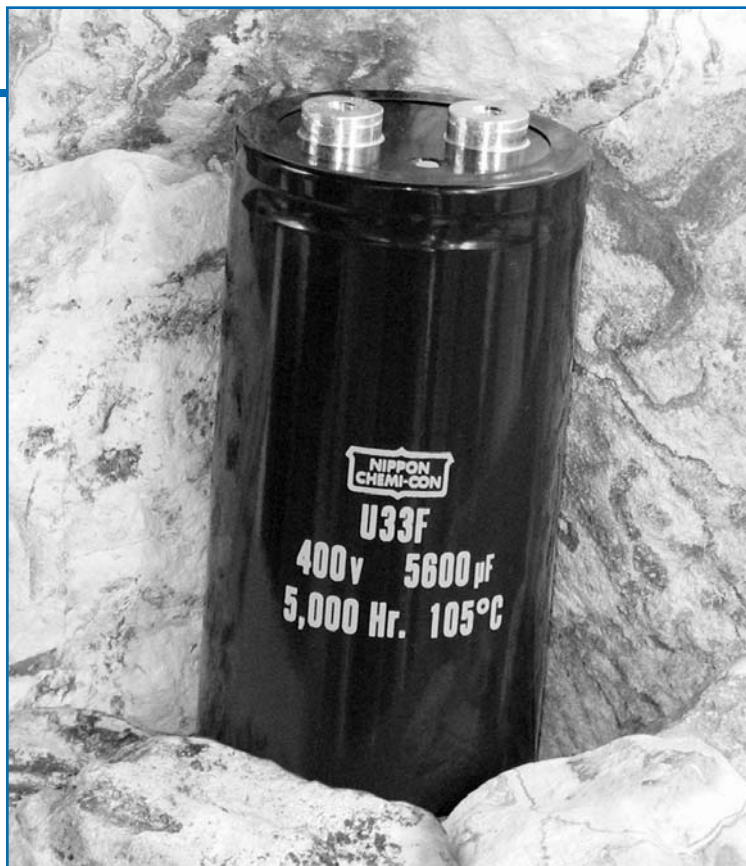


# U33F Series



- Large Can
- Screw Terminals
- High Ripple
- 350 to 500VDC Ratings
- RoHS Compliant
- +105°C Maximum Temperature
- 5,000 Hours Lifetime at +105°C
- Up to 175,000 Hours Useful Life



The U33F series is a high temperature screw mount series specifically designed to provide the ripple current capability and long life required for high reliability inverter applications. The U33F has an endurance rating of 5,000 hours at +105°C with the rated ripple current applied. The useful life can exceed 175,000 hours at +40°C and 1.5x the ripple current. These capacitors are available in a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are also available.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 1,200 to 15,000µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +105°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): D = 50.8mm (2.000") to 89mm (3.500"); L = 92mm (3.625") to 219mm (8.625").
- Rated lifetime: 5,000 hours at +105°C with rated ripple current applied.

