

# Type 330 -55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

## High Ripple and Ultra-Long Life

The Type 330 is the ultra-long-life version of the Type 300 capacitor. With an astonishing, 50,000-hour expected life operating continuously at full load and 65 °C the 330 is the choice for power supply outputs and UPS battery stiffening. The exceptionally low ESRs enable high ripple-current capability. With series inductance of 12 to 16 nH and ripple currents to 16 amps one of these capacitors can save by replacing three or four of the 12.5 mm diameter capacitors routinely at the output of switching power supplies. Type 330 R delivers even lower ESR and higher ripple. Type 330 has three leads for rugged, reverse-proof mounting. Two leads are available as Types 331 and 331R.



## Highlights

- Expected Life > 20 years @ 45 °C
- Ripple Current to 16 amps
- ESRs to 6 mΩ
- > 90% capacitance at -40 °C
- Replaces multiple capacitors

## RoHS Compliant

## Specifications

**Operating Temperature:**

-55 °C to +105 °C

**Rated Voltage:**

6.3 to 250 Vdc

**Capacitance:**

270 µF to 33,000 µF

**Capacitance Tolerance:**

6.3 to 100 Vdc; -10 + 75%, 160 to 250 Vdc; -10 + 50%

**Leakage Current:**

≤ 0.5  $\sqrt{CV}$  µA, 4 mA max, 5 min.

**Cold Impedance:**

-55 °C multiple of 25 °C  $Z \leq 4$  for 6.3 & 7.5 V, 3 for 10 to 50 V, 2 for > 50 V

**Ripple Current Multipliers:**

**Ambient Temperature**

| 45 °C | 55 °C | 65 °C | 75 °C | 85 °C | 95 °C | 105 °C |
|-------|-------|-------|-------|-------|-------|--------|
| 1.66  | 1.52  | 1.37  | 1.20  | 1.00  | 0.75  | 0.36   |

## Frequency

|                        | 50 Hz | 60 Hz | 120 Hz | 360 Hz | 1 kHz | 5 kHz | 10 kHz & up |
|------------------------|-------|-------|--------|--------|-------|-------|-------------|
| <b>.77" Diameter</b>   |       |       |        |        |       |       |             |
| <b>6.3 &amp; 7.5 V</b> | 0.82  | 0.86  | 1.00   | 1.15   | 1.21  | 1.24  | 1.25        |
| <b>10 to 40 V</b>      | 0.78  | 0.83  | 1.00   | 1.20   | 1.30  | 1.35  | 1.36        |
| <b>50V</b>             | 0.76  | 0.81  | 1.00   | 1.25   | 1.38  | 1.45  | 1.47        |
| <b>63 &amp; 75 V</b>   | 0.74  | 0.80  | 1.00   | 1.28   | 1.43  | 1.52  | 1.54        |
| <b>100 to 250 V</b>    | 0.76  | 0.81  | 1.00   | 1.24   | 1.37  | 1.44  | 1.46        |
| <b>.895" Diameter</b>  |       |       |        |        |       |       |             |
| <b>6.3 &amp; 7.5 V</b> | 0.82  | 0.86  | 1.00   | 1.14   | 1.20  | 1.23  | 1.24        |
| <b>10 to 40 V</b>      | 0.80  | 0.84  | 1.00   | 1.17   | 1.25  | 1.29  | 1.30        |
| <b>50V</b>             | 0.75  | 0.80  | 1.00   | 1.27   | 1.42  | 1.50  | 1.52        |
| <b>63 &amp; 75 V</b>   | 0.75  | 0.80  | 1.00   | 1.26   | 1.40  | 1.48  | 1.50        |
| <b>100 to 250 V</b>    | 0.76  | 0.81  | 1.00   | 1.25   | 1.38  | 1.46  | 1.48        |
| <b>1.02" Diameter</b>  |       |       |        |        |       |       |             |
| <b>6.3 &amp; 7.5 V</b> | 0.84  | 0.88  | 1.00   | 1.12   | 1.17  | 1.19  | 1.20        |
| <b>10 to 40 V</b>      | 0.81  | 0.86  | 1.00   | 1.15   | 1.22  | 1.25  | 1.26        |
| <b>50V</b>             | 0.76  | 0.81  | 1.00   | 1.23   | 1.35  | 1.42  | 1.44        |
| <b>63 &amp; 75 V</b>   | 0.77  | 0.81  | 1.00   | 1.23   | 1.35  | 1.42  | 1.44        |
| <b>100 to 250 V</b>    | 0.76  | 0.81  | 1.00   | 1.24   | 1.37  | 1.44  | 1.46        |

