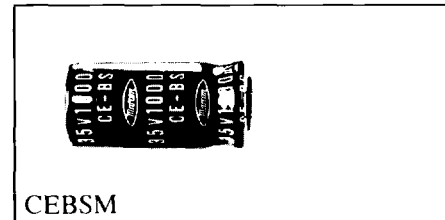


## CEBSM SERIES

MINIATURE RADIAL TYPE FOR +105°C

### • FEATURES

1. Miniaturized, 1 ~ 2 rank smaller than USM series.
2. Suitable for miniaturizing electronic equipment.
3. 105°C, 1000 hours guaranteed.
4. Washable with Freon TE, TES, TMS for 5 minutes for rated voltage  $\leq$  250VDC



CEBSM

### • GENERAL SPECIFICATIONS

Operating temperature range -40°C ~ +105°C

Rated voltage range 6.3WV ~ 250WV

Nominal capacitance range 0.1  $\mu$ F ~ 15,000  $\mu$ F

Capacitance tolerance  $\pm$ 20%  
(At 20°C, 120 Hz)

Max. ripple current See standard rating table  
(At 105°C, 120 Hz)

Leakage current  $I \leq 0.01CV$  or  $3\mu A$  (whichever is greater); 6.3 to 100WV  
(At 20°C, after 2 minutes)  $I \leq 0.01CV + 10\mu A$ ; 160 to 250WV  
I : Leakage Current ( $\mu A$ ), C: Nominal capacitance ( $\mu F$ ),  
V: Rated voltage (VDC)

Tangent of loss angle Shall not exceed the following value.  
 $\tan \delta$  (At 20°C, 120 Hz)

| RV (VDC)               | 6.3  | 10   | 16   | 25   | 35   | 50 ~ 63 | 100  | 160 ~ 250 |
|------------------------|--|------|------|------|------|---------|------|-----------|
| 1000 $\mu$ F or less   | 0.24   | 0.20 | 0.17 | 0.15 | 0.12 | 0.10    | 0.08 | 0.12      |
| More than 1000 $\mu$ F | Add .02 to above value for every 1000 $\mu$ F or less. |      |      |      |      |         |      |           |

Impedance ratio at low temperature Shall not exceed the following value.  
(At 120 Hz)

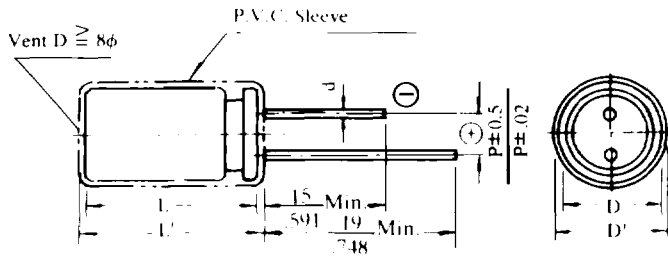
| RV (VDC)   | 6.3 | 10 | 16 | 25 | 35 ~ 100 | 160 ~ 250 |
|------------|-----|----|----|----|----------|-----------|
| -25°C/20°C | 4   | 3  | 2  | 2  | 2        | 2         |
| -40°C/20°C | 10  | 8  | 6  | 4  | 3        | 3         |

Life test At 105°C  $\pm$ 2°C for a period of 1,000 hours with rated voltage.

|                    |  |
|--------------------|--|
| Capacitance change | $\leq \pm 30\%$ of initial value ; 6.3 to 16WV<br>$\leq \pm 25\%$ of initial value ; 25 to 250WV |
| Leakage current    | Same as specified value in this table or less  |
| Tan $\delta$       | 150% or less of the value in this table  |

Standard JIS C 5141(1982) characteristic W

● Dimensions



• mm  $L \leq 16$ :  $L' = (L + 1.0)$  Max  
 $L > 16$ :  $L' = (L + 2.0)$  Max  
 $D' = (D + 0.5)$  Max

• Inches  $L \leq 6.30$ :  $L' = (L + .039)$  Max  
 $L > 6.30$ :  $L' = (L + .079)$  Max  
 $D' = (D + .020)$  Max

