.221	EETED2S271EA
330	30 x 45	2.54	2.45	0.402	0.181	EETED2S331DA
	35 x 35	2.54	2.45	0.402	0.181	EETED2S331EA
390	30 x 50	2.73	2.64	0.340	0.153	EETED2S391DA
	35 x 40	2.73	2.64	0.340	0.153	EETED2S391EA
470	35 x 45	3.18	2.82	0.282	0.127	EETED2S471EA
450 VDC Working, 500 VDC Surge						
56	22 x 25	0.67	0.95	2.368	1.066	EETED2W560BA
68	22 x 30	0.76	1.08	1.950	0.878	EETED2W680BA
	25 x 25	0.76	1.08	1.950	0.878	EETED2W680CA
82	22 x 30	0.80	1.14	1.617	0.728	EETED2W820BA
	25 x 25	0.80	1.14	1.617	0.728	EETED2W820CA
100	22 x 35	0.91	1.30	1.326	0.597	EETED2W101BA
	25 x 30	0.91	1.30	1.326	0.597	EETED2W101CA
120	22 x 40	1.02	1.46	1.105	0.497	EETED2W121BA
	25 x 35	1.02	1.46	1.105	0.497	EETED2W121CA
	30 x 25	1.02	1.46	1.105	0.497	EETED2W121DA
150	22 x 45	1.07	1.53	0.884	0.398	EETED2W151BA
	25 x 40	1.07	1.53	0.884	0.398	EETED2W151CA
	30 x 30	1.07	1.53	0.884	0.398	EETED2W151DA
	35 x 25	1.07	1.53	0.884	0.398	EETED2W151EA
180	22 x 50	1.12	1.60	0.737	0.332	EETED2W181BA
	25 x 40	1.12	1.60	0.737	0.332	EETED2W181CA
	30 x 30	1.12	1.60	0.737	0.332	EETED2W181DA
	35 x 25	1.12	1.60	0.737	0.332	EETED2W181EA
220	25 x 45	1.42	2.03	0.603	0.271	EETED2W221CA
	30 x 35	1.42	2.03	0.603	0.271	EETED2W221DA
	35 x 30	1.42	2.03	0.603	0.271	EETED2W221EA
270	30 x 40	1.72	2.45	0.491	0.221	EETED2W271DA
	35 x 35	1.72	2.45	0.491	0.221	EETED2W271EA
330	30 x 50	1.85	2.64	0.402	0.181	EETED2W331DA
	35 x 40	1.85	2.64	0.402	0.181	EETED2W331EA
390	35 x 40	1.97	2.82	0.340	0.153	EETED2W391EA
470	35 x 50	2.47	3.53	0.282	0.127	EETED2W471EA

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

TS-EE Series 105°C, 3000 hours

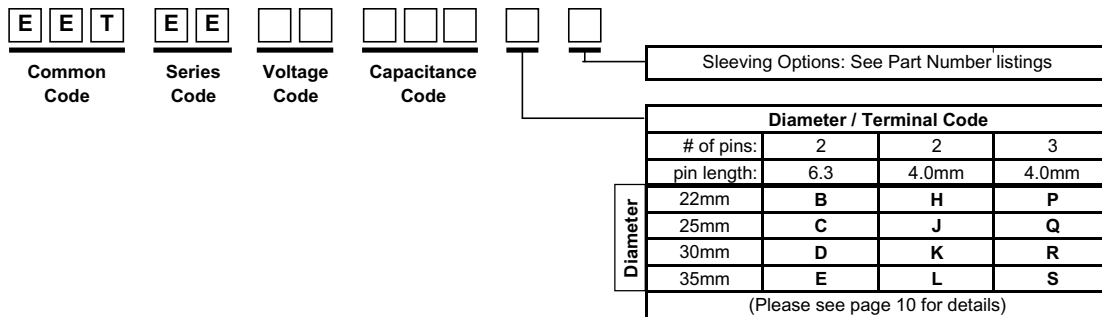
- Highest ripple current capability **NEW SERIES**
- 2 and 3 pin versions available
- PET Sleeve Option



Rated Working Voltage:	200 VDC								
Operating Temperature:	-40 ~ +105°C								
Nominal Capacitance:	300 ~ 1800µF								
Capacitance Tolerance:	± 20%								
Dissipation Factor:	15% maximum @ 120 Hz, +20°C								
Leakage Current:	3√CV (µA) max. after 5 minutes; C = Capacitance in µF, V = WV								
Ripple Current Multipliers:	Frequency(Hz):	100~120	500	1k	10k	Temperature (°C):	105°C	85°C	≤70°C
	200WV:	1.0	1.2	1.25	1.4	Multiplier:	1.0	1.42	1.6
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 6)								

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

Part Number System



TS-EE Standard Ratings

(part numbers shown with 2 pins and 4mm length terminal)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})				Panasonic Part Number		Part Number Suffix Slewing Options		
		120Hz	10kHz~	20°C ESR (Ω, max.) 120Hz	20kHz	PVC with Top Plate	PVC without Top Plate	PET without Top Plate		
200 VDC Working, 250 VDC Surge										
300	22 x 25	1.70	2.38	0.829	0.592	EETEE2D301H_	A	(No suffix)	J	
390	22 x 30	2.17	3.04	0.637	0.455	EETEE2D391H_	A	(No suffix)	J	
590	22 x 40	2.30	3.22	0.421	0.300	EETEE2D591H_	A	(No suffix)	J	
	25 x 30	2.30	3.22	0.421	0.300	EETEE2D591J_	A	(No suffix)	J	
700	22 x 45	2.65	3.71	0.355	0.254	EETEE2D701H_	A	(No suffix)	J	
	25 x 35	2.65	3.71	0.355	0.254	EETEE2D701J_	A	(No suffix)	J	
590	30 x 25	3.08	4.31	0.421	0.300	EETEE2D591K_	A	(No suffix)	J	
	800	22 x 50	3.08	4.31	0.311	0.222	EETEE2D801H_	A	(No suffix)	J
800		25 x 40	3.08	4.31	0.311	0.222	EETEE2D801J_	A	(No suffix)	J
	1000	30 x 30	3.48	4.87	0.311	0.222	EETEE2D801K_	A	(No suffix)	J
35 x 25		3.48	4.87	0.311	0.222	EETEE2D801L_	A	(No suffix)	J	
25 x 50		3.48	4.87	0.249	0.178	EETEE2D102J_	A	(No suffix)	J	
1000	30 x 35	3.98	5.57	0.249	0.178	EETEE2D102K_	A	(No suffix)	J	
	35 x 30	4.20	5.88	0.249	0.178	EETEE2D102L_	A	(No suffix)	J	
1200	30 x 40	4.20	5.88	0.209	0.149	EETEE2D122K_	A	(No suffix)	J	
1300	30 x 45	4.62	6.47	0.191	0.136	EETEE2D132K_	A	(No suffix)	J	
1500	35 x 40	4.62	6.47	0.166	0.118	EETEE2D152L_	A	(No suffix)	J	
	30 x 50	5.22	7.31	0.166	0.118	EETEE2D152K_	A	(No suffix)	J	
1800	35 x 45	5.22	7.31	0.138	0.099	EETEE2D182L_	A	(No suffix)	J	