**Load Life:**

10,000 h at full load at 85 °C

Δ Capacitance ±20%

ESR 200% of limit

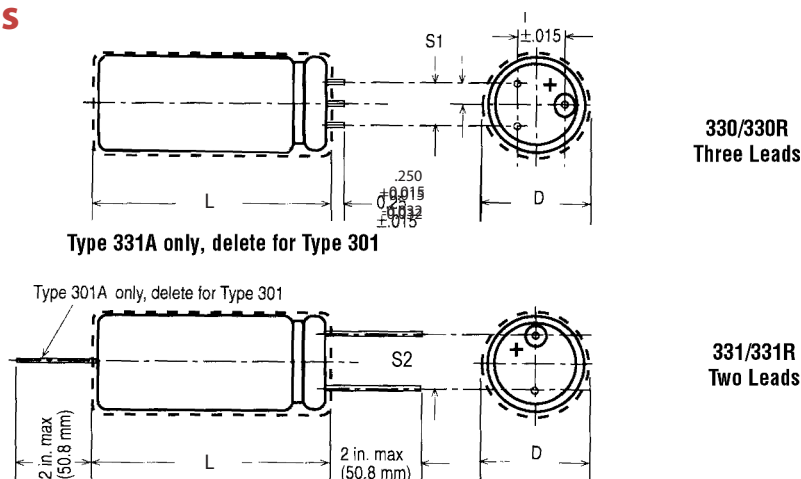
DCL 100% of limit

**Shelf Life:**

500 h at 105 °C, capacitance, ESR and DCL, initial requirements

# Type 330 –55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

## Outline Drawings



## Case Dimensions

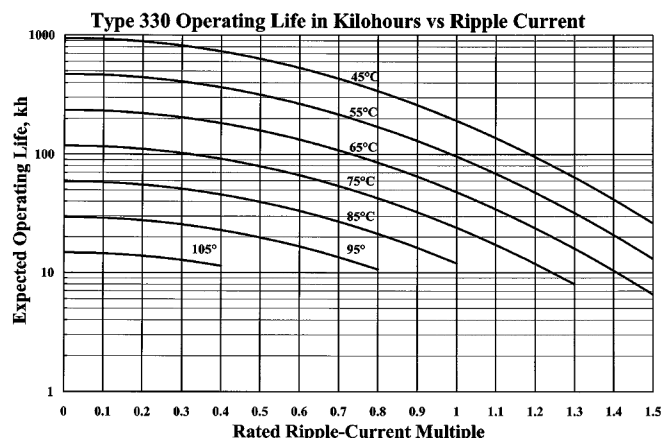
| Case Code                      | Insulated<br>D $\pm 0.015$ (0.4 mm)<br>L $\pm 0.062$ (1.6 mm)<br>D x L | Epoxy endseal<br>L Max<br>D x L | Bare Can<br>D $\pm 0.015$ (0.4 mm)<br>L $\pm 0.030$ (0.8 mm) | Lead Spacing   |                |                | Lead dia. | Diameter AWG |
|--------------------------------|------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------|----------------|----------------|----------------|-----------|--------------|
|                                |                                                                        |                                 |                                                              | Type 330<br>S1 | Type 331<br>T  | Type 331<br>S2 |           |              |
|                                |                                                                        |                                 |                                                              | 0.020 (0.5 mm) | 0.020 (0.5 mm) |                |           |              |
| Case Dimensions in Inches      |                                                                        |                                 |                                                              |                |                |                |           |              |
| GT                             | 0.765 x 3.650                                                          | 3.712                           | 0.750 x 3.625                                                | 0.200          | 0.300          | 0.300          | 0.040     | 18           |
| HP                             | 0.890 x 2.650                                                          | 2.712                           | 0.875 x 2.625                                                | 0.300          | 0.400          | 0.300          | 0.040     | 18           |
| HS                             | 0.890 x 3.150                                                          | 3.212                           | 0.875 x 3.125                                                | 0.300          | 0.400          | 0.300          | 0.040     | 18           |
| HT                             | 0.890 x 3.650                                                          | 3.712                           | 0.875 x 3.625                                                | 0.300          | 0.400          | 0.300          | 0.040     | 18           |
| JL                             | 1.015 x 2.150                                                          | 2.212                           | 1.000 x 2.125                                                | 0.300          | 0.400          | 0.400          | 0.040     | 18           |
| JP                             | 1.015 x 2.650                                                          | 2.712                           | 1.000 x 2.625                                                | 0.300          | 0.400          | 0.400          | 0.040     | 18           |
| JS                             | 1.015 x 3.150                                                          | 3.212                           | 1.000 x 3.125                                                | 0.300          | 0.400          | 0.400          | 0.040     | 18           |
| JT                             | 1.015 x 3.650                                                          | 3.712                           | 1.000 x 3.625                                                | 0.300          | 0.400          | 0.400          | 0.040     | 18           |
| Case Dimensions in Millimeters |                                                                        |                                 |                                                              |                |                |                |           |              |
| GT                             | 19.4 x 92.7                                                            | 94.3                            | 19.1 x 92.1                                                  | 5.08           | 7.62           | 7.62           | 1.02      | 18           |
| HP                             | 22.6 x 67.3                                                            | 68.9                            | 22.2 x 66.7                                                  | 7.62           | 10.16          | 7.62           | 1.02      | 18           |
| HS                             | 22.6 x 80.0                                                            | 81.6                            | 22.2 x 79.4                                                  | 7.62           | 10.16          | 7.62           | 1.02      | 18           |
| HT                             | 22.6 x 92.7                                                            | 94.3                            | 22.2 x 92.1                                                  | 7.62           | 10.16          | 7.62           | 1.02      | 18           |
| JL                             | 25.8 x 54.6                                                            | 56.2                            | 25.4 x 54.0                                                  | 7.62           | 10.16          | 10.16          | 1.02      | 18           |
| JP                             | 25.8 x 67.3                                                            | 68.9                            | 25.4 x 66.7                                                  | 7.62           | 10.16          | 10.16          | 1.02      | 18           |
| JS                             | 25.8 x 80.0                                                            | 81.6                            | 25.4 x 79.4                                                  | 7.62           | 10.16          | 10.16          | 1.02      | 18           |
| JT                             | 25.8 x 92.7                                                            | 94.3                            | 25.4 x 92.1                                                  | 7.62           | 10.16          | 10.16          | 1.02      | 18           |