# U33F Series

## U33F Specifications - Screw Terminals

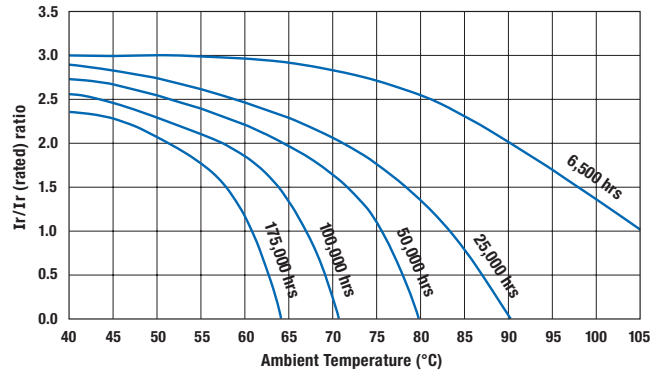
| Item                             | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|----------------------|-------------------|---------|--------------------|------------------|------|-------------|---------------|-----------|-------|----------------|------------|---------|-------|-------------------|----------------------|------|------|----------------------|------|------|-------|-------------------|----------------------|------|---|----------------------|---|---|-------|----|----|----|----|----|----|----|-------|----|----|----|----|----|----|----|
| Category Temperature Range       | − 40 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Rated Voltage Range              | 350 to 500VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Capacitance Range                | 1,200 to 15,000μF at +25°C, 120Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Capacitance Tolerance            | ± 20% (M) at +25°C, 120Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Leakage Current                  | I = 0.02CV (μA) or 5mA, whichever is smaller, after 5 minutes at +25°C.<br>Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Rated Ripple Current Multipliers | Ambient Temperature (°C) <table><tr><td>+65°C</td><td>+85°C</td><td>+105°C</td></tr><tr><td>2.20</td><td>1.73</td><td>1.00</td></tr></table><br>Frequency (Hz) <table><tr><td>DC Rated Voltage</td><td>50Hz</td><td>120Hz</td><td>300Hz</td><td>1kHz</td><td>10kHz</td><td>100kHz</td></tr><tr><td>350 - 450V</td><td>0.77</td><td>1.00</td><td>1.16</td><td>1.30</td><td>1.41</td><td>1.43</td></tr><tr><td>500V</td><td>0.70</td><td>1.00</td><td>1.16</td><td>1.30</td><td>1.41</td><td>1.43</td></tr></table><br>To determine maximum ripple current at a specified temperature and frequency, use the appropriate multiplier shown. | +65°C              | +85°C            | +105°C               | 2.20              | 1.73    | 1.00               | DC Rated Voltage | 50Hz | 120Hz       | 300Hz         | 1kHz      | 10kHz | 100kHz         | 350 - 450V | 0.77    | 1.00  | 1.16              | 1.30                 | 1.41 | 1.43 | 500V                 | 0.70 | 1.00 | 1.16  | 1.30              | 1.41                 | 1.43 |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| +65°C                            | +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | +105°C             |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| 2.20                             | 1.73                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.00               |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| DC Rated Voltage                 | 50Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 120Hz              | 300Hz            | 1kHz                 | 10kHz             | 100kHz  |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| 350 - 450V                       | 0.77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.00               | 1.16             | 1.30                 | 1.41              | 1.43    |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| 500V                             | 0.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.00               | 1.16             | 1.30                 | 1.41              | 1.43    |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Endurance (Load Life)            | The following specifications shall be satisfied when the capacitors are restored to +25°C after subjecting them to DC voltage for 5,000 hours at +105°C with the rated ripple current applied. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors.<br><br>Capacitance change: ≤ 20% from initial measurement<br>ESR change : ≤ 200% of initial specified limit<br>Leakage current : ≤ initial specified limit                                                                                                                                                                        |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Useful Life                      | With specified standard voltage and ripple current applied, typical life as function of ambient temperature is listed below. <table><tr><td>+105°C</td><td>6,500 hours max.</td></tr><tr><td>+85°C</td><td>24,000 hours max.</td></tr><tr><td>+65°C</td><td>122,000 hours max.</td></tr></table><br>Capacitance change: ≤ 30% from initial measurement<br>ESR change : ≤ 300% of initial specified limit<br>Leakage current : ≤ initial specified limit                                                                                                                                                                                  | +105°C             | 6,500 hours max. | +85°C                | 24,000 hours max. | +65°C   | 122,000 hours max. |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| +105°C                           | 6,500 hours max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| +85°C                            | 24,000 hours max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| +65°C                            | 122,000 hours max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Shelf Life                       | The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 hours at +105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.<br><br>Capacitance change: ≤ 20% from initial measurement<br>ESR change : ≤ 200% of initial specified limit<br>Leakage current : ≤ initial specified limit                                                                                                                                                        |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Vibration Rating                 | 10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Maximum Tightening Torque        | <table><tr><td>Terminal Code</td><td>HP</td><td>HL</td><td>CD</td><td>CP</td><td>CH</td><td>CA</td><td>CS</td></tr><tr><td>Thread Size</td><td>10 - 32 NF-2B</td><td>M5x0.8-6H</td><td></td><td>1/4 - 28 NF-2B</td><td></td><td>M6x1-6H</td><td></td></tr><tr><td>3 Threads Engaged</td><td colspan="3">2.0 N·m (18.0 in·lb)</td><td colspan="4">4.0 N·m (35.0 in·lb)</td></tr><tr><td>6 Threads Engaged</td><td colspan="3">2.8 N·m (25.0 in·lb)</td><td colspan="4">6.2 N·m (55.0 in·lb)</td></tr></table>                                                                                                                             | Terminal Code      | HP               | HL                   | CD                | CP      | CH                 | CA               | CS   | Thread Size