TS-XB Series 105°C, 7000 hours

- Designed for long life industrial applications
- Compact size
- Compact size



Rated Working Voltage:	160 ~ 250 VDC	315 ~ 450 VDC																																			
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C																																			
Nominal Capacitance:	180 ~ 2200μF	39 ~ 680μF																																			
Capacitance Tolerance:	± 20%																																				
Dissipation Factor:	15% maximum (120Hz, +20°C)																																				
Leakage Current:	3√CV (μA) max. after 5 minutes; C = Capacitance in μF, V = WV																																				
Ripple Current Multipliers:	<table border="1"> <thead> <tr> <th colspan="6">Ripple Current Frequency Factors</th> <th colspan="5">Ripple Current Ambient Temperature Factors*</th> </tr> <tr> <th>Frequency(Hz):</th> <th>50</th> <th>60</th> <th>100~120</th> <th>500</th> <th>1k</th> <th>10k~</th> <th colspan="5">Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C</th> </tr> </thead> <tbody> <tr> <td>160~450WV:</td> <td>0.75</td> <td>0.8</td> <td>1.0</td> <td>1.2</td> <td>1.25</td> <td>1.4</td> <td colspan="5">Multiplier: 1.0 1.7 2.0 2.2 2.35</td> </tr> </tbody> </table>		Ripple Current Frequency Factors						Ripple Current Ambient Temperature Factors*					Frequency(Hz):	50	60	100~120	500	1k	10k~	Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C					160~450WV:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier: 1.0 1.7 2.0 2.2 2.35				
Ripple Current Frequency Factors						Ripple Current Ambient Temperature Factors*																															
Frequency(Hz):	50	60	100~120	500	1k	10k~	Ambient Temperature: 105°C 85°C 70°C 60°C ≤45°C																														
160~450WV:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier: 1.0 1.7 2.0 2.2 2.35																														
Endurance:	7000 hours at +105°C with maximum specified ripple current (see page 6)																																				

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

Part Number System

E E T
Common Code

X B
Series Code

□ □
Voltage Code

□ □ □ □
Capacitance Code

Diameter	Diameter / Terminal Code		
	# of pins:	2	2
pin length:	6.3mm	4.0mm	4.0mm
22mm	B	H	P
25mm	C	J	Q
30mm	D	K	R
35mm	E	L	S

(Please see page 10 for details)

Insulation Options	
A	PVC with top plate
	PVC without top plate (no suffix)
J	PET sleeve without plate

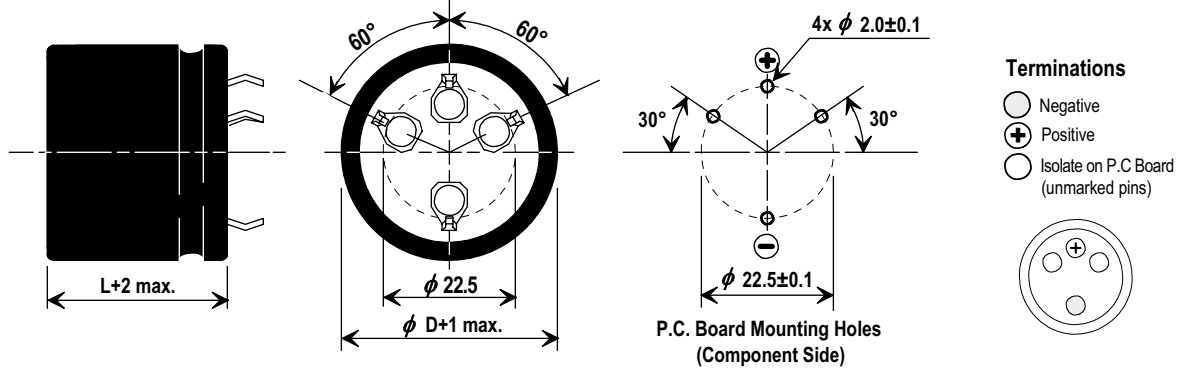
TS-XB Standard Ratings (part numbers shown with 2 pins, 6.3mm length terminal, and top vinyl plate)

Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number	Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz				120Hz	20kHz			
160 VDC Working, 200 VDC Surge							180 VDC Working, 225 VDC Surge (continued)						
270	22 x 25	1.10	1.54	0.655	0.295	EETXB2C271BA	470	22 x 35	1.40	1.96	0.376	0.17	EETXB2P471BA
330	22 x 30	1.20	1.68	0.536	0.241	EETXB2C331BA		25 x 30	1.40	1.96	0.376	0.17	EETXB2P471CA
390	22 x 30	1.30	1.82	0.453	0.204	EETXB2C391BA		30 x 25	1.40	1.96	0.376	0.17	EETXB2P471DA
	25 x 25	1.30	1.82	0.453	0.204	EETXB2C391CA	560	22 x 40	1.50	2.10	0.316	0.14	EETXB2P561BA
470	22 x 35	1.40	1.96	0.376	0.169	EETXB2C471BA		25 x 35	1.50	2.10	0.316	0.14	EETXB2P561CA
	25 x 30	1.40	1.96	0.376	0.169	EETXB2C471CA		30 x 25	1.50	2.10	0.316	0.14	EETXB2P561DA
560	22 x 40	1.50	2.10	0.316	0.142	EETXB2C561BA	680	22 x 50	1.70	2.38	0.260	0.12	EETXB2P681BA
	25 x 30	1.50	2.10	0.316	0.142	EETXB2C561CA		25 x 40	1.70	2.38	0.260	0.12	EETXB2P681CA
	30 x 25	1.50	2.10	0.316	0.142	EETXB2C561DA		30 x 30	1.70	2.38	0.260	0.12	EETXB2P681DA
680	22 x 45	1.70	2.38	0.260	0.117	EETXB2C681BA	820	25 x 45	2.00	2.80	0.216	0.10	EETXB2P821CA
	25 x 35	1.70	2.38	0.260	0.117	EETXB2C681CA		30 x 35	2.00	2.80	0.234	0.11	EETXB2P821DA
	30 x 30	1.70	2.38	0.260	0.117	EETXB2C681DA		35 x 30	2.00	2.80	0.234	0.11	EETXB2P821EA
820	25 x 40	2.00	2.80	0.216	0.097	EETXB2C821CA	1000	30 x 40	2.20	3.08	0.192	0.10	EETXB2P102DA
	30 x 30	2.00	2.80	0.216	0.097	EETXB2C821DA		35 x 30	2.20	3.08	0.192	0.10	EETXB2P102EA
	1000	25 x 45	2.20	3.08	0.177	0.080	EETXB2C102CA	1200	30 x 45	2.30	3.22	0.160	0.08
1200	30 x 35	2.20	3.08	0.177	0.080	EETXB2C102DA		35 x 35	2.30	3.22	0.172	0.09	EETXB2P122EA
	25 x 50	2.30	3.22	0.160	0.080	EETXB2C122CA	1500	30 x 50	2.50	3.50	0.138	0.07	EETXB2P152DA
	30 x 40	2.30	3.22	0.160	0.080	EETXB2C122DA		35 x 40	2.50	3.50	0.138	0.07	EETXB2P152EA
1500	35 x 35	2.30	3.22	0.160	0.080	EETXB2C122EA	1800	35 x 45	2.70	3.78	0.115	0.07	EETXB2P182EA
	30 x 45	2.50	3.50	0.128	0.064	EETXB2C152DA	2200	35 x 50	2.90	4.06	0.094	0.06	EETXB2P222EA
35 x 35	2.50	3.50	0.128	0.064	EETXB2C152EA	200 VDC Working, 250 VDC Surge							
1800	30 x 50	2.70	3.78	0.115	0.057	EETXB2C182DA	220	22 x 25	1.00	1.40	0.804	0.36	EETXB2D221BA
	35 x 40	2.70	3.78	0.115	0.057	EETXB2C182EA	270	22 x 30	1.10	1.54	0.655	0.29	EETXB2D271BA
2200	35 x 50	2.90	4.06	0.094	0.056	EETXB2C222EA		25 x 25	1.10	1.54	0.655	0.29	EETXB2D271CA
180 VDC Working, 225 VDC Surge							330	22 x 30	1.20	1.68	0.536	0.24	EETXB2D331BA
220	22 x 25	1.00	1.40	0.804	0.36	EETXB2P221BA		25 x 25	1.20	1.68	0.536	0.24	EETXB2D331CA
270	22 x 25	1.10	1.54	0.655	0.29	EETXB2P271BA	390	22 x 35	1.30	1.82	0.453	0.20	EETXB2D391BA
330	22 x 30	1.20	1.68	0.536	0.24	EETXB2P331BA		25 x 30	1.30	1.82	0.453	0.20	EETXB2D391CA
	25 x 25	1.20	1.68	0.536	0.24	EETXB2P331CA		30 x 25	1.30	1.82	0.453	0.20	EETXB2D391DA
390	22 x 30	1.30	1.82	0.453	0.20	EETXB2P391BA	470	22 x 40	1.40	1.96	0.376	0.17	EETXB2D471BA
	25 x 25	1.30	1.82	0.453	0.20	EETXB2P391CA		25 x 35	1.40	1.96	0.376	0.17	EETXB2D471CA