**DIMENSION** Unit =  $\frac{mm}{inch}$

| Dφ  | 5    | 6.3  | 8    | 10   | 13   | 16   | 18   |
|-----|------|------|------|------|------|------|------|
|     |      | .197 | .248 | .315 | .394 | .512 | .620 |
| P   | 2.0  | 2.5  | 3.5  | 5.0  | 5.0  | 7.5  | 7.5  |
|     | .078 | .098 | .138 | .197 | .197 | .295 | .295 |
| dφ  | 0.5  | 0.5  | 0.6  | 0.6  | 0.6  | 0.8  | 0.8  |
|     | .020 | .020 | .024 | .024 | .024 | .031 | .031 |
| AWG | 24   | 24   | 23   | 23   | 23   | 20   | 20   |

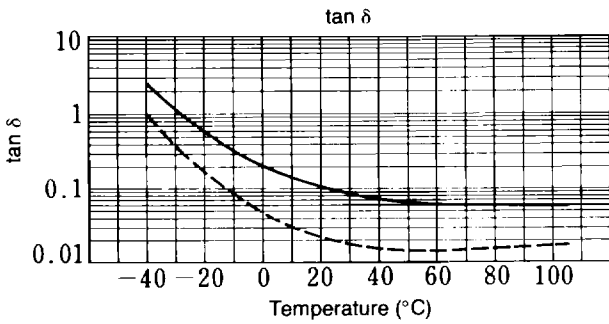
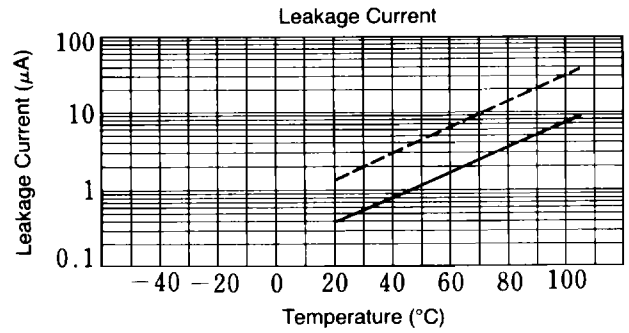
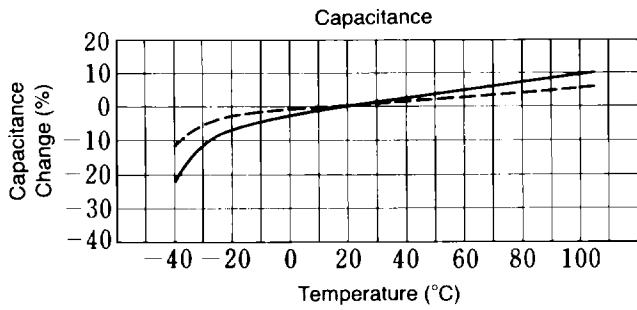
| Part No     | W V (DC) | Cap (μF)<br>@ 120Hz, 20°C | Max Leakage<br>(μA)@ 20°C | Max ESR(Ω)<br>@ 120Hz, 20°C | Max Ripple (mA)<br>@ 120Hz, 105°C | Nominal Case Size |              |
|-------------|----------|---------------------------|---------------------------|-----------------------------|-----------------------------------|-------------------|--------------|
|             |          |                           |                           |                             |                                   | DxL (mm)          | DxL (inches) |
| CEBSM0J101M | 6.3      | 100                       | 63                        | 3.98                        | 80                                | 5 x 11            | .197 x .433  |
| CEBSM0J221M | 6.3      | 220                       | 13.9                      | 1.81                        | 142                               | 6.3 x 11          | .248 x .433  |
| CEBSM0J331M | 6.3      | 330                       | 20.8                      | 1.21                        | 180                               | 6.3 x 11          | .248 x .433  |
| CEBSM0J471M | 6.3      | 470                       | 29.6                      | 0.847                       | 240                               | 8 x 11.5          | .315 x .453  |
| CEBSM0J102M | 6.3      | 1,000                     | 63                        | 0.398                       | 420                               | 10 x 12.5         | .394 x .492  |
| CEBSM0J222M | 6.3      | 2,200                     | 139                       | 0.211                       | 760                               | 13 x 20           | .512 x .787  |
| CEBSM0J332M | 6.3      | 3,300                     | 208                       | 0.151                       | 920                               | 13 x 20           | .512 x .787  |
| CEBSM0J472M | 6.3      | 4,700                     | 296                       | 0.113                       | 1,200                             | 16 x 25           | .630 x .984  |
| CEBSM0J682M | 6.3      | 6,800                     | 428                       | 0.0878                      | 1,350                             | 16 x 25           | .630 x .984  |
| CEBSM0J103M | 6.3      | 10,000                    | 630                       | 0.0696                      | 1,520                             | 16 x 31.5         | .630 x 1.24  |
| CEBSM0J153M | 6.3      | 15,000                    | 945                       | 0.0575                      | 1,860                             | 18 x 35.5         | .709 x 1.40  |
| CEBSM1A220M | 10       | 22                        | 3                         | 15.1                        | 41                                | 5 x 11            | .197 x .433  |
| CEBSM1A330M | 10       | 33                        | 3.3                       | 10.0                        | 50                                | 5 x 11            | .197 x .433  |
| CEBSM1A470M | 10       | 47                        | 4.7                       | 7.05                        | 59                                | 5 x 11            | .197 x .433  |
| CEBSM1A101M | 10       | 100                       | 10                        | 3.32                        | 88                                | 5 x 11            | .197 x .433  |
