

## TS-HB Series two terminal snap-in

- Very compact size (20 ~ 25% smaller than TS-HA series)
- Long 3000 hour life at 105°C with high ripple current capability
- **NEW:** 40mm diameter case sizes
- 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:<br>(120 Hz, +20°C) | Working Voltage [V]:                                                    | 160 ~ 450         |
|                                        | Max. D.F. (%):                                                          | 15                |
| Endurance:                             | 3000 hours at +105°C with maximum specified ripple current (see page 4) |                   |

### Part Number System

|                               |          |                                  |        |                     |                  |                                          |               |  |
|-------------------------------|----------|----------------------------------|--------|---------------------|------------------|------------------------------------------|---------------|--|
| <b>E</b>                      | <b>C</b> | <b>B</b>                         |        |                     |                  |                                          |               |  |
| Common Code/<br>Terminal Type |          | Voltage<br>Code                  | Series | Capacitance<br>Code | Case<br>Diameter | Top Vinyl Plate                          |               |  |
| <b>ECOS</b>                   |          | 6.3mm Length Terminal (Standard) |        |                     |                  | <b>A</b>                                 | With Plate    |  |
| <b>ECEC</b>                   |          | 4.0mm Length "Short" Terminal    |        |                     |                  | <b>B</b>                                 | Without plate |  |
| (See page 7)                  |          |                                  |        |                     |                  |                                          |               |  |
|                               |          |                                  |        | <b>A</b>            | 20mm             | Ripple Current<br>Multipliers:<br>Page 7 |               |  |
|                               |          |                                  |        | <b>B</b>            | 22mm             |                                          |               |  |
|                               |          |                                  |        | <b>C</b>            | 25mm             |                                          |               |  |
|                               |          |                                  |        | <b>D</b>            | 30mm             |                                          |               |  |
|                               |          |                                  |        | <b>E</b>            | 35mm             |                                          |               |  |
|                               |          |                                  |        | <b>F</b>            | 40mm             |                                          |               |  |

### TS-HB Standard Ratings

| 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 | 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                              | 10k~100kHz | 120Hz              | 20kHz |                          |                                |                    | 120Hz                              | 10k~100kHz | 120Hz              | 20kHz |                          |
| 160 VDC Working, 200 VDC Surge |                    |                                    |            |                    |       |                          | 200 VDC Working, 250 VDC Surge |                    |                                    |            |                    |       |                          |
| 470                            | 22 x 30            | 1.40                               | 1.96       | 0.423              | 0.190 | ECOS2CB471BA             | 390                            | 22 x 30            | 1.30                               | 1.82       | 0.510              | 0.230 | ECOS2DB391BA             |
| 560                            | 22 x 35            | 1.50                               | 2.10       | 0.355              | 0.160 | ECOS2CB561BA             | 470                            | 22 x 35            | 1.40                               | 1.96       | 0.423              | 0.190 | ECOS2DB471BA             |
| 680                            | 22 x 40            | 1.70                               | 2.38       | 0.293              | 0.132 | ECOS2CB681BA             | 560                            | 22 x 40            | 1.50                               | 2.10       | 0.355              | 0.160 | ECOS2DB561BA             |
| 820                            | 22 x 45            | 2.00                               | 2.80       | 0.243              | 0.109 | ECOS2CB821BA             | 680                            | 22 x 45            | 1.70                               | 2.38       | 0.293              | 0.132 | ECOS2DB681BA             |
| 1000                           | 22 x 50            | 2.20                               | 3.08       | 0.199              | 0.090 | ECOS2CB102BA             | 390                            | 25 x 25            | 1.30                               | 1.82       | 0.510              | 0.230 | ECOS2DB391CA             |