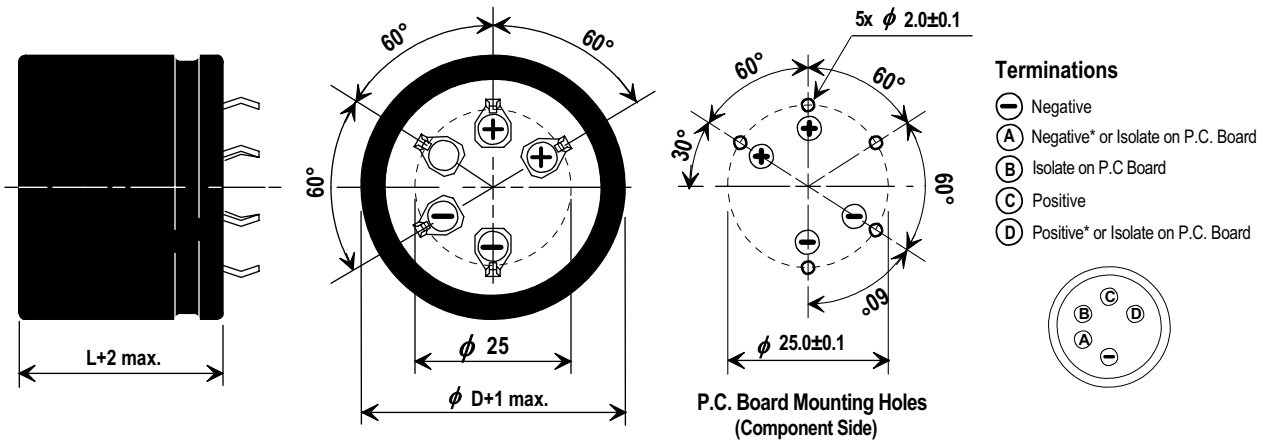
T Type General Information

Dimensions

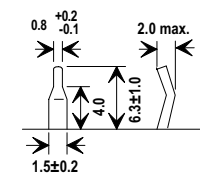
4 Pin Style (35 & 40mm Diameters)



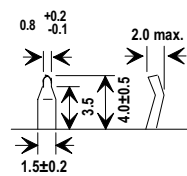
5 Pin Style (40 & 50mm Diameters)



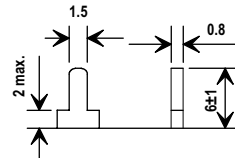
Terminal Dimensions



Snap-in Style (Standard)



4mm Length Snap-in Style
(Check Availability)



Straight Pin with Standoff

Standard Packaging Quantities

Diameter	Length	Box Quantity
35mm	≤50mm	100
35mm	>50mm	50
40mm	All	50
50mm	All	42

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

T-UP Series 85°C, 3000 hours

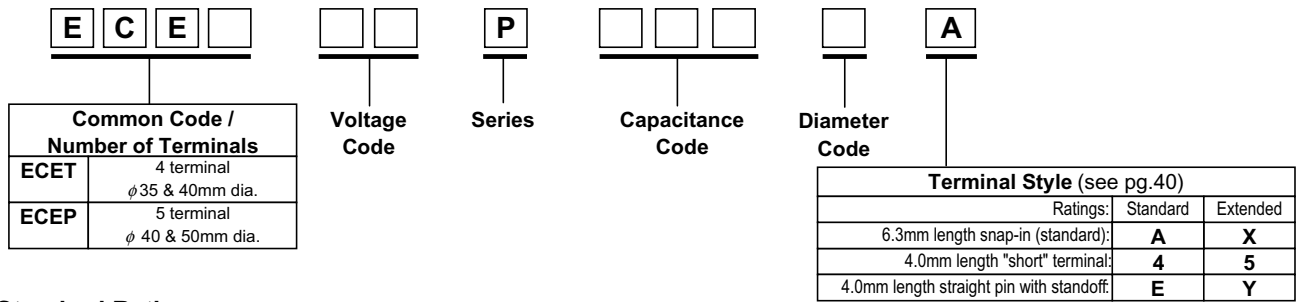
- 4 or 5 terminal mounting provides stability and keyed polarity
- Extended CV ratings
- Endurance rating of 3000 hours at 85°C
- Can vent construction



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 500 VDC
Operating Temperature:	-40 ~ +85°C	-25 ~ +85°C
Nominal Capacitance:	1200 ~ 270000µF (±20% tolerance)	220 ~ 2700µF (±20% tolerance)
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
	160-500WV:	0.75 0.8 1.0 1.2 1.25 1.4
		Ambient Temperature Factor*
		Temperature (°C):
		85°C 70°C 60°C ≤45°C
		Multiplier:
		1.0 1.3 1.4 1.5
Endurance:	3000 hours at +85°C with maximum specified ripple current (see page 6)	

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

Part Number System



T-UP Standard Ratings

Cap. (µF)	Size (mm) D x L	Max 85°C R.C. (A _{rms})		Max 20°C E.S.R. (Ω)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
16 VDC Working, 20 VDC Surge						
47000	35 x 40	7.47	8.59	0.021	0.019	ECET1CP473EA
56000	40 x 40	9.05	10.41	0.022	0.021	ECET1CP563FA
68000	35 x 50	9.05	10.41	0.018	0.017	ECET1CP683EA
82000	35 x 63	10.02	11.52	0.016	0.015	ECET1CP823EA
	40 x 50	10.29	11.83	0.016	0.015	ECET1CP823FA
100000	35 x 80	11.00	12.65	0.015	0.014	ECET1CP104EA
	40 x 63	11.36	13.06	0.018	0.017	ECET1CP104FA
120000	35 x 105	12.81	14.73	0.014	0.013	ECET1CP124EA
	40 x 80	12.42	14.28	0.017	0.016	ECET1CP124FA
	50 x 50	13.17	15.15	0.014	0.013	ECEP1CP124HA
150000	50 x 63	14.40	16.56	0.012	0.011	ECEP1CP154HA
	40 x 105	14.85	17.08	0.013	0.012	ECET1CP184FA
180000	50 x 80	15.69	18.04	0.011	0.010	ECET1CP184HA
	50 x 92	16.73	19.24	0.010	0.009	ECEP1CP224HA
270000	50 x 105	17.79	20.46	0.009	0.008	ECEP1CP274HA
25 VDC Working, 32 VDC Surge						
33000	35 x 40	6.84	7.87	0.019	0.015	ECET1EP333EA
39000	40 x 40	8.00	9.20	0.020	0.018	ECET1EP393FA
47000	35 x 50	8.00	9.20	0.014	0.012	ECET1EP473EA
56000	35 x 63	8.85	10.18	0.015	0.013	ECET1EP563EA
	40 x 50	8.96	10.30	0.016	0.015	ECET1EP563FA
68000	35 x 80	10.43	11.99	0.013	0.011	ECET1EP683EA
	40 x 63	10.25	11.79	0.017	0.015	ECET1EP683FA
82000	50 x 50	12.29	14.13	0.016	0.015	ECEP1EP823HA
100000	35 x 105	11.97	13.77	0.010	0.008	ECET1EP104EA
	40 x 80	12.08	13.89	0.012	0.011	ECET1EP104FA
	50 x 63	13.45	15.47	0.014	0.013	ECET1EP104HA
120000	50 x 80	15.29	17.58	0.012	0.011	ECEP1EP124HA
150000	40 x 105	14.07	16.18	0.011	0.010	ECET1EP154FA
	50 x 92	16.01	18.41	0.011	0.010	ECEP1EP154HA
180000	50 x 105	16.89	19.42	0.010	0.009	ECEP1EP184HA
35 VDC Working, 44 VDC Surge						
22000	35 x 40	6.10	7.02	0.026	0.020	ECET1VP223EA
27000	40 x 40	6.84	7.87	0.021	0.017	ECET1VP273FA
35 VDC Working, 44 VDC Surge (continued)						
33000	35 x 50	7.15	8.22	0.018	0.014	ECET1VP333EA
39000	35 x 63	7.94	9.13	0.015	0.012	ECET1VP393EA
	40 x 50	7.98	9.18	0.017	0.014	ECET1VP393FA
47000	35 x 80	9.53	10.96	0.014	0.011	ECET1VP473EA
	40 x 63	9.58	11.02	0.016	0.013	ECET1VP473FA
56000	40 x 80	10.30	11.85	0.015	0.012	ECET1VP563FA
	50 x 50	10.94	12.58	0.015	0.012	ECEP1VP563HA
68000	35 x 105	10.62	12.21	0.010	0.008	ECET1VP683EA
	50 x 63	11.93	13.72	0.013	0.011	ECEP1VP683HA
82000	40 x 105	12.02	13.82	0.012	0.009	ECET1VP823FA
	50 x 80	13.06	15.02	0.012	0.010	ECEP1VP823HA
100000	50 x 92	13.97	16.07	0.011	0.009	ECEP1VP104HA
	120000	50 x 105	14.86	17.09	0.010	0.008
50 VDC Working, 63 VDC Surge						
15000	35 x 40	6.44	7.41	0.028	0.021	ECET1HP153EA
18000	40 x 40	6.94	7.98	0.023	0.017	ECET1HP183FA
22000	35 x 50	7.57	8.71	0.021	0.017	ECET1HP223EA
27000	35 x 63	8.31	9.56	0.018	0.015	ECET1HP273EA
	40 x 50	8.12	9.34	0.018	0.015	ECET1HP273FA
33000	35 x 80	9.23	10.61	0.015	0.012	ECET1HP333EA
	40 x 63	9.10	10.47	0.018	0.014	ECET1HP333FA
	50 x 50	10.48	12.05	0.018	0.014	ECEP1HP333HA
39000	40 x 80	10.12	11.64	0.015	0.012	ECET1HP393FA
47000	35 x 105	10.27	11.81	0.014	0.011	ECET1HP473EA
	50 x 63	11.54	13.27	0.013	0.010	ECEP1HP473HA
56000	40 x 105	11.47	13.19	0.012	0.009	ECET1HP563FA
	50 x 80	12.46	14.33	0.012	0.009	ECET1HP563HA
68000	50 x 92	13.17	15.15	0.011	0.009	ECEP1HP683HA
82000	50 x 105	13.87	15.95	0.011	0.008	ECEP1HP823HA
63 VDC Working, 79 VDC Surge						
10000	35 x 40	6.52	7.50	0.041	0.033	ECET1JP103EA
12000	35 x 50	7.15	8.22	0.035	0.028	ECET1JP123EA
	40 x 40	7.15	8.22	0.035	0.028	ECET1JP123FA
15000	35 x 63	7.71	8.87	0.028	0.022	ECET1JP153EA