| CEBSM1A221M | 10       | 220                       | 22                        | 1.51                        | 150                               | 6.3 x 11          | .248 x .433  |
| CEBSM1A331M | 10       | 330                       | 33                        | 1.00                        | 210                               | 8 x 11.5          | .315 x .453  |
| CEBSM1A471M | 10       | 470                       | 47                        | 0.705                       | 270                               | 8 x 11.5          | .315 x .453  |
| CEBSM1A102M | 10       | 1,000                     | 100                       | 0.332                       | 480                               | 10 x 16           | .394 x .630  |
| CEBSM1A222M | 10       | 2,200                     | 220                       | 0.181                       | 810                               | 13 x 20           | .512 x .787  |
| CEBSM1A332M | 10       | 3,300                     | 330                       | 0.131                       | 1,040                             | 13 x 25           | .512 x .984  |
| CEBSM1A472M | 10       | 4,700                     | 470                       | 0.0988                      | 1,240                             | 16 x 25           | .630 x .984  |
| CEBSM1A682M | 10       | 6,800                     | 680                       | 0.0780                      | 1,530                             | 16 x 31.5         | .630 x 1.24  |
| CEBSM1A103M | 10       | 10,000                    | 1,000                     | 0.0630                      | 1,780                             | 18 x 35.5         | .709 x 1.40  |
| CEBSM1C100M | 16       | 10                        | 3                         | 28.2                        | 32                                | 5 x 11            | .197 x .433  |
| CEBSM1C220M | 16       | 22                        | 3.5                       | 12.8                        | 45                                | 5 x 11            | .197 x .433  |
| CEBSM1C330M | 16       | 33                        | 5.3                       | 8.54                        | 56                                | 5 x 11            | .197 x .433  |
| CEBSM1C470M | 16       | 47                        | 7.5                       | 6.00                        | 68                                | 5 x 11            | .197 x .433  |
| CEBSM1C101M | 16       | 100                       | 16                        | 2.82                        | 110                               | 6.3 x 11          | .248 x .433  |
| CEBSM1C221M | 16       | 220                       | 35.2                      | 1.28                        | 200                               | 8 x 11.5          | .315 x .453  |
| CEBSM1C331M | 16       | 330                       | 52.8                      | 0.854                       | 250                               | 8 x 11.5          | .315 x .453  |
| CEBSM1C471M | 16       | 470                       | 75.2                      | 0.600                       | 340                               | 10 x 12.5         | .394 x .492  |
| CEBSM1C102M | 16       | 1,000                     | 160                       | 0.282                       | 570                               | 10 x 20           | .394 x .787  |
| CEBSM1C222M | 16       | 2,200                     | 352                       | 0.158                       | 970                               | 13 x 25           | .512 x .984  |
| CEBSM1C332M | 16       | 3,300                     | 528                       | 0.116                       | 1,230                             | 16 x 25           | .630 x .984  |
| CEBSM1C472M | 16       | 4,700                     | 752                       | 0.0882                      | 1,480                             | 16 x 31.5         | .630 x 1.24  |
| CEBSM1C682M | 16       | 6,800                     | 1,088                     | 0.0707                      | 1,750                             | 18 x 35.5         | .709 x 1.40  |