| 680                            | 25 x 30            | 1.70                               | 2.38       | 0.293              | 0.132 | ECOS2CB681CA             | 470                            | 25 x 30            | 1.40                               | 1.96       | 0.423              | 0.190 | ECOS2DB471CA             |
| 820                            | 25 x 35            | 2.00                               | 2.80       | 0.243              | 0.109 | ECOS2CB821CA             | 560                            | 25 x 30            | 1.50                               | 2.10       | 0.355              | 0.160 | ECOS2DB561CA             |
| 1000                           | 25 x 40            | 2.20                               | 3.08       | 0.199              | 0.090 | ECOS2CB102CA             | 680                            | 25 x 35            | 1.70                               | 2.38       | 0.293              | 0.132 | ECOS2DB681CA             |
| 1200                           | 25 x 45            | 2.30                               | 3.22       | 0.180              | 0.090 | ECOS2CB122CA             | 820                            | 25 x 45            | 2.00                               | 2.80       | 0.263              | 0.118 | ECOS2DB821CA             |
| 1000                           | 30 x 30            | 2.20                               | 3.08       | 0.199              | 0.090 | ECOS2CB102DA             | 1000                           | 25 x 50            | 2.20                               | 3.08       | 0.216              | 0.108 | ECOS2DB102CA             |
| 1200                           | 30 x 35            | 2.30                               | 3.22       | 0.180              | 0.090 | ECOS2CB122DA             | 560                            | 30 x 25            | 1.50                               | 2.10       | 0.355              | 0.160 | ECOS2DB561DA             |
| 1500                           | 30 x 40            | 2.50                               | 3.50       | 0.144              | 0.072 | ECOS2CB152DA             | 820                            | 30 x 30            | 2.00                               | 2.80       | 0.263              | 0.118 | ECOS2DB821DA             |
| 1800                           | 30 x 45            | 2.70                               | 3.78       | 0.129              | 0.064 | ECOS2CB182DA             | 1000                           | 30 x 35            | 2.20                               | 3.08       | 0.216              | 0.108 | ECOS2DB102DA             |
| 1000                           | 35 x 25            | 2.20                               | 3.08       | 0.199              | 0.090 | ECOS2CB102EA             | 1200                           | 30 x 40            | 2.30                               | 3.22       | 0.193              | 0.097 | ECOS2DB122DA             |
| 1200                           | 35 x 30            | 2.30                               | 3.22       | 0.180              | 0.090 | ECOS2CB122EA             | 1500                           | 30 x 50            | 2.50                               | 3.50       | 0.155              | 0.077 | ECOS2DB152DA             |
| 1500                           | 35 x 30            | 2.50                               | 3.50       | 0.144              | 0.072 | ECOS2CB152EA             | 820                            | 35 x 25            | 2.00                               | 2.80       | 0.263              | 0.118 | ECOS2DB821EA             |
| 1800                           | 35 x 35            | 2.70                               | 3.78       | 0.129              | 0.064 | ECOS2CB182EA             | 1000                           | 35 x 30            | 2.20                               | 3.08       | 0.216              | 0.108 | ECOS2DB102EA             |
| 2200                           | 35 x 45            | 2.90                               | 4.06       | 0.105              | 0.063 | ECOS2CB222EA             | 1200                           | 35 x 35            | 2.30                               | 3.22       | 0.193              | 0.097 | ECOS2DB122EA             |
| 2700                           | 35 x 50            | 3.10                               | 4.34       | 0.086              | 0.052 | ECOS2CB272EA             | 1500                           | 35 x 40            | 2.50                               | 3.50       | 0.155              | 0.077 | ECOS2DB152EA             |
| 2200                           | 40 x 40            | 2.90                               | 4.06       | 0.105              | 0.063 | ECOS2CB222FA             | 1800                           | 35 x 45            | 2.70                               | 3.78       | 0.129              | 0.077 | ECOS2DB182EA             |
| 3300                           | 40 x 50            | 3.36                               | 4.70       | 0.070              | 0.042 | ECOS2CB332FA             | 2200                           | 35 x 50            | 2.90                               | 4.06       | 0.105              | 0.063 | ECOS2DB222EA             |
|                                |                    |                                    |            |                    |       |                          | 1800                           | 40 x 40            | 2.70                               | 3.78       | 0.129              | 0.077 | ECOS2DB182FA             |