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

T-UP Standard Ratings (continued)

Cap. (μ F)	Size (mm) D x L	Max. 85°C R.C. (A_{rms})		Max. 20°C E.S.R. (Ω)		Panasonic Part Number
		120 Hz	10kHz~	120Hz	20kHz	
400 VDC Working, 450 VDC Surge (continued)						
560	35 x 63	2.90	4.06	0.355	0.195	ECET2WP561EA
680	35 x 80	3.17	4.44	0.293	0.161	ECET2WP681EA
	40 x 50	3.15	4.41	0.293	0.161	ECET2WP681FA
820	35 x 80	3.78	5.29	0.243	0.133	ECET2WP821EA
	40 x 63	3.70	5.18	0.243	0.133	ECET2WP821FA
	50 x 50	4.31	6.03	0.263	0.145	ECEP2WP821HA
1000	40 x 80	4.21	5.89	0.216	0.119	ECET2WP102FA
	50 x 63	4.96	6.94	0.216	0.119	ECEP2WP102HA
1200	35 x 105	4.80	6.72	0.166	0.091	ECET2WP122EA
	40 x 80	4.84	6.78	0.166	0.091	ECET2WP122FA
	50 x 63	5.43	7.60	0.180	0.099	ECEP2WP122HX
	50 x 80	5.71	7.99	0.180	0.099	ECEP2WP122HA
1500	40 x 105	5.81	8.13	0.133	0.073	ECET2WP152FA
	50 x 80	6.15	8.61	0.144	0.079	ECEP2WP152HX
	50 x 92	6.55	9.17	0.144	0.079	ECEP2WP152HA
1800	50 x 92	7.02	9.83	0.120	0.066	ECEP2WP182HX
	50 x 105	7.36	10.30	0.120	0.066	ECEP2WP182HA
500 VDC Working, 550 VDC Surge						
270	35 x 40	1.76	2.46	0.614	0.276	ECET2HP271EA
330	40 x 40	2.16	3.02	0.502	0.276	ECET2HP331FA
390	35 x 50	2.22	3.11	0.425	0.234	ECET2HP391EA
470	35 x 63	2.58	3.61	0.353	0.194	ECET2HP471EA
	40 x 50	2.70	3.78	0.353	0.194	ECET2HP471FA
560	40 x 63	3.11	4.35	0.326	0.179	ECET2HP561FA
	50 x 50	3.52	4.93	0.355	0.195	ECEP2HP561HA
680	35 x 80	3.21	4.49	0.244	0.134	ECET2HP681EA
	50 x 50	3.88	5.43	0.293	0.161	ECEP2HP681HX
	50 x 63	4.07	5.70	0.293	0.161	ECEP2HP681HA
820	35 x 105	3.97	5.56	0.202	0.111	ECET2HP821EA
	40 x 80	3.88	5.43	0.222	0.122	ECET2HP821FA
	50 x 63	4.47	6.26	0.222	0.122	ECEP2HP821HA
1000	50 x 80	5.05	7.07	0.199	0.109	ECEP2HP102HA
1200	40 x 105	5.90	8.26	0.152	0.084	ECET2HP122FA
	50 x 80	5.35	7.49	0.166	0.091	ECEP2HP122HX
	50 x 92	5.74	8.04	0.166	0.091	ECEP2HP122HA
1500	50 x 105	6.65	9.31	0.144	0.079	ECEP2HP152HA

T-HA Series 105°C, 3000 hours

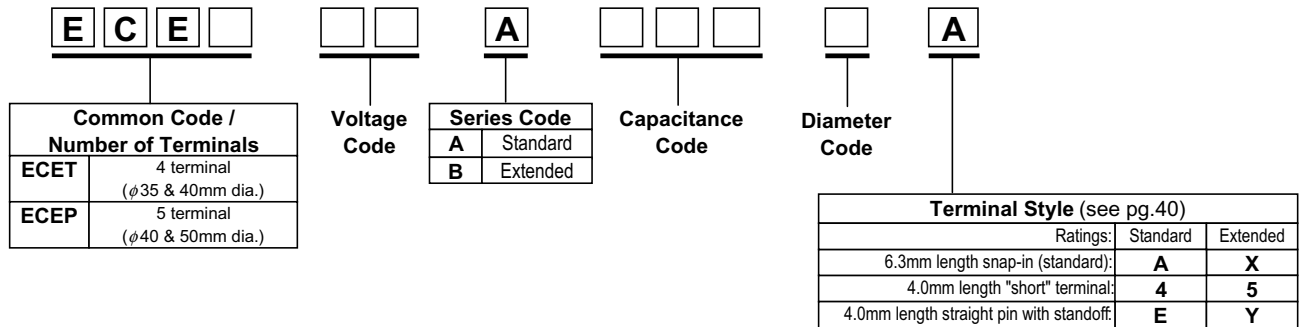
- Long Life - endurance rating of 3000 hours at 105°C
- 4 or 5 terminal mounting provides stability and keyed polarity
- Extended higher CV ratings
- Can vent construction



Rated Working Voltage:	16 ~ 250 VDC	350 ~ 450 VDC
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C
Nominal Capacitance:	1000~ 250000μF (±20% tolerance)	330 ~ 2700μF (±20% tolerance)
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
Endurance:	3000 hours at +105°C with maximum specified ripple current (see page 6)	

