

## 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:       | 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 / Terminal Code |       |       |       |
|--------------------------|-------|-------|-------|
| # of pins:               | 2     | 2     | 3     |
| 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-ED Standard Ratings (part numbers shown with 6.3mm length terminal and top vinyl plate)

| Cap.<br>(μF)                   | Size (mm)<br>D x L | Max 105°C R.C. (A <sub>rms</sub> ) |        | 20°C ESR (Ω, max.) |       | Panasonic<br>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             |

| Cap.<br>(μF)                               | Size (mm)<br>D x L | Max 105°C R.C. (A <sub>rms</sub> ) |        | 20°C ESR (Ω, max.) |       | Panasonic<br>Part Number |
|--------------------------------------------|--------------------|------------------------------------|--------|--------------------|-------|--------------------------|
|                                            |                    | 120Hz                              | 10kHz~ | 120Hz              | 20kHz |                          |
| 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 | EETED2E102DA             |
|                                            | 35 x 40            | 2.84                               | 4.06   | 0.149              | 0.067 | EETED2E102EA             |
| 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 | EETED2E152EA             |
| 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.<br>( $\mu$ F)                         | Size (mm)<br>D x L | Max 105°C R.C. (A <sub>rms</sub> ) |        | 20°C ESR ( $\Omega$ , max.) |       | Panasonic<br>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             |