| Part No.    | W V (DC) | Cap. (μF)<br>@ 120Hz, 20°C | Max. Leakage<br>(μA)@20°C | Max ESR(Ω)<br>@ 120Hz, 20°C | Max. Ripple (mA)<br>@ 120Hz, 105°C | Nominal Case Size |              |
|-------------|----------|----------------------------|---------------------------|-----------------------------|------------------------------------|-------------------|--------------|
|             |          |                            |                           |                             |                                    | DxL (mm)          | DxL (inches) |
| CEBSM1E100M | 25       | 10                         | 3                         | 24.9                        | 34                                 | 5 x 11            | 197 x 433    |
| CEBSM1E220M | 25       | 22                         | 5.5                       | 11.3                        | 50                                 | 5 x 11            | 197 x 433    |
| CEBSM1E330M | 25       | 33                         | 8.3                       | 7.54                        | 61                                 | 5 x 11            | 197 x 433    |
| CEBSM1E470M | 25       | 47                         | 11.8                      | 5.29                        | 74                                 | 5 x 11            | 197 x 433    |
| CEBSM1E101M | 25       | 100                        | 25                        | 2.49                        | 125                                | 6.3 x 11          | 248 x 433    |
| CEBSM1E221M | 25       | 220                        | 55                        | 1.13                        | 220                                | 8 x 11.5          | 315 x 453    |
| CEBSM1E331M | 25       | 330                        | 82.5                      | 0.754                       | 310                                | 10 x 12.5         | 394 x 492    |
| CEBSM1E471M | 25       | 470                        | 118                       | 0.529                       | 400                                | 10 x 16           | 394 x 630    |
| CEBSM1E102M | 25       | 1,000                      | 250                       | 0.249                       | 680                                | 13 x 20           | 512 x 787    |
| CEBSM1E222M | 25       | 2,200                      | 550                       | 0.143                       | 1,100                              | 16 x 25           | 630 x 984    |
| CEBSM1E332M | 25       | 3,300                      | 825                       | 0.105                       | 1,370                              | 16 x 31.5         | 630 x 1.24   |
| CEBSM1E472M | 25       | 4,700                      | 1,175                     | 0.0811                      | 1,650                              | 18 x 31.5         | 709 x 1.24   |
| CEBSM1V3R3M | 35       | 33                         | 3                         | 60.3                        | 20                                 | 5 x 11            | 197 x 433    |
| CEBSM1V4R7M | 35       | 47                         | 3                         | 42.3                        | 24                                 | 5 x 11            | 197 x 433    |
| CEBSM1V100M | 35       | 10                         | 3.5                       | 19.9                        | 34                                 | 5 x 11            | 197 x 433    |
| CEBSM1V220M | 35       | 22                         | 7.7                       | 9.04                        | 54                                 | 5 x 11            | 197 x 433    |
| CEBSM1V330M | 35       | 33                         | 11.6                      | 6.03                        | 68                                 | 5 x 11            | 197 x 433    |
| CEBSM1V470M | 35       | 47                         | 16.5                      | 4.23                        | 90                                 | 6.3 x 11          | 248 x 433    |
| CEBSM1V101M | 35       | 100                        | 35                        | 1.99                        | 150                                | 8 x 11.5          | 315 x 453    |
| CEBSM1V221M | 35       | 220                        | 77                        | 0.904                       | 270                                | 10 x 12.5         | 394 x 492    |
| CEBSM1V331M | 35       | 330                        | 116                       | 0.603                       | 360                                | 10 x 16           | 394 x 630    |
| CEBSM1V471M | 35       | 470                        | 165                       | 0.423                       | 460                                | 10 x 20           | 394 x 787    |
| CEBSM1V102M | 35       | 1,000                      | 350                       | 0.199                       | 780                                | 13 x 25           | 512 x 984    |
| CEBSM1V222M | 35       | 2,200                      | 770                       | 0.121                       | 1,280                              | 16 x 31.5         | 630 x 1.24   |
| CEBSM1V332M | 35       | 3,300                      | 1,155                     | 0.0904                      | 1,600                              | 18 x 35.5         | 709 x 1.40   |