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

Part Number System

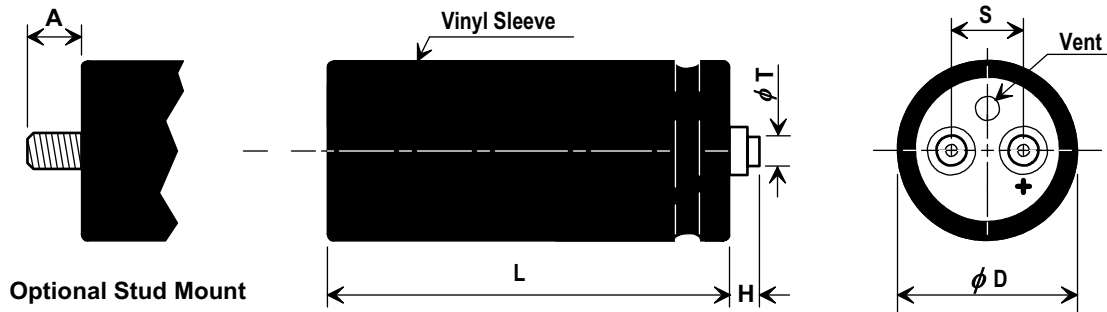


T-HA Standard Ratings

Cap. (μF)	Size (mm) D x L	Max 105°C R.C. (A _{rms})		Max 20°C ESR (Ω)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
16 VDC Working, 20 VDC Surge						
39000	35 x 40	5.10	5.87	0.022	0.020	ECET1CA393EA
47000	40 x 40	5.50	6.33	0.020	0.018	ECET1CA473FA
56000	35 x 50	6.00	6.90	0.019	0.017	ECET1CA563EA
68000	35 x 63	6.62	7.61	0.017	0.015	ECET1CA683EA
	40 x 50	7.29	8.38	0.015	0.014	ECET1CA683FA
82000	40 x 63	7.66	8.81	0.017	0.015	ECET1CA823FA
100000	35 x 80	8.03	9.23	0.015	0.013	ECET1CA104EA
120000	35 x 105	8.71	10.02	0.014	0.012	ECET1CA124EA
	40 x 80	8.79	10.11	0.014	0.012	ECET1CA124FA
	50 x 50	9.02	10.37	0.015	0.014	ECEP1CA124HA
150000	40 x 105	9.88	11.36	0.013	0.012	ECET1CA154FA
	50 x 63	10.15	11.67	0.014	0.013	ECEP1CA154HA
180000	50 x 80	11.02	12.67	0.013	0.012	ECEP1CA184HA
220000	50 x 92	11.71	13.47	0.012	0.011	ECEP1CA224HA
250000	50 x 105	12.31	14.16	0.011	0.010	ECEP1CA254HA
35 VDC Working, 44 VDC Surge						
18000	35 x 40	4.30	4.95	0.028	0.021	ECET1VA183EA
22000	35 x 50	5.00	5.75	0.023	0.017	ECET1VA223EA
	40 x 40	5.00	5.75	0.023	0.017	ECET1VA223FA
27000	35 x 63	5.53	6.36	0.025	0.018	ECET1VA273EA
	40 x 50	5.44	6.26	0.020	0.015	ECET1VA273FA
33000	40 x 63	6.61	7.60	0.019	0.014	ECET1VA333FA
39000	35 x 80	6.52	7.50	0.019	0.014	ECET1VA393EA
47000	35 x 105	8.07	9.28	0.017	0.013	ECET1VA473EA
	40 x 80	7.79	8.96	0.018	0.013	ECET1VA473FA
	50 x 50	8.25	9.49	0.021	0.016	ECEP1VA473HA
56000	50 x 63	9.07	10.43	0.019	0.014	ECEP1VA563HA
68000	40 x 105	9.27	10.66	0.016	0.012	ECET1VA683FA
	50 x 80	10.07	11.58	0.017	0.013	ECEP1VA683HA
82000	50 x 92	10.89	12.52	0.015	0.011	ECEP1VA823HA
100000	50 x 105	11.75	13.51	0.013	0.010	ECEP1VA104HA
25 VDC Working, 32 VDC Surge						
27000	35 x 40	4.80	5.52	0.018	0.017	ECET1EA273EA
33000	35 x 50	5.50	6.33	0.018	0.016	ECET1EA333EA
	40 x 40	5.50	6.33	0.018	0.016	ECET1EA333FA
47000	35 x 63	6.56	7.54	0.017	0.015	ECET1EA473EA
	40 x 50	6.47	7.44	0.015	0.014	ECET1EA473FA
56000	35 x 80	7.25	8.34	0.015	0.013	ECET1EA563EA
	40 x 63	7.17	8.25	0.014	0.013	ECET1EA563FA
82000	35 x 105	8.58	9.87	0.013	0.012	ECET1EA823EA
	40 x 80	8.68	9.98	0.013	0.012	ECET1EA823FA
	50 x 50	9.20	10.58	0.016	0.015	ECEP1EA823HA
100000	40 x 105	9.76	11.22	0.012	0.010	ECET1EA104FA
	50 x 63	10.02	11.52	0.015	0.013	ECEP1EA104HA
120000	50 x 80	10.93	12.57	0.013	0.012	ECEP1EA124HA
150000	50 x 92	11.70	13.46	0.012	0.011	ECEP1EA154HA
180000	50 x 105	12.42	14.28	0.010	0.009	ECEP1EA184HA
50 VDC Working, 63 VDC Surge						
10000	35 x 40	4.00	4.60	0.033	0.025	ECET1HA103EA
15000	35 x 50	4.80	5.52	0.022	0.018	ECET1HA153EA
	40 x 40	4.80	5.52	0.022	0.018	ECET1HA153FA
18000	35 x 63	5.27	6.06	0.020	0.016	ECET1HA183EA
22000	40 x 50	5.15	5.92	0.016	0.013	ECET1HA223FA
27000	35 x 80	6.16	7.08	0.015	0.012	ECET1HA273EA
	40 x 63	6.05	6.96	0.015	0.012	ECET1HA273FA
33000	35 x 105	7.23	8.31	0.013	0.010	ECET1HA333EA
	50 x 50	7.75	8.91	0.018	0.014	ECEP1HA333FA
	39000	40 x 80	7.55	8.68	0.014	0.011
47000	50 x 63	8.40	9.66	0.016	0.013	ECEP1HA393HA
	40 x 105	8.18	9.41	0.012	0.010	ECET1HA473FA
56000	50 x 80	9.19	10.57	0.014	0.011	ECEP1HA473HA
	50 x 92	9.79	11.26	0.012	0.009	ECEP1HA563HA
68000	50 x 105	10.42	11.98	0.011	0.009	ECEP1HA683HA

G Type General Information

Dimensions



Case Code	Nominal Size DxL (inches)	Sleeved Case Dimensions							Terminal Specifications (inches)								
		Inches			Millimeters			Stud Option	Terminal / Mtg. Code		Thread	Min. thread depth	H±0.031	φT ±0.010			
		φD ±0.031	L ±0.062	S ±0.016	φD ±0.79	L ±1.58	S ±0.41	Thread	A±1mm	No Stud	With Stud						
CA	1.375 x 1.625	1.395	1.656	0.500	35.4	42.1	12.7	M8	12	E	N	10-32 NF-2B	0.375	0.250	0.314		
CC	1.375 x 2.125		2.156							54.8	L	Q	10-32 NF-2B	0.218	0.062	0.314	
CE	1.375 x 2.625		2.656							67.5	M	R	M5	0.375	0.250	0.314	
CG	1.375 x 3.125		3.156							80.2	P	U	M5	0.335	0.207	0.508	
CH	1.375 x 3.625		3.656							92.9	H	T	1/4-28 NF-2B	0.469	0.250	0.684	
CK	1.375 x 4.125		4.156							105.6	J	S	1/4-28 NF-2B	0.354	0.110	0.684	
CL	1.375 x 4.625		4.656							118.3	X	W	M6	0.469	0.250	0.684	
CN	1.375 x 5.125		5.156							131.0	Y	V	M6	0.354	0.110	0.684	
CP	1.375 x 5.625		5.656							143.7							
FB	2.000 x 1.875		2.020							1.906	0.863	51.3	48.4	21.9	M12	16	E
FC	2.000 x 2.125	2.156		54.8	L	Q	10-32 NF-2B	5.5	1.6	8.0							
FE	2.000 x 2.625	2.656		67.5	M	R	M5	9.5	6.4	8.0							
FG	2.000 x 3.125	3.156		80.2	P	U	M5	8.5	5.3	12.9							
FH	2.000 x 3.625	3.656		92.9	H	T	1/4-28 NF-2B	11.9	6.4	17.4							
FK	2.000 x 4.125	4.156		105.6	J	S	1/4-28 NF-2B	9.0	2.8	17.4							
FL	2.000 x 4.625	4.656		118.3	X	W	M6	11.9	6.4	17.4							
FN	2.000 x 5.125	5.156		131.0	Y	V	M6	9.0	2.8	17.4							
FP	2.000 x 5.625	5.656		143.7													
GG	2.500 x 3.125	2.520		3.156	1.125	64.0	80.2	28.6	M12	16							L
GH	2.500 x 3.625		3.656	92.9							M	R	O	O	O	O	
GK	2.500 x 4.125		4.156	105.6							P	U	N.A.	N.A.	O	O	40
GL	2.500 x 4.625		4.656	118.3							H	T	N.A.	N.A.	O	O	
GN	2.500 x 5.125		5.156	131.0							J	S	N.A.	N.A.	O	O	
GP	2.500 x 5.625		5.656	143.7							X	W	N.A.	N.A.	O	O	
HP	3.000 x 5.125	5.156	143.7	Y	V	N.A.	N.A.	O	O								
HW	3.000 x 8.625	8.656	219.9														