## Part Numbering System

|                         |                       |             |            |                            |                    |   |
|-------------------------|-----------------------|-------------|------------|----------------------------|--------------------|---|
| 330R                    | 333                   | U           | 6R3        | JS                         | 2                  | E |
| Type                    | Capacitance Tolerance | Voltage     | Case Code  | Insulation                 | Epoxy              |   |
| 330 - 3 leads           | 100 = 10 $\mu$ F      | 6R3 = 6.3 V | See Rating | 0 = Bare Can               | (blank) = no epoxy |   |
| 330R - 3 leads          | 102 = 1000 $\mu$ F    | 063 = 63 V  |            | 1 = Polyester              | E = Epoxy          |   |
| Low ESR                 | M = $\pm 20\%$        | 100 = 100 V |            | 2 = PVC                    | endseal            |   |
| 331 - 2 leads           | T = $-10\% +50\%$     |             |            | 8 = PVC w/ Standoffs       |                    |   |
| 331R - 2 leads, Low ESR | U = $-10 +75\%$       |             |            | 9 = Polyester w/ Standoffs |                    |   |
| 331A - Laydown 3 leads  |                       |             |            |                            |                    |   |

# Type 330 –55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

## Typical Performance Curve



## Ratings

| Cap.<br>(μF)                  | Catalog<br>Part Number | ESR Max.<br>25 °C |                | Ripple Amps,<br>Max. 85 °C |               | Nominal<br>Size<br>D X L<br>(in) |
|-------------------------------|------------------------|-------------------|----------------|----------------------------|---------------|----------------------------------|
|                               |                        | 120 Hz<br>(mΩ)    | 20 kHz<br>(mΩ) | 120 Hz<br>(A)              | 20 kHz<br>(A) |                                  |
| <b>6.3 Vdc (9 Vdc Surge)</b>  |                        |                   |                |                            |               |                                  |
| 15000                         | 330153U6R3GT2          | 26.6              | 15.1           | 7.10                       | 8.86          | 0.77 X 3.65                      |
| 15000                         | 330R153U6R3GT2         | 23.0              | 13.1           | 7.62                       | 9.52          | 0.77 X 3.65                      |
| 15000                         | 330153U6R3HP2          | 27.1              | 16.5           | 6.57                       | 7.93          | 0.895 X 2.65                     |
| 15000                         | 330R153U6R3HP2         | 19.5              | 11.3           | 7.75                       | 9.60          | 0.895 X 2.65                     |
| 18000                         | 330183U6R3JL2          | 29.6              | 20.1           | 6.08                       | 6.95          | 1.02 X 2.15                      |
| 18000                         | 330R183U6R3JL2         | 19.1              | 10.9           | 7.57                       | 9.45          | 1.02 X 2.15                      |
| 22000                         | 330223U6R3HS2          | 22.4              | 13.7           | 7.88                       | 9.51          | 0.895 X 3.15                     |
| 22000                         | 330R223U6R3HS2         | 15.9              | 9.2            | 9.35                       | 11.60         | 0.895 X 3.15                     |
| 22000                         | 330223U6R3JP2          | 23.0              | 15.6           | 7.66                       | 8.75          | 1.02 X 2.65                      |
| 22000                         | 330R223U6R3JP2         | 14.7              | 8.4            | 9.59                       | 12.00         | 1.02 X 2.65                      |
| 27000                         | 330273U6R3HT2          | 19.4              | 11.9           | 9.04                       | 10.90         | 0.895 X 3.65                     |
| 27000                         | 330R273U6R3HT2         | 13.6              | 7.9            | 10.80                      | 13.40         | 0.895 X 3.65                     |
| 27000                         | 330273U6R3JS2          | 19.2              | 13.0           | 9.11                       | 10.40         | 1.02 X 3.15                      |
| 27000                         | 330R273U6R3JS2         | 15.1              | 8.6            | 10.30                      | 12.80         | 1.02 X 3.15                      |
| 33000                         | 330333U6R3JT2          | 16.7              | 11.4           | 10.50                      | 12.00         | 1.02 X 3.65                      |
| 33000                         | 330R333U6R3JT2         | 10.4              | 5.9            | 13.30                      | 16.60         | 1.02 X 3.65                      |
| <b>7.5 Vdc (10 Vdc Surge)</b> |                        |                   |                |                            |               |                                  |
| 12000                         | 330123U7R5GT2          | 27.2              | 15.0           | 7.01                       | 8.91          | 0.77 X 3.65                      |
| 12000                         | 330R123U7R5GT2         | 23.6              | 13.0           | 7.53                       | 9.57          | 0.77 X 3.65                      |
| 15000                         | 330153U7R5HP2          | 27.7              | 16.6           | 6.50                       | 7.91          | 0.895 X 2.65                     |
| 15000                         | 330R153U7R5HP2         | 20.0              | 11.0           | 7.65                       | 9.73          | 0.895 X 2.65                     |
| 15000                         | 330153U7R5JL2          | 30.1              | 19.9           | 6.02                       | 6.99          | 1.02 X 2.15                      |
| 15000                         | 330R153U7R5JL2         | 19.6              | 10.9           | 7.47                       | 9.41          | 1.02 X 2.15                      |
| 18000                         | 330183U7R5HS2          | 22.9              | 13.8           | 7.79                       | 9.48          | 0.895 X 3.15                     |
| 18000                         | 330R183U7R5HS2         | 16.3              | 9.0            | 9.23                       | 11.74         | 0.895 X 3.15                     |
| 22000                         | 330223U7R5HT2          | 19.8              | 11.9           | 8.95                       | 10.89         | 0.895 X 3.65                     |
| 22000                         | 330R223U7R5HT2         | 13.9              | 7.7            | 10.70                      | 13.60         | 0.895 X 3.65                     |
| 22000                         | 330223U7R5JP2          | 23.4              | 15.5           | 7.59                       | 8.80          | 1.02 X 2.65                      |
| 22000                         | 330R223U7R5JP2         | 15.0              | 8.4            | 9.47                       | 11.90         | 1.02 X 2.65                      |
| 27000                         | 330273U7R5JS2          | 19.5              | 12.9           | 9.03                       | 10.50         | 1.02 X 3.15                      |
| 27000                         | 330R273U7R5JS2         | 15.5              | 8.7            | 10.10                      | 12.80         | 1.02 X 3.15                      |