|                                |                    |                                    |            |                    |       |                          | 2700                           | 40 x 50            | 3.55                               | 4.97       | 0.086              | 0.052 | ECOS2DB272FA             |

## TS-HB Standard Ratings (continued)

| Cap.<br>( $\mu\text{F}$ )      | Size (mm)<br>D x L | Max 105°C R.C. ( $A_{\text{rms}}$ ) |            | 20°C ESR ( $\Omega$ , max.) |       | Panasonic<br>Part Number |
|--------------------------------|--------------------|-------------------------------------|------------|-----------------------------|-------|--------------------------|
|                                |                    | 120Hz                               | 10k~100kHz | 120Hz                       | 20kHz |                          |
| 250 VDC Working, 300 VDC Surge |                    |                                     |            |                             |       |                          |
| 180                            | 22 x 25            | 0.90                                | 1.26       | 0.921                       | 0.461 | ECOS2EB181BA             |
| 220                            | 22 x 30            | 1.00                                | 1.40       | 0.754                       | 0.377 | ECOS2EB221BA             |
| 270                            | 22 x 35            | 1.10                                | 1.54       | 0.614                       | 0.307 | ECOS2EB271BA             |
| 330                            | 22 x 40            | 1.20                                | 1.68       | 0.502                       | 0.251 | ECOS2EB331BA             |
| 390                            | 22 x 45            | 1.30                                | 1.82       | 0.425                       | 0.213 | ECOS2EB391BA             |
| 470                            | 22 x 50            | 1.40                                | 1.96       | 0.353                       | 0.176 | ECOS2EB471BA             |
| 330                            | 25 x 30            | 1.20                                | 1.68       | 0.502                       | 0.251 | ECOS2EB331CA             |
| 470                            | 25 x 40            | 1.40                                | 1.96       | 0.353                       | 0.176 | ECOS2EB471CA             |
| 560                            | 25 x 45            | 1.50                                | 2.10       | 0.296                       | 0.148 | ECOS2EB561CA             |
| 680                            | 25 x 50            | 1.70                                | 2.38       | 0.244                       | 0.134 | ECOS2EB681CA             |
| 390                            | 30 x 25            | 1.30                                | 1.82       | 0.425                       | 0.213 | ECOS2EB391DA             |
| 470                            | 30 x 30            | 1.40                                | 1.96       | 0.353                       | 0.176 | ECOS2EB471DA             |
| 680                            | 30 x 40            | 1.70                                | 2.38       | 0.244                       | 0.134 | ECOS2EB681DA             |
| 820                            | 30 x 45            | 2.00                                | 2.80       | 0.202                       | 0.111 | ECOS2EB821DA             |
| 1000                           | 30 x 50            | 2.20                                | 3.08       | 0.199                       | 0.109 | ECOS2EB102DA             |
| 560                            | 35 x 25            | 1.50                                | 2.10       | 0.296                       | 0.148 | ECOS2EB561EA             |
| 680                            | 35 x 30            | 1.70                                | 2.38       | 0.244                       | 0.134 | ECOS2EB681EA             |
| 820                            | 35 x 35            | 2.00                                | 2.80       | 0.202                       | 0.111 | ECOS2EB821EA             |
| 1000                           | 35 x 40            | 2.20                                | 3.08       | 0.199                       | 0.109 | ECOS2EB102EA             |
| 1200                           | 35 x 45            | 2.30                                | 3.22       | 0.166                       | 0.099 | ECOS2EB122EA             |
| 1500                           | 35 x 50            | 2.50                                | 3.50       | 0.144                       | 0.093 | ECOS2EB152EA             |
| 1200                           | 40 x 40            | 2.66                                | 3.72       | 0.180                       | 0.117 | ECOS2EB122FA             |
| 1800                           | 40 x 50            | 3.25                                | 4.55       | 0.120                       | 0.078 | ECOS2EB182FA             |
| 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             |
| 120                            | 22 x 35            | 0.75                                | 1.05       | 1.382                       | 0.484 | ECOS2GB121BA             |