| CEBSM1HR10M | 50       | 0.1                        | 3                         | 1,658                       | 4                                  | 5 x 11            | 197 x 433    |
| CEBSM1HR22M | 50       | 0.22                       | 3                         | 754                         | 6                                  | 5 x 11            | 197 x 433    |
| CEBSM1HR33M | 50       | 0.33                       | 3                         | 502                         | 7                                  | 5 x 11            | 197 x 433    |
| CEBSM1HR47M | 50       | 0.47                       | 3                         | 353                         | 8                                  | 5 x 11            | 197 x 433    |
| CEBSM1H010M | 50       | 1                          | 3                         | 166                         | 12                                 | 5 x 11            | 197 x 433    |
| CEBSM1H2R2M | 50       | 2.2                        | 3                         | 75.4                        | 18                                 | 5 x 11            | 197 x 433    |
| CEBSM1H3R3M | 50       | 3.3                        | 3                         | 50.2                        | 21                                 | 5 x 11            | 197 x 433    |
| CEBSM1H4R7M | 50       | 4.7                        | 3                         | 35.3                        | 27                                 | 5 x 11            | 197 x 433    |
| CEBSM1H100M | 50       | 10                         | 5                         | 16.6                        | 39                                 | 5 x 11            | 197 x 433    |
| CEBSM1H220M | 50       | 22                         | 11                        | 7.54                        | 61                                 | 5 x 11            | 197 x 433    |
| CEBSM1H330M | 50       | 33                         | 16.5                      | 5.02                        | 81                                 | 6.3 x 11          | 248 x 433    |
| CEBSM1H470M | 50       | 47                         | 23.5                      | 3.53                        | 100                                | 6.3 x 11          | 248 x 433    |
| CEBSM1H101M | 50       | 100                        | 50                        | 1.66                        | 170                                | 8 x 11.5          | 315 x 453    |
| CEBSM1H221M | 50       | 220                        | 110                       | 0.754                       | 320                                | 10 x 16           | 394 x 630    |
| CEBSM1H331M | 50       | 330                        | 165                       | 0.502                       | 420                                | 10 x 20           | 394 x 787    |
| CEBSM1H471M | 50       | 470                        | 235                       | 0.353                       | 560                                | 13 x 20           | 512 x 787    |
| CEBSM1H102M | 50       | 1,000                      | 500                       | 0.166                       | 940                                | 16 x 25           | 630 x 984    |
| CEBSM1H222M | 50       | 2,200                      | 1,100                     | 0.0904                      | 1,500                              | 18 x 35.5         | 709 x 1.40   |
| CEBSM1J4R7M | 63       | 4.7                        | 3                         | 35.3                        | 28                                 | 5 x 11            | 197 x 433    |
| CEBSM1J100M | 63       | 10                         | 6.3                       | 16.6                        | 40                                 | 5 x 11            | 197 x 433    |
| CEBSM1J220M | 63       | 22                         | 13.9                      | 7.54                        | 70                                 | 6.3 x 11          | 248 x 433    |
| CEBSM1J330M | 63       | 33                         | 20.8                      | 5.02                        | 87                                 | 6.3 x 11          | 248 x 433    |
| CEBSM1J470M | 63       | 47                         | 29.6                      | 3.53                        | 120                                | 8 x 11.5          | 315 x 453    |
| CEBSM1J101M | 63       | 100                        | 63                        | 1.66                        | 210                                | 10 x 12.5         | 394 x 492    |
| CEBSM1J221M | 63       | 220                        | 139                       | 0.754                       | 370                                | 10 x 20           | 394 x 787    |
| CEBSM1J331M | 63       | 330                        | 208                       | 0.502                       | 510                                | 13 x 20           | 512 x 787    |
| CEBSM1J471M | 63       | 470                        | 296                       | 0.353                       | 630                                | 13 x 25           | 512 x 984    |
| CEBSM1J102M | 63       | 1,000                      | 630                       | 0.166                       | 1,100                              | 16 x 31.5         | 630 x 1.24   |