| Cap.<br>(μF)                            | Catalog<br>Part Number | ESR Max.<br>25 °C |                | Ripple Amps,<br>Max. 85 °C |               | Nominal<br>Size<br>D X L<br>(in) |
|-----------------------------------------|------------------------|-------------------|----------------|----------------------------|---------------|----------------------------------|
|                                         |                        | 120 Hz<br>(mΩ)    | 20 kHz<br>(mΩ) | 120 Hz<br>(A)              | 20 kHz<br>(A) |                                  |
| <b>7.5 Vdc (10 Vdc Surge) (cont'd.)</b> |                        |                   |                |                            |               |                                  |
| 33000                                   | 330333U7R5JT2          | 17.0              | 11.2           | 10.40                      | 12.10         | 1.02 X 3.65                      |
| 33000                                   | 330R333U7R5JT2         | 10.6              | 5.9            | 13.10                      | 16.60         | 1.02 X 3.65                      |
| <b>10 Vdc (15 Vdc Surge)</b>            |                        |                   |                |                            |               |                                  |
| 12000                                   | 330123U010GT2          | 28.3              | 15.0           | 6.88                       | 8.91          | 0.77 X 3.65                      |
| 12000                                   | 330R123U010GT2         | 24.5              | 13.0           | 7.39                       | 9.57          | 0.77 X 3.65                      |
| 12000                                   | 330123U010HP2          | 28.7              | 16.6           | 6.39                       | 7.91          | 0.895 X 2.65                     |
| 12000                                   | 330R123U010HP2         | 20.8              | 11.5           | 7.49                       | 9.53          | 0.895 X 2.65                     |
| 12000                                   | 330123U010JL2          | 31.0              | 19.9           | 5.93                       | 6.99          | 1.02 X 2.15                      |
| 12000                                   | 330R123U010JL2         | 20.3              | 11.4           | 7.33                       | 9.23          | 1.02 X 2.15                      |
| 15000                                   | 330153U010HS2          | 23.7              | 13.7           | 7.66                       | 9.49          | 0.895 X 3.15                     |
| 15000                                   | 330R153U010HS2         | 17.0              | 9.3            | 9.05                       | 11.50         | 0.895 X 3.15                     |
| 18000                                   | 330183U010HT2          | 20.5              | 11.9           | 8.81                       | 10.90         | 0.895 X 3.65                     |
| 18000                                   | 330R183U010HT2         | 14.5              | 8.0            | 10.50                      | 13.30         | 0.895 X 3.65                     |
| 18000                                   | 330183U010JP2          | 24.1              | 15.4           | 7.48                       | 8.81          | 1.02 X 2.65                      |
| 18000                                   | 330R183U010JP2         | 15.6              | 8.7            | 9.29                       | 11.70         | 1.02 X 2.65                      |
| 22000                                   | 330223U010JS2          | 20.1              | 12.8           | 8.90                       | 10.50         | 1.02 X 3.15                      |
| 22000                                   | 330R223U010JS2         | 16.1              | 9.0            | 9.94                       | 12.50         | 1.02 X 3.15                      |
| 27000                                   | 330273U010JT2          | 17.5              | 11.2           | 10.30                      | 12.10         | 1.02 X 3.65                      |
| 27000                                   | 330R273U010JT2         | 11.0              | 6.2            | 12.90                      | 16.30         | 1.02 X 3.65                      |
| <b>16 Vdc (25 Vdc Surge)</b>            |                        |                   |                |                            |               |                                  |
| 10000                                   | 330103U016GT2          | 29.2              | 14.9           | 6.77                       | 8.94          | 0.77 X 3.65                      |
| 10000                                   | 330R103U016GT2         | 25.3              | 12.9           | 7.27                       | 9.60          | 0.77 X 3.65                      |
| 10000                                   | 330103U016HP2          | 29.5              | 17.1           | 6.30                       | 7.79          | 0.895 X 2.65                     |
| 10000                                   | 330R103U016HP2         | 21.6              | 11.9           | 7.36                       | 9.36          | 0.895 X 2.65                     |
| 10000                                   | 330103U016JL2          | 31.8              | 19.7           | 5.86                       | 7.01          | 1.02 X 2.15                      |
| 10000                                   | 330R103U016JL2         | 21.0              | 11.1           | 7.21                       | 9.33          | 1.02 X 2.15                      |
| 12000                                   | 330123U016HS2          | 24.4              | 14.1           | 7.55                       | 9.35          | 0.895 X 3.15                     |
| 12000                                   | 330R123U016HS2         | 17.6              | 9.7            | 8.89                       | 11.30         | 0.895 X 3.15                     |
| 15000                                   | 330153U016HT2          | 21.1              | 12.2           | 8.69                       | 10.80         | 0.895 X 3.65                     |
| 15000                                   | 330R153U016HT2         | 15.0              | 8.2            | 10.30                      | 13.10         | 0.895 X 3.65                     |
| 15000                                   | 330153U016JP2          | 24.7              | 15.3           | 7.39                       | 8.85          | 1.02 X 2.65                      |