| 150                            | 22 x 40            | 0.82                                | 1.15       | 1.105                       | 0.387 | ECOS2GB151BA             |
| 180                            | 22 x 45            | 0.95                                | 1.33       | 0.921                       | 0.322 | ECOS2GB181BA             |
| 100                            | 25 x 25            | 0.69                                | 0.97       | 1.658                       | 0.580 | ECOS2GB101CA             |
| 120                            | 25 x 30            | 0.75                                | 1.05       | 1.382                       | 0.484 | ECOS2GB121CA             |
| 150                            | 25 x 30            | 0.82                                | 1.15       | 1.105                       | 0.387 | ECOS2GB151CA             |
| 180                            | 25 x 35            | 0.95                                | 1.33       | 0.921                       | 0.322 | ECOS2GB181CA             |
| 220                            | 25 x 45            | 1.10                                | 1.54       | 0.754                       | 0.264 | ECOS2GB221CA             |
| 270                            | 25 x 50            | 1.20                                | 1.68       | 0.614                       | 0.215 | ECOS2GB271CA             |
| 150                            | 30 x 25            | 0.82                                | 1.15       | 1.105                       | 0.387 | ECOS2GB151DA             |
| 180                            | 30 x 30            | 0.95                                | 1.33       | 0.921                       | 0.322 | ECOS2GB181DA             |
| 220                            | 30 x 30            | 1.10                                | 1.54       | 0.754                       | 0.264 | ECOS2GB221DA             |
| 270                            | 30 x 35            | 1.20                                | 1.68       | 0.614                       | 0.215 | ECOS2GB271DA             |
| 330                            | 30 x 45            | 1.35                                | 1.89       | 0.502                       | 0.201 | ECOS2GB331DA             |
| 390                            | 30 x 50            | 1.55                                | 2.17       | 0.425                       | 0.170 | ECOS2GB391DA             |
| 220                            | 35 x 25            | 1.10                                | 1.54       | 0.754                       | 0.264 | ECOS2GB221EA             |
| 270                            | 35 x 30            | 1.20                                | 1.68       | 0.614                       | 0.215 | ECOS2GB271EA             |
| 330                            | 35 x 35            | 1.35                                | 1.89       | 0.502                       | 0.201 | ECOS2GB331EA             |
| 390                            | 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             |
| 470                            | 40 x 40            | 1.75                                | 2.45       | 0.353                       | 0.141 | ECOS2GB471FA             |
| 680                            | 40 x 50            | 2.10                                | 2.94       | 0.244                       | 0.098 | ECOS2GB681FA             |
| 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             |
| 120                            | 22 x 35            | 0.75                                | 1.05       | 1.382                       | 0.553 | ECOS2TB121BA             |
| 150                            | 22 x 40            | 0.82                                | 1.15       | 1.105                       | 0.442 | ECOS2TB151BA             |
| 180                            | 22 x 45            | 0.95                                | 1.33       | 0.921                       | 0.368 | ECOS2TB181BA             |
| 100                            | 25 x 25            | 0.69                                | 0.97       | 1.658                       | 0.663 | ECOS2TB101CA             |
| 120                            | 25 x 30            | 0.75                                | 1.05       | 1.382                       | 0.553 | ECOS2TB121CA             |
| 150                            | 25 x 30            | 0.82                                | 1.15       | 1.105                       | 0.442 | ECOS2TB151CA             |
| 180                            | 25 x 35            | 0.95                                | 1.33       | 0.921                       | 0.368 | ECOS2TB181CA             |
| 220                            | 25 x 45            | 1.10                                | 1.54       | 0.754                       | 0.301 | ECOS2TB221CA             |
| 270                            | 25 x 50            | 1.20                                | 1.68       | 0.675                       | 0.270 | ECOS2TB271CA             |
| 150                            | 30 x 25            | 0.82                                | 1.15       | 1.105                       | 0.442 | ECOS2TB151DA             |
| 180                            | 30 x 30            | 0.95                                | 1.33       | 0.921                       | 0.368 | ECOS2TB181DA             |
| 220                            | 30 x 30            | 1.10                                | 1.54       | 0.829                       | 0.332 | ECOS2TB221DA             |