Terminal Availability by Diameter						
Terminal / Mtg. Code		Nominal Diameter				Max. ripple current (A)
No Stud	With Stud	1.375"	2.000"	2.500"	3.000"	
E	N	S	S	S	S	30
L	Q	O	O	O	O	
M	R	O	O	O	O	
P	U	N.A.	N.A.	O	O	40
H	T	N.A.	N.A.	O	O	
J	S	N.A.	N.A.	O	O	
X	W	N.A.	N.A.	O	O	50
Y	V	N.A.	N.A.	O	O	

S: standard O: optional N.A.: not available

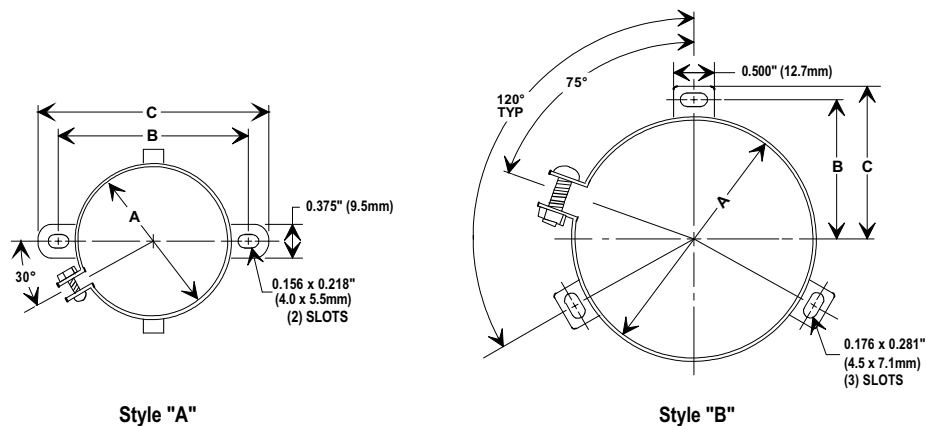
Standard Packaging Quantities

Diameter	Length	Box Quantity
1.375" (35mm)	1.625" (41mm)	100
1.375" (35mm)	>1.625" (41mm)	50
2.000" (51mm)	All	42
2.500" (64mm)	All	30
3.000" (76mm)	All	20

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

G Type Mounting Hardware

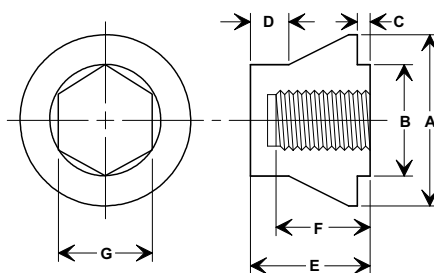
Mounting Clamp



Material: 20GA. (0.95mm) Zinc Plated Steel

Style	Dia. (A)	B	C	P/N
A	1.375" (35mm)	1.781" (45.2mm)	2.129" (54.1mm)	EJGHMC36B2
B	2.000" (51mm)	1.250" (31.8mm)	1.437" (36.5mm)	EJGHMC51B3
	2.500" (64mm)	1.500" (38.1mm)	1.690" (42.9mm)	EJGHMC64B3
	3.000" (76mm)	1.750" (44.5mm)	1.937" (49.2mm)	EJGHMC77B3

Stud Mount Hardware Insulating Nut



Material: ABS

Dimensions (mm)

Thread	A	B	C	D	E	F (min.)	G	P/N
M8	25	17	1	4	15	11	17	EJGHSN8X17
M12	30	22	1.4	6	17.5	15	19	EJGHSN12X22
M12	38	30	1.4	6	18	15	19	EJGHSN12X30

G-AA Series 85°C, 3000 hours

- General purpose for industrial applications
- High ripple current with 3000 hour life
- Stud mount available



Rated Working Voltage:	16 ~ 500 VDC	Ripple Current Multipliers:	Frequency (Hz):	50	60	100-120	300-360	1k	10k~
Operating Temperature:	-40 ~ +85°C		16-100WV:	0.9	0.95	1.0	1.05	1.08	1.15
Nominal Capacitance:	150 ~ 1200000μF		160-500WV:	0.75	0.8	1.0	1.2	1.25	1.4
Capacitance Tolerance:	± 20%		Ambient Temperature Factor**						
Max. Leakage Current:	3√CV (μA) after 5 minutes; C = Cap. in μF, V = WV		Ambient Temperature:	85°C	70°C	60°C	≤45°C		
Endurance:	3000 hours at +85°C*	Ripple Current Factor:	1.0	1.6	2.0	2.2			

*with maximum rated ripple current applied. See page 6 for additional details. **Use of temperature ripple current multipliers may limit life to the hours specified for the maximum operating temperature.

Part Number System



Common Code



Series Code



Voltage Code



Capacitance Code



Case Size Code



Terminal / Mounting Code

"E" code (high post, 10-32 NF-2B thread, no stud) is shown. Please see page 46 for other terminal and mounting options

NOTE: Series code in part number formerly "AA", shortened to "A"