# Type 330 –55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

| Cap.<br>(µF)                    | Catalog<br>Part Number | ESR Max.<br>25 °C |                | Ripple Amps,<br>Max. 85 °C |               | Nominal<br>Size<br>D X L<br>(in) |
|---------------------------------|------------------------|-------------------|----------------|----------------------------|---------------|----------------------------------|
|                                 |                        | 120 Hz<br>(mΩ)    | 20 kHz<br>(mΩ) | 120 Hz<br>(A)              | 20 kHz<br>(A) |                                  |
| 16 Vdc (25 Vdc Surge) (cont'd.) |                        |                   |                |                            |               |                                  |
| 15000                           | 330R153U016JP2         | 16.1              | 8.5            | 9.14                       | 11.80         | 1.02 X 2.65                      |
| 18000                           | 330183U016JS2          | 20.5              | 12.7           | 8.80                       | 10.50         | 1.02 X 3.15                      |
| 18000                           | 330R183U016JS2         | 16.6              | 8.8            | 9.79                       | 12.70         | 1.02 X 3.15                      |
| 22000                           | 330223U016JT2          | 17.9              | 11.1           | 10.10                      | 12.10         | 1.02 X 3.65                      |
| 22000                           | 330R223U016JT2         | 11.4              | 6.0            | 12.70                      | 16.50         | 1.02 X 3.65                      |
| 20 Vdc (30 Vdc Surge)           |                        |                   |                |                            |               |                                  |
| 8200                            | 330822U020GT2          | 29.2              | 14.9           | 6.77                       | 8.94          | 0.77 X 3.65                      |
| 8200                            | 330R822U020GT2         | 25.3              | 12.9           | 7.27                       | 9.60          | 0.77 X 3.65                      |
| 8200                            | 330822U020HP2          | 29.5              | 16.5           | 6.30                       | 7.93          | 0.895 X 2.65                     |
| 8200                            | 330R822U020HP2         | 21.6              | 12.1           | 7.36                       | 9.28          | 0.895 X 2.65                     |
| 8200                            | 330822U020JL2          | 31.8              | 20.1           | 5.86                       | 6.96          | 1.02 X 2.15                      |
| 8200                            | 330R822U020JL2         | 21.0              | 11.1           | 7.21                       | 9.33          | 1.02 X 2.15                      |
| 10000                           | 330103U020HS2          | 24.4              | 13.7           | 7.55                       | 9.52          | 0.895 X 3.15                     |
| 10000                           | 330R103U020HS2         | 17.6              | 9.8            | 8.89                       | 11.20         | 0.895 X 3.15                     |
| 12000                           | 330123U020HT2          | 21.1              | 11.8           | 8.69                       | 10.90         | 0.895 X 3.65                     |
| 12000                           | 330R123U020HT2         | 15.0              | 8.4            | 10.30                      | 13.00         | 0.895 X 3.65                     |
| 12000                           | 330123U020JP2          | 24.7              | 15.6           | 7.39                       | 8.77          | 1.02 X 2.65                      |
| 12000                           | 330R123U020JP2         | 16.1              | 8.5            | 9.14                       | 11.80         | 1.02 X 2.65                      |
| 15000                           | 330153U020JS2          | 20.5              | 12.9           | 8.80                       | 10.50         | 1.02 X 3.15                      |
| 15000                           | 330R153U020JS2         | 13.2              | 7.0            | 11.00                      | 14.20         | 1.02 X 3.15                      |
| 18000                           | 330183U020JT2          | 17.9              | 11.2           | 10.10                      | 12.00         | 1.02 X 3.65                      |
| 18000                           | 330R183U020JT2         | 11.4              | 6.0            | 12.70                      | 16.50         | 1.02 X 3.65                      |
| 25 Vdc (35 Vdc Surge)           |                        |                   |                |                            |               |                                  |
| 6800                            | 330682U025GT2          | 31.2              | 15.0           | 6.55                       | 8.91          | 0.77 X 3.65                      |
| 6800                            | 330R682U025GT2         | 27.0              | 13.0           | 7.04                       | 9.58          | 0.77 X 3.65                      |
| 6800                            | 330682U025HP2          | 31.3              | 16.6           | 6.11                       | 7.91          | 0.895 X 2.65                     |
| 6800                            | 330R682U025HP2         | 23.1              | 10.9           | 7.11                       | 9.77          | 0.895 X 2.65                     |
| 6800                            | 330682U025JL2          | 33.5              | 20.1           | 5.71                       | 6.94          | 1.02 X 2.15                      |
| 6800                            | 330R682U025JL2         | 22.5              | 11.3           | 6.96                       | 9.29          | 1.02 X 2.15                      |
| 8200                            | 330822U025HS2          | 25.8              | 13.7           | 7.34                       | 9.50          | 0.895 X 3.15                     |
| 8200                            | 330R822U025HS2         | 18.9              | 8.9            | 8.59                       | 11.80         | 0.895 X 3.15                     |
| 10000                           | 330103U025HT2          | 22.3              | 11.8           | 8.45                       | 10.90         | 0.895 X 3.65                     |
| 10000                           | 330R103U025HT2         | 16.0              | 7.5            | 9.96                       | 13.70         | 0.895 X 3.65                     |
| 10000                           | 330103U025JP2          | 26.0              | 15.6           | 7.20                       | 8.77          | 1.02 X 2.65                      |
| 10000                           | 330R103U025JP2         | 17.2              | 8.6            | 8.84                       | 11.80         | 1.02 X 2.65                      |
| 12000                           | 330123U025JS2          | 21.6              | 12.9           | 8.59                       | 10.50         | 1.02 X 3.15                      |
| 12000                           | 330R123U025JS2         | 14.1              | 7.1            | 10.60                      | 14.10         | 1.02 X 3.15                      |
| 15000                           | 330153U025JT2          | 18.7              | 11.2           | 9.90                       | 12.10         | 1.02 X 3.65                      |
| 15000                           | 330R153U025JT2         | 12.1              | 6.0            | 12.30                      | 16.40         | 1.02 X 3.65                      |
| 40 Vdc (60 Vdc Surge)           |                        |                   |                |                            |               |                                  |
| 4700                            | 330472U040GT2          | 36.4              | 16.4           | 6.06                       | 8.52          | 0.77 X 3.65                      |
| 4700                            | 330R472U040GT2         | 31.6              | 14.2           | 6.51                       | 9.15          | 0.77 X 3.65                      |
| 4700                            | 330472U040HP2          | 36.2              | 17.4           | 5.68                       | 7.73          | 0.895 X 2.65                     |
| 4700                            | 330R472U040HP2         | 27.4              | 12.0           | 6.54                       | 9.29          | 0.895 X 2.65                     |