| 330                            | 30 x 45            | 1.35                                | 1.89       | 0.553                       | 0.221 | ECOS2TB331DA             |
| 390                            | 30 x 50            | 1.55                                | 2.17       | 0.510                       | 0.204 | ECOS2TB391DA             |
| 220                            | 35 x 25            | 1.10                                | 1.54       | 0.829                       | 0.332 | ECOS2TB221EA             |
| 270                            | 35 x 30            | 1.20                                | 1.68       | 0.675                       | 0.270 | ECOS2TB271EA             |
| 330                            | 35 x 35            | 1.35                                | 1.89       | 0.553                       | 0.221 | ECOS2TB331EA             |
| 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             |
| 470                            | 40 x 40            | 1.75                                | 2.45       | 0.423                       | 0.212 | ECOS2TB471FA             |
| 680                            | 40 x 50            | 2.10                                | 2.94       | 0.293                       | 0.146 | ECOS2TB681FA             |
| 450 VDC Working, 500 VDC Surge |                    |                                     |            |                             |       |                          |
| 82                             | 22 x 30            | 0.56                                | 0.78       | 2.022                       | 0.708 | ECOS2WB820BA             |
| 100                            | 22 x 35            | 0.64                                | 0.90       | 1.658                       | 0.580 | ECOS2WB101BA             |
| 120                            | 22 x 40            | 0.72                                | 1.01       | 1.382                       | 0.484 | ECOS2WB121BA             |
| 150                            | 22 x 50            | 0.79                                | 1.11       | 1.105                       | 0.387 | ECOS2WB151BA             |
| 82                             | 25 x 25            | 0.56                                | 0.78       | 2.022                       | 0.708 | ECOS2WB820CA             |
| 100                            | 25 x 30            | 0.64                                | 0.90       | 1.658                       | 0.580 | ECOS2WB101CA             |
| 120                            | 25 x 35            | 0.72                                | 1.01       | 1.382                       | 0.484 | ECOS2WB121CA             |
| 150                            | 25 x 40            | 0.79                                | 1.11       | 1.105                       | 0.387 | ECOS2WB151CA             |
| 180                            | 25 x 45            | 0.87                                | 1.22       | 0.921                       | 0.322 | ECOS2WB181CA             |
| 220                            | 25 x 50            | 1.00                                | 1.40       | 0.754                       | 0.264 | ECOS2WB221CA             |
| 120                            | 30 x 25            | 0.72                                | 1.01       | 1.382                       | 0.484 | ECOS2WB121DA             |
| 150                            | 30 x 30            | 0.79                                | 1.11       | 1.105                       | 0.387 | ECOS2WB151DA             |
| 180                            | 30 x 35            | 0.87                                | 1.22       | 0.921                       | 0.322 | ECOS2WB181DA             |
| 220                            | 30 x 40            | 1.00                                | 1.40       | 0.754                       | 0.264 | ECOS2WB221DA             |
| 270                            | 30 x 45            | 1.19                                | 1.67       | 0.614                       | 0.215 | ECOS2WB271DA             |
| 330                            | 30 x 50            | 1.38                                | 1.93       | 0.502                       | 0.176 | ECOS2WB331DA             |
| 150                            | 35 x 25            | 0.79                                | 1.11       | 1.105                       | 0.387 | ECOS2WB151EA             |
| 220                            | 35 x 30            | 1.00                                | 1.40       | 0.754                       | 0.264 | ECOS2WB221EA             |
| 270                            | 35 x 35            | 1.19                                | 1.67       | 0.614                       | 0.215 | ECOS2WB271EA             |
| 330                            | 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             |
| 470                            | 35 x 50            | 1.74                                | 2.44       | 0.353                       | 0.123 | ECOS2WB471EA             |
| 390                            | 40 x 40            | 1.68                                | 2.35       | 0.425                       | 0.170 | ECOS2WB391FA             |
| 560                            | 40 x 50            | 2.17                                | 3.04       | 0.296                       | 0.118 | ECOS2WB561FA             |