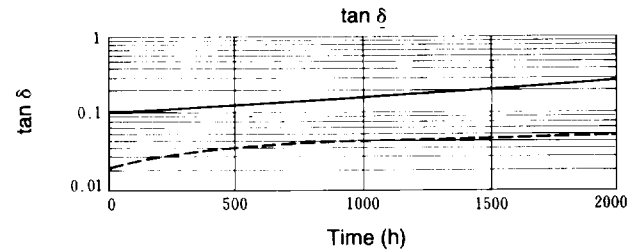
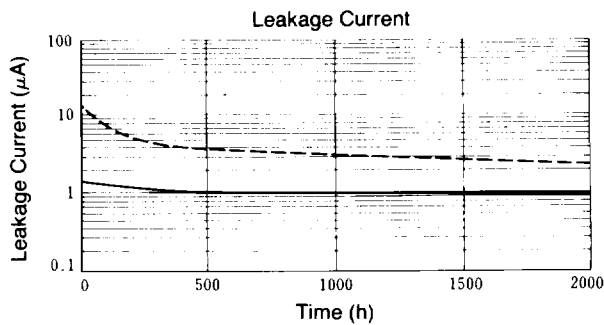
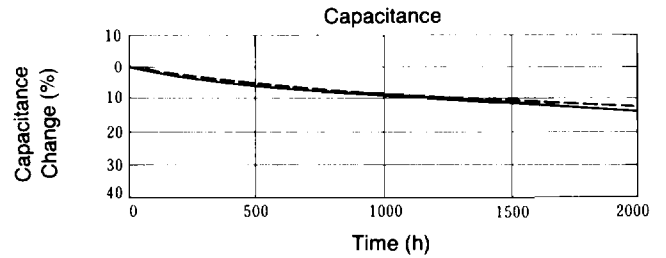
| Part No.     | W.V. (DC) | Cap ( $\mu$ F)<br>@120Hz, 20°C | Max. Leakage<br>( $\mu$ A)@20°C | Max ESR( $\Omega$ )<br>@ 120Hz, 20°C | Max. Ripple (mA)<br>@ 120Hz, 105°C | Nominal Case Size |              |
|--------------|-----------|--------------------------------|---------------------------------|--------------------------------------|------------------------------------|-------------------|--------------|
|              |           |                                |                                 |                                      |                                    | DxL (mm)          | DxL (inches) |
| CEBSM2AR47M  | 100       | 0.47                           | 3                               | 282                                  | 9                                  | 5 x 11            | .197 x .433  |
| CEBSM2A010M  | 100       | 1                              | 3                               | 133                                  | 13                                 | 5 x 11            | .197 x .433  |
| CEBSM2A2R2M  | 100       | 2.2                            | 3                               | 60.3                                 | 20                                 | 5 x 11            | .197 x .433  |
| CEBSM2A3R3M  | 100       | 3.3                            | 3.3                             | 40.2                                 | 24                                 | 5 x 11            | .197 x .433  |
| CEBSM2A4R7M  | 100       | 4.7                            | 4.7                             | 28.2                                 | 30                                 | 5 x 11            | .197 x .433  |
| CEBSM2A100M  | 100       | 10                             | 10                              | 13.3                                 | 50                                 | 6.3 x 11          | .248 x .433  |
| CEBSM2A220M  | 100       | 22                             | 22                              | 6.03                                 | 87                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2A330M  | 100       | 33                             | 33                              | 4.02                                 | 120                                | 10 x 12.5         | .394 x .492  |
| CEBSM2A470M  | 100       | 47                             | 47                              | 2.82                                 | 170                                | 10 x 16           | .394 x .630  |
| CEBSM2A101M  | 100       | 100                            | 100                             | 1.33                                 | 290                                | 13 x 20           | .394 x .787  |
| CEBSM2A221M  | 100       | 220                            | 220                             | 0.603                                | 500                                | 16 x 25           | .630 x .984  |
| CEBSM2A331M  | 100       | 330                            | 330                             | 0.402                                | 620                                | 16 x 25           | .630 x .984  |
| CEBSM2A471M  | 100       | 470                            | 470                             | 0.282                                | 780                                | 16 x 31.5         | .630 x 1.24  |
| CEBSM2C3R3M1 | 160       | 3.3                            | 15.3                            | 60.3                                 | 19                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2C4R7M1 | 160       | 4.7                            | 17.5                            | 42.3                                 | 24                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2C100M  | 160       | 10                             | 26                              | 19.9                                 | 45                                 | 10 x 16           | .394 x .630  |
| CEBSM2C220M  | 160       | 22                             | 45.2                            | 9.04                                 | 75                                 | 10 x 20           | .394 x .787  |
| CEBSM2C330M  | 160       | 33                             | 62.8                            | 6.03                                 | 105                                | 13 x 20           | .512 x .787  |