| 4700                            | 330472U040JL2          | 38.1              | 20.9           | 5.35                       | 6.81          | 1.02 X 2.15                      |
| 4700                            | 330R472U040JL2         | 26.5              | 12.2           | 6.42                       | 8.93          | 1.02 X 2.15                      |
| 40 Vdc (60 Vdc Surge) (cont'd.) |                        |                   |                |                            |               |                                  |
| 5600                            | 330562U040HS2          | 29.7              | 14.3           | 6.84                       | 9.31          | 0.895 X 3.15                     |
| 5600                            | 330R562U040HS2         | 22.2              | 9.8            | 7.91                       | 11.20         | 0.895 X 3.15                     |
| 6800                            | 330682U040HT2          | 25.5              | 12.3           | 7.89                       | 10.70         | 0.895 X 3.65                     |
| 6800                            | 330R682U040HT2         | 18.9              | 8.3            | 9.18                       | 13.10         | 0.895 X 3.65                     |
| 6800                            | 330682U040JP2          | 29.4              | 16.2           | 6.77                       | 8.61          | 1.02 X 2.65                      |
| 6800                            | 330R682U040JP2         | 20.2              | 9.3            | 8.17                       | 11.40         | 1.02 X 2.65                      |
| 8200                            | 330822U040JS2          | 24.3              | 13.4           | 8.09                       | 10.30         | 1.02 X 3.15                      |
| 8200                            | 330R822U040JS2         | 16.5              | 7.6            | 9.82                       | 13.60         | 1.02 X 3.15                      |
| 10000                           | 330103U040JT2          | 21.0              | 11.5           | 9.35                       | 11.90         | 1.02 X 3.65                      |
| 10000                           | 330R103U040JT2         | 14.1              | 6.5            | 11.40                      | 15.90         | 1.02 X 3.65                      |
| 50 Vdc (75 Vdc Surge)           |                        |                   |                |                            |               |                                  |
| 3300                            | 330332U050GT2          | 44.3              | 16.4           | 5.49                       | 8.52          | 0.77 X 3.65                      |
| 3300                            | 330R332U050GT2         | 38.4              | 14.2           | 5.90                       | 9.15          | 0.77 X 3.65                      |
| 3300                            | 330332U050HP2          | 43.5              | 17.8           | 5.18                       | 7.63          | 0.895 X 2.65                     |
| 3300                            | 330R332U050HP2         | 33.7              | 12.1           | 5.89                       | 9.26          | 0.895 X 2.65                     |
| 3900                            | 330392U050JL2          | 44.9              | 21.6           | 4.93                       | 6.71          | 1.02 X 2.15                      |
| 3900                            | 330R392U050JL2         | 32.4              | 12.6           | 5.81                       | 8.77          | 1.02 X 2.15                      |
| 4700                            | 330472U050HS2          | 35.6              | 14.6           | 6.25                       | 9.21          | 0.895 X 3.15                     |
| 4700                            | 330R472U050HS2         | 27.3              | 9.8            | 7.14                       | 11.20         | 0.895 X 3.15                     |
| 5600                            | 330562U050HT2          | 30.4              | 12.5           | 7.23                       | 10.60         | 0.895 X 3.65                     |
| 5600                            | 330R562U050HT2         | 23.1              | 8.3            | 8.30                       | 13.00         | 0.895 X 3.65                     |
| 5600                            | 330562U050JP2          | 34.5              | 16.6           | 6.25                       | 8.50          | 1.02 X 2.65                      |
| 5600                            | 330R562U050JP2         | 24.6              | 9.6            | 7.40                       | 11.20         | 1.02 X 2.65                      |
| 6800                            | 330682U050JS2          | 28.4              | 13.6           | 7.48                       | 10.20         | 1.02 X 3.15                      |
| 6800                            | 330R682U050JS2         | 20.0              | 7.8            | 8.91                       | 13.40         | 1.02 X 3.15                      |
| 8200                            | 330822U050JT2          | 24.4              | 11.7           | 8.67                       | 11.80         | 1.02 X 3.65                      |
| 8200                            | 330R822U050JT2         | 17.0              | 6.6            | 10.40                      | 15.70         | 1.02 X 3.65                      |
| 63 Vdc (90 Vdc Surge)           |                        |                   |                |                            |               |                                  |
| 2200                            | 330222U063GT2          | 49.6              | 16.4           | 5.19                       | 8.53          | 0.77 X 3.65                      |
| 2200                            | 330R222U063GT2         | 43.0              | 14.2           | 5.58                       | 9.16          | 0.77 X 3.65                      |
| 2700                            | 330272U063HP2          | 48.4              | 18.4           | 4.92                       | 7.52          | 0.895 X 2.65                     |
| 2700                            | 330R272U063HP2         | 37.9              | 12.5           | 5.55                       | 9.11          | 0.895 X 2.65                     |
| 2700                            | 330272U063JL2          | 49.5              | 21.8           | 4.70                       | 6.68          | 1.02 X 2.15                      |
| 2700                            | 330R272U063JL2         | 36.3              | 12.7           | 5.48                       | 8.74          | 1.02 X 2.15                      |
| 3300                            | 330332U063HS2          | 39.5              | 15.0           | 5.94                       | 9.08          | 0.895 X 3.15                     |
| 3300                            | 330R332U063HS2         | 30.7              | 10.1           | 6.73                       | 11.10         | 0.895 X 3.15                     |
| 3900                            | 330392U063HT2          | 33.7              | 12.8           | 6.87                       | 10.50         | 0.895 X 3.65                     |
| 3900                            | 330R392U063HT2         | 25.9              | 8.5            | 7.84                       | 12.90         | 0.895 X 3.65                     |
| 3900                            | 330392U063JP2          | 37.9              | 16.7           | 5.96                       | 8.47          | 1.02 X 2.65                      |
| 3900                            | 330R392U063JP2         | 27.6              | 9.7            | 6.99                       | 11.10         | 1.02 X 2.65                      |
| 4700                            | 330472U063JS2          | 31.1              | 13.7           | 7.15                       | 10.20         | 1.02 X 3.15                      |
| 4700                            | 330R472U063JS2         | 22.4              | 7.8            | 8.42                       | 13.40         | 1.02 X 3.15                      |
| 5600                            | 330562U063JT2          | 26.7              | 11.7           | 8.30                       | 11.80         | 1.02 X 3.65                      |
| 5600                            | 330R562U063JT2         | 19.0              | 6.6            | 9.83                       | 15.70         | 1.02 X 3.65                      |
| 75 Vdc (100 Vdc Surge)          |                        |                   |                |                            |               |                                  |
| 1800                            | 330182U075GT2          | 62.7              | 27.0           | 4.62                       | 6.64          | 0.77 X 3.65                      |