G-AA Typical Ratings

Cap. (μF)	Nominal Size D x L (inches)	Max 85°C R.C. (A _{rms})		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
16 VDC Working, 20 VDC Surge						
33000	1.375 x 1.625	5.16	5.93	0.0313	0.0281	EEGA1C333CAE
39000	1.375 x 2.125	5.86	6.74	0.0269	0.0242	EEGA1C393CCE
56000	1.375 x 2.625	7.30	8.40	0.0196	0.0177	EEGA1C563CCE
68000	1.375 x 3.125	8.31	9.56	0.0167	0.0150	EEGA1C683CGE
82000	1.375 x 3.625	9.37	10.78	0.0143	0.0129	EEGA1C823CHE
100000	2.000 x 1.875	10.01	11.51	0.0143	0.0129	EEGA1C823FBE
	1.375 x 4.125	10.51	12.09	0.0123	0.0110	EEGA1C104CKE
120000	2.000 x 2.125	11.01	12.66	0.0123	0.0110	EEGA1C104FCE
	1.375 x 4.625	11.67	13.42	0.0107	0.0096	EEGA1C124CLE
130000	2.000 x 2.625	12.41	14.27	0.0107	0.0096	EEGA1C124FEE
	1.375 x 5.125	12.41	14.27	0.0101	0.0091	EEGA1C134CNE
150000	1.375 x 5.625	13.44	15.46	0.0091	0.0082	EEGA1C154CPE
	2.000 x 3.125	13.98	16.08	0.0091	0.0082	EEGA1C154FGE
180000	2.000 x 3.625	15.42	17.73	0.0081	0.0073	EEGA1C184FHE
220000	2.000 x 4.125	16.93	19.47	0.0072	0.0064	EEGA1C224FKE
270000	2.000 x 5.125	19.08	21.94	0.0052	0.0047	EEGA1C274FNE
	2.500 x 3.125	19.31	22.21	0.0064	0.0057	EEGA1C274GGE
330000	2.000 x 5.625	20.63	23.72	0.0070	0.0063	EEGA1C334FPE
	2.500 x 3.625	21.02	24.17	0.0057	0.0052	EEGA1C334GGE
390000	2.500 x 4.125	22.50	25.88	0.0053	0.0048	EEGA1C394GKE
	3.000 x 3.125	23.79	27.36	0.0053	0.0048	EEGA1C394HGE
470000	2.500 x 4.625	24.11	27.73	0.0049	0.0044	EEGA1C474GLE
	3.000 x 3.625	25.51	29.34	0.0049	0.0044	EEGA1C474HGE
500000	2.500 x 5.125	25.05	28.81	0.0048	0.0043	EEGA1C504GNE
560000	2.500 x 5.625	26.23	30.16	0.0046	0.0041	EEGA1C564GPE
	3.000 x 4.125	27.08	31.14	0.0046	0.0041	EEGA1C564HKE
680000	3.000 x 4.625	28.74	33.05	0.0043	0.0039	EEGA1C684HLE
750000	3.000 x 5.125	29.88	34.36	0.0042	0.0037	EEGA1C754HNE
820000	3.000 x 5.625	30.97	35.62	0.0040	0.0036	EEGA1C824HPE
1200000	3.000 x 8.625	36.78	42.30	0.0037	0.0033	EEGA1C125HWE
20 VDC Working, 24 VDC Surge						
27000	1.375 x 1.625	4.95	5.69	0.0327	0.0295	EEGA1D273CAE
33000	1.375 x 2.125	5.72	6.58	0.0274	0.0246	EEGA1D333CCE
47000	1.375 x 2.625	7.12	8.19	0.0202	0.0181	EEGA1D473CCE
56000	1.375 x 3.125	8.05	9.26	0.0174	0.0157	EEGA1D563CCE
68000	1.375 x 3.625	9.12	10.49	0.0149	0.0134	EEGA1D683CHE
	2.000 x 1.875	9.75	11.21	0.0149	0.0134	EEGA1D683FBE
25 VDC Working, 32 VDC Surge						
22000	1.375 x 1.625	4.93	5.67	0.0234	0.0199	EEGA1E223CAE
27000	1.375 x 2.125	5.70	6.56	0.0196	0.0167	EEGA1E273CCE
39000	1.375 x 2.625	7.16	8.23	0.0144	0.0123	EEGA1E393CCE
47000	1.375 x 3.125	8.15	9.37	0.0124	0.0106	EEGA1E473CCE
	1.375 x 3.625	9.17	10.55	0.0109	0.0092	EEGA1E563CHE
56000	2.000 x 1.875	9.78	11.25	0.0109	0.0092	EEGA1E563FBE
	1.375 x 4.125	10.31	11.86	0.0094	0.0080	EEGA1E683CCE
68000	2.000 x 2.125	10.79	12.41	0.0094	0.0080	EEGA1E683FCE
	1.375 x 4.625	11.53	13.26	0.0083	0.0070	EEGA1E823CLE
82000	2.000 x 2.625	12.24	14.08	0.0083	0.0070	EEGA1E823FCE
	1.375 x 5.125	12.39	14.25	0.0077	0.0066	EEGA1E913CNE
100000	1.375 x 5.625	13.23	15.21	0.0073	0.0062	EEGA1E104CPE

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

G-AA Typical Ratings (continued)

Cap. (μ F)	Nominal Size D x L (inches)	Max 85°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
400 VDC Working, 450 VDC Surge (continued)						
5100	2.500 x 5.625	14.51	20.31	0.035	0.024	EEGA2G512GPE
5600	3.000 x 4.625	15.95	22.33	0.032	0.022	EEGA2G562HLE
6800	3.000 x 5.125	18.01	25.21	0.026	0.018	EEGA2G682HNE
7500	3.000 x 5.625	19.36	27.10	0.024	0.017	EEGA2G752HPE
12000	3.000 x 8.625	27.80	38.92	0.015	0.010	EEGA2G123HWE
450 VDC Working, 500 VDC Surge						
220	1.375 x 1.625	1.57	2.20	0.804	0.522	EEGA2W221CAE
270	1.375 x 2.125	1.83	2.56	0.655	0.426	EEGA2W271CCE
390	1.375 x 2.625	2.35	3.29	0.453	0.295	EEGA2W391CEE
470	1.375 x 3.125	2.71	3.79	0.376	0.245	EEGA2W471CGE
560	1.375 x 3.625	3.09	4.33	0.316	0.205	EEGA2W561CHE
	2.000 x 1.875	3.25	4.55	0.316	0.205	EEGA2W561FBE
680	1.375 x 4.125	3.54	4.96	0.260	0.169	EEGA2W681CKE
	2.000 x 2.125	3.65	5.11	0.260	0.169	EEGA2W681FCE
820	1.375 x 4.625	4.03	5.64	0.216	0.140	EEGA2W821CLE
	2.000 x 2.625	4.23	5.92	0.216	0.140	EEGA2W821FEE
1000	1.375 x 5.125	4.60	6.44	0.177	0.115	EEGA2W102CNE
	2.000 x 3.125	4.87	6.82	0.177	0.115	EEGA2W102FGE
1100	1.375 x 5.625	4.98	6.97	0.161	0.104	EEGA2W112CPE
1200	2.000 x 3.625	5.54	7.76	0.147	0.096	EEGA2W122FHE
1500	2.000 x 4.125	6.40	8.96	0.118	0.077	EEGA2W152FKE
1800	2.500 x 3.125	7.45	10.43	0.098	0.064	EEGA2W182GGE
2200	2.000 x 5.125	8.25	11.55	0.080	0.052	EEGA2W222FNE
	2.500 x 3.625	8.53	11.94	0.080	0.052	EEGA2W222GHE
2700	2.000 x 5.625	9.39	13.15	0.065	0.043	EEGA2W272FPE
	2.500 x 4.125	9.73	13.62	0.065	0.043	EEGA2W272GKE
	3.000 x 3.125	10.17	14.24	0.065	0.043	EEGA2W272HGE
3300	2.500 x 4.625	11.09	15.53	0.054	0.035	EEGA2W332GLE
	3.000 x 3.625	11.60	16.24	0.054	0.035	EEGA2W332HHE
3600	2.500 x 5.125	11.89	16.65	0.049	0.032	EEGA2W362GNE
3900	2.500 x 5.625	12.69	17.77	0.045	0.029	EEGA2W392GPE
	3.000 x 4.125	12.95	18.13	0.045	0.029	EEGA2W392HKE
4700	3.000 x 4.625	14.62	20.47	0.038	0.024	EEGA2W472HLE
5600	3.000 x 5.125	16.34	22.88	0.032	0.021	EEGA2W562HNE
6200	3.000 x 5.625	17.60	24.64	0.029	0.019	EEGA2W622HPE
10000	3.000 x 8.625	25.38	35.53	0.018	0.011	EEGA2W103HWE
500 VDC Working, 550 VDC Surge						
150	1.375 x 1.625	1.24	1.74	1.375	0.963	EEGA2H151CAE
180	1.375 x 2.125	1.43	2.00	1.146	0.802	EEGA2H181CCE
220	1.375 x 2.625	1.69	2.37	0.938	0.656	EEGA2H221CEE
330	1.375 x 3.125	2.17	3.04	0.625	0.438	EEGA2H331CGE
390	1.375 x 3.625	2.47	3.46	0.529	0.370	EEGA2H391CHE
	2.000 x 1.875	2.71	3.79	0.529	0.370	EEGA2H391FBE
470	1.375 x 4.125	2.81	3.93	0.439	0.307	EEGA2H471CKE
	2.000 x 2.125	3.03	4.24	0.439	0.307	EEGA2H471FCE
560	1.375 x 4.625	3.18	4.45	0.368	0.258	EEGA2H561CLE
	2.000 x 2.625	3.48	4.87	0.368	0.258	EEGA2H561FEE
680	1.375 x 5.125	3.62	5.07	0.303	0.212	EEGA2H681CNE
750	1.375 x 5.625	3.92	5.49	0.275	0.193	EEGA2H751CPE
820	2.000 x 3.125	4.39	6.15	0.252	0.176	EEGA2H821FGE
1000	2.000 x 3.625	5.03	7.04	0.206	0.144	EEGA2H102FHE
1200	2.000 x 4.125	6.35	8.89	0.172	0.120	EEGA2H122FKE
	2.500 x 3.125	6.29	8.81	0.172	0.120	EEGA2H122GGE
1500	2.000 x 5.125	6.76	9.46	0.138	0.096	EEGA2H152FNE
	2.500 x 3.625	7.27	10.18	0.138	0.096	EEGA2H152GHE
1800	2.000 x 5.625	7.59	10.63	0.115	0.080	EEGA2H182FPE
	2.500 x 4.125	8.18	11.45	0.115	0.080	EEGA2H182GKE
2000	3.000 x 3.125	8.91	12.47	0.103	0.072	EEGA2H202HGE
2200	2.500 x 4.625	9.30	13.02	0.094	0.066	EEGA2H222GLE
2400	2.500 x 5.125	9.96	13.94	0.086	0.060	EEGA2H242GNE
	3.000 x 3.625	10.04	14.06	0.086	0.060	EEGA2H242HHE
2700	2.500 x 5.625	10.82	15.15	0.076	0.053	EEGA2H272GPE
	3.000 x 4.125	10.92	15.29	0.076	0.053	EEGA2H272HKE
3300	3.000 x 4.625	12.37	17.32	0.063	0.044	EEGA2H332HLE
3600	3.000 x 5.125	13.21	18.49	0.057	0.040	EEGA2H362HNE
3900	3.000 x 5.625	14.05	19.67	0.053	0.037	EEGA2H392HPE
6800	3.000 x 8.625	20.71	28.99	0.030	0.021	EEGA2H682HWE