| CEBSM2C470M  | 160       | 47                             | 85.2                            | 4.23                                 | 140                                | 13 x 25           | .512 x .984  |
| CEBSM2C101M  | 160       | 100                            | 170                             | 1.99                                 | 220                                | 16 x 25           | .630 x .984  |
| CEBSM2C221M  | 160       | 220                            | 362                             | 0.904                                | 360                                | 18 x 35.5         | .709 x 1.40  |
| CEBSM2D010M1 | 200       | 1                              | 12                              | 199                                  | 10                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2D2R2M1 | 200       | 2.2                            | 14.4                            | 90.4                                 | 16                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2D3R3M1 | 200       | 3.3                            | 16.6                            | 60.3                                 | 20                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2D4R7M1 | 200       | 4.7                            | 19.4                            | 42.3                                 | 30                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2D100M  | 200       | 10                             | 30                              | 19.9                                 | 47                                 | 10 x 16           | .394 x .630  |
| CEBSM2D220M  | 200       | 22                             | 54                              | 9.04                                 | 78                                 | 10 x 20           | .394 x .787  |
| CEBSM2D330M  | 200       | 33                             | 76                              | 6.03                                 | 115                                | 13 x 20           | .512 x .787  |
| CEBSM2D470M  | 200       | 47                             | 104                             | 4.23                                 | 140                                | 13 x 25           | .512 x .984  |
| CEBSM2D101M  | 200       | 100                            | 210                             | 1.99                                 | 240                                | 16 x 31.5         | .630 x 1.24  |
| CEBSM2E2R2M1 | 250       | 2.2                            | 15.5                            | 90.4                                 | 17                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2E3R3M1 | 250       | 3.3                            | 18.3                            | 60.3                                 | 25                                 | 8 x 11.5          | .315 x .453  |
| CEBSM2E4R7M  | 250       | 4.7                            | 21.8                            | 42.3                                 | 30                                 | 10 x 16           | .394 x .630  |
| CEBSM2E100M  | 250       | 10                             | 35                              | 19.9                                 | 52                                 | 10 x 20           | .394 x .787  |
| CEBSM2E220M  | 250       | 22                             | 65                              | 9.04                                 | 95                                 | 13 x 20           | .512 x .787  |
| CEBSM2E330M  | 250       | 33                             | 92.5                            | 6.03                                 | 120                                | 13 x 25           | .512 x .984  |
| CEBSM2E470M  | 250       | 47                             | 128                             | 4.23                                 | 150                                | 16 x 25           | .630 x .984  |
| CEBSM2E101M  | 250       | 100                            | 260                             | 1.99                                 | 250                                | 16 x 35.5         | .630 x 1.40  |

• Technical Data

Temperature ——— 16V — 470 $\mu$ F  
 Characteristics - - - - 250V — 47 $\mu$ F



Life ——— 16V — 470 $\mu$ F  
 Characteristics - - - - 250V — 47 $\mu$ F



• Frequency Characteristics