# Type 330 –55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

| Cap.<br>(μF)                     | Catalog<br>Part Number | ESR Max.<br>25 °C |                | Ripple Amps,<br>Max. 85 °C |               | Nominal<br>Size<br>D X L<br>(in) |
|----------------------------------|------------------------|-------------------|----------------|----------------------------|---------------|----------------------------------|
|                                  |                        | 120 Hz<br>(mΩ)    | 20 kHz<br>(mΩ) | 120 Hz<br>(A)              | 20 kHz<br>(A) |                                  |
| 75 Vdc (100 Vdc Surge) (cont'd.) |                        |                   |                |                            |               |                                  |
| 1800                             | 330R182U075GT2         | 54.3              | 23.4           | 4.96                       | 7.13          | 0.77 X 3.65                      |
| 2200                             | 330222U075HP2          | 60.6              | 27.9           | 4.39                       | 6.11          | 0.895 X 2.65                     |
| 2200                             | 330R222U075HP2         | 48.5              | 20.9           | 4.91                       | 7.06          | 0.895 X 2.65                     |
| 2200                             | 330222U075JL2          | 60.8              | 30.4           | 4.24                       | 5.65          | 1.02 X 2.15                      |
| 2200                             | 330R222U075JL2         | 46.2              | 20.3           | 4.86                       | 6.91          | 1.02 X 2.15                      |
| 2700                             | 330272U075HS2          | 49.2              | 22.6           | 5.32                       | 7.39          | 0.895 X 3.15                     |
| 2700                             | 330R272U075HS2         | 39.1              | 16.8           | 5.96                       | 8.57          | 0.895 X 3.15                     |
| 2700                             | 330272U075HT2          | 41.8              | 19.2           | 6.17                       | 8.58          | 0.895 X 3.65                     |
| 2700                             | 330R272U075HT2         | 32.9              | 14.2           | 6.95                       | 9.99          | 0.895 X 3.65                     |
| 2700                             | 330272U075JP2          | 46.4              | 23.2           | 5.39                       | 7.18          | 1.02 X 2.65                      |
| 2700                             | 330R272U075JP2         | 35.0              | 15.4           | 6.21                       | 8.82          | 1.02 X 2.65                      |
| 3300                             | 330332U075JS2          | 37.9              | 19.0           | 6.47                       | 8.63          | 1.02 X 3.15                      |
| 3300                             | 330R332U075JS2         | 28.3              | 12.5           | 7.49                       | 10.60         | 1.02 X 3.15                      |
| 3900                             | 330392U075JT2          | 32.4              | 16.2           | 7.53                       | 10.00         | 1.02 X 3.65                      |
| 3900                             | 330R392U075JT2         | 23.9              | 10.5           | 8.76                       | 12.40         | 1.02 X 3.65                      |
| 100 Vdc (140 Vdc Surge)          |                        |                   |                |                            |               |                                  |
| 820                              | 330821U100GT2          | 99.5              | 37.8           | 3.67                       | 5.61          | 0.77 X 3.65                      |
| 820                              | 330R821U100GT2         | 86.2              | 32.8           | 3.94                       | 6.02          | 0.77 X 3.65                      |
| 1000                             | 330102U100HP2          | 94.7              | 36.0           | 3.51                       | 5.38          | 0.895 X 2.65                     |
| 1000                             | 330R102U100HP2         | 78.1              | 29.7           | 3.87                       | 5.92          | 0.895 X 2.65                     |
| 1000                             | 330102U100JL2          | 92.7              | 37.1           | 3.43                       | 5.12          | 1.02 X 2.15                      |
| 1000                             | 330R102U100JL2         | 73.8              | 28.8           | 3.85                       | 5.81          | 1.02 X 2.15                      |
| 1200                             | 330122U100HS2          | 76.5              | 29.1           | 4.26                       | 6.52          | 0.895 X 3.15                     |
| 1200                             | 330R122U100HS2         | 62.8              | 23.9           | 4.71                       | 7.20          | 0.895 X 3.15                     |
| 1200                             | 330122U100HT2          | 64.5              | 24.5           | 4.96                       | 7.59          | 0.895 X 3.65                     |
| 1200                             | 330R122U100HT2         | 52.6              | 20.0           | 5.50                       | 8.41          | 0.895 X 3.65                     |
| 1200                             | 330122U100JP2          | 70.3              | 28.1           | 4.38                       | 6.53          | 1.02 X 2.65                      |
| 1200                             | 330R122U100JP2         | 55.7              | 21.7           | 4.92                       | 7.43          | 1.02 X 2.65                      |
| 1500                             | 330152U100JS2          | 57.0              | 22.8           | 5.28                       | 7.87          | 1.02 X 3.15                      |
| 1500                             | 330R152U100JS2         | 44.9              | 17.5           | 5.95                       | 8.99          | 1.02 X 3.15                      |