LARGE CAN ALUMINUM ELECTROLYTIC CAPACITORS

G-BA Typical Ratings (continued)

Cap. (μ F)	Nominal Size D x L (inches)	Max 105°C R.C. (A_{rms})		20°C ESR (Ω , max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz	
400 VDC Working, 450 VDC Surge						
270	1.375 x 1.625	0.97	1.36	0.546	0.355	EEGB2G271CAE
330	1.375 x 2.125	1.13	1.58	0.447	0.290	EEGB2G331CCE
390	1.375 x 2.625	1.31	1.83	0.378	0.246	EEGB2G391CEE
560	1.375 x 3.125	1.65	2.31	0.263	0.171	EEGB2G561CGE
	2.000 x 1.875	1.82	2.55	0.263	0.171	EEGB2G561FBE
680	1.375 x 3.625	1.90	2.66	0.217	0.141	EEGB2G681CHE
	2.000 x 2.125	2.04	2.86	0.217	0.141	EEGB2G681FCE
820	1.375 x 4.125	2.17	3.04	0.180	0.117	EEGB2G821CKE
910	1.375 x 4.625	2.38	3.33	0.162	0.105	EEGB2G911CLE
1000	1.375 x 5.125	2.57	3.60	0.147	0.096	EEGB2G102CNE
	2.000 x 2.625	2.61	3.65	0.147	0.096	EEGB2G102FEE
1200	1.375 x 5.625	2.91	4.07	0.123	0.080	EEGB2G122CPE
	2.000 x 3.125	2.98	4.17	0.123	0.080	EEGB2G122FGE
1500	2.000 x 3.625	3.46	4.84	0.098	0.064	EEGB2G152FHE
1800	2.000 x 4.125	3.92	5.49	0.082	0.053	EEGB2G182FKE
2200	2.000 x 5.125	4.61	6.45	0.067	0.044	EEGB2G222FNE
	2.500 x 3.125	4.61	6.45	0.067	0.044	EEGB2G222GGE
2700	2.000 x 5.625	5.25	7.35	0.055	0.035	EEGB2G272FPE
	2.500 x 3.625	5.28	7.39	0.055	0.035	EEGB2G272GHE
3300	2.500 x 4.125	6.01	8.41	0.045	0.029	EEGB2G332GKE
	3.000 x 3.125	6.29	8.81	0.049	0.032	EEGB2G332HGE
3600	2.500 x 4.625	6.47	9.06	0.041	0.027	EEGB2G362GLE
3900	2.500 x 5.125	6.92	9.69	0.038	0.025	EEGB2G392GNE
	3.000 x 3.625	7.05	9.87	0.042	0.027	EEGB2G392HHE
4700	2.500 x 5.625	7.79	10.91	0.031	0.020	EEGB2G472GPE
	3.000 x 4.125	7.95	11.13	0.034	0.022	EEGB2G472HKE
5200	3.000 x 4.625	8.59	12.03	0.031	0.020	EEGB2G522HLE
5600	3.000 x 5.125	9.14	12.80	0.029	0.019	EEGB2G562HNE
6800	3.000 x 5.625	10.30	14.42	0.024	0.015	EEGB2G682HPE
10000	3.000 x 8.625	14.19	19.87	0.018	0.011	EEGB2G103HWE
450 VDC Working, 500 VDC Surge						
220	1.375 x 1.625	0.88	1.23	0.670	0.435	EEGB2W221CAE
270	1.375 x 2.125	1.03	1.44	0.546	0.355	EEGB2W271CCE
330	1.375 x 2.625	1.21	1.69	0.447	0.290	EEGB2W331CEE
470	1.375 x 3.125	1.51	2.11	0.314	0.204	EEGB2W471CGE
	2.000 x 1.875	1.67	2.34	0.314	0.204	EEGB2W471FBE
560	1.375 x 3.625	1.73	2.42	0.263	0.171	EEGB2W561CHE
	2.000 x 2.125	1.85	2.59	0.263	0.171	EEGB2W561FCE
680	1.375 x 4.125	1.98	2.77	0.217	0.141	EEGB2W681CKE
750	1.375 x 4.625	2.16	3.02	0.196	0.128	EEGB2W751CLE
820	1.375 x 5.125	2.33	3.26	0.180	0.117	EEGB2W821CNE
	2.000 x 2.625	2.36	3.30	0.180	0.117	EEGB2W821FEE
1000	1.375 x 5.625	2.65	3.71	0.147	0.096	EEGB2W102CPE
	2.000 x 3.125	2.72	3.81	0.147	0.096	EEGB2W102FGE
1200	2.000 x 3.625	3.10	4.34	0.123	0.080	EEGB2W122FHE
1500	2.000 x 4.125	3.58	5.01	0.098	0.064	EEGB2W152FKE
	2.500 x 3.125	3.80	5.32	0.098	0.064	EEGB2W152GGE
1800	2.000 x 5.125	4.17	5.84	0.082	0.053	EEGB2W182FNE
	2.500 x 3.625	4.31	6.03	0.082	0.053	EEGB2W182GHE
2200	2.000 x 5.625	4.74	6.64	0.067	0.044	EEGB2W222FPE
	2.500 x 4.125	4.91	6.87	0.067	0.044	EEGB2W222GKE
2700	2.500 x 4.625	5.61	7.85	0.055	0.035	EEGB2W272GLE
	3.000 x 3.125	5.69	7.97	0.060	0.039	EEGB2W272HGE
3300	2.500 x 5.125	6.36	8.90	0.045	0.029	EEGB2W332GNE
	3.000 x 3.625	6.48	9.07	0.049	0.032	EEGB2W332HHE
3900	2.500 x 5.625	7.09	9.93	0.038	0.025	EEGB2W392GPE
	3.000 x 4.125	7.24	10.14	0.042	0.027	EEGB2W392HKE
4300	3.000 x 4.625	7.82	10.95	0.038	0.025	EEGB2W432HLE
4700	3.000 x 5.125	8.37	11.72	0.034	0.022	EEGB2W472HNE
5600	3.000 x 5.625	9.35	13.09	0.029	0.019	EEGB2W562HPE
9100	3.000 x 8.625	13.54	18.96	0.019	0.013	EEGB2W912HWE

Panasonic

Electronic Components

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