| Cap.<br>(μF)                      | Catalog<br>Part Number | ESR Max.<br>25 °C |                | Ripple Amps,<br>Max. 85 °C |               | Nominal<br>Size |
|-----------------------------------|------------------------|-------------------|----------------|----------------------------|---------------|-----------------|
|                                   |                        | 120 Hz<br>(mΩ)    | 20 kHz<br>(mΩ) | 120 Hz<br>(A)              | 20 kHz<br>(A) |                 |
| 100 Vdc (140 Vdc Surge) (cont'd.) |                        |                   |                |                            |               |                 |
| 2200                              | 330222U100JT2          | 48.3              | 19.3           | 6.17                       | 9.19          | 1.02 X 3.65     |
| 2200                              | 330R222U100JT2         | 37.7              | 14.7           | 6.97                       | 10.50         | 1.02 X 3.65     |
| 160 Vdc (200 Vdc Surge)           |                        |                   |                |                            |               |                 |
| 330                               | 330331T160GT2          | 306               | 116            | 2.09                       | 3.20          | 0.77 X 3.65     |
| 390                               | 330391T160HP2          | 268               | 102            | 2.09                       | 3.19          | 0.895 X 2.65    |
| 390                               | 330391T160JL2          | 278               | 111            | 1.98                       | 2.95          | 1.02 X 2.15     |
| 470                               | 330471T160HS2          | 226               | 85.7           | 2.48                       | 3.80          | 0.895 X 3.15    |
| 470                               | 330471T160JP2          | 228               | 91.4           | 2.43                       | 3.62          | 1.02 X 2.65     |
| 560                               | 330561T160HT2          | 189               | 71.8           | 2.90                       | 4.44          | 0.895 X 3.65    |
| 560                               | 330561T160JS2          | 184               | 73.5           | 2.94                       | 4.39          | 1.02 X 3.15     |
| 680                               | 330681T160JT2          | 154               | 61.6           | 3.45                       | 5.15          | 1.02 X 3.65     |
| 200 Vdc (250 Vdc Surge)           |                        |                   |                |                            |               |                 |
| 330                               | 330331T200GT2          | 384               | 177            | 1.87                       | 2.59          | 0.77 X 3.65     |
| 330                               | 330331T200HP2          | 358               | 165            | 1.81                       | 2.51          | 0.895 X 2.65    |
| 390                               | 330391T200HS2          | 288               | 132            | 2.20                       | 3.06          | 0.895 X 3.15    |
| 390                               | 330391T200JL2          | 339               | 156            | 1.79                       | 2.49          | 1.02 X 2.15     |
| 470                               | 330471T200HT2          | 240               | 111            | 2.57                       | 3.57          | 0.895 X 3.65    |
| 470                               | 330471T200JP2          | 255               | 117            | 2.30                       | 3.19          | 1.02 X 2.65     |
| 560                               | 330561T200JS2          | 205               | 94.4           | 2.78                       | 3.87          | 1.02 X 3.15     |
| 680                               | 330681T200JT2          | 172               | 79.1           | 3.27                       | 4.54          | 1.02 X 3.65     |
| 250 Vdc (300 Vdc Surge)           |                        |                   |                |                            |               |                 |
| 270                               | 330271T250GT2          | 455               | 191            | 1.72                       | 2.50          | 0.77 X 3.65     |
| 270                               | 330271T250HP2          | 423               | 178            | 1.66                       | 2.42          | 0.895 X 2.65    |
| 270                               | 330271T250JL2          | 400               | 168            | 1.65                       | 2.40          | 1.02 X 2.15     |
| 330                               | 330331T250HS2          | 340               | 143            | 2.02                       | 2.94          | 0.895 X 3.15    |
| 390                               | 330391T250HT2          | 284               | 119            | 2.37                       | 3.44          | 0.895 X 3.65    |
| 390                               | 330391T250JP2          | 301               | 126            | 2.12                       | 3.08          | 1.02 X 2.65     |
| 470                               | 330471T250JS2          | 242               | 102            | 2.56                       | 3.73          | 1.02 X 3.15     |
| 560                               | 330561T250JT2          | 202               | 85.0           | 3.01                       | 4.38          | 1.02 X 3.65     |

## Type 330 –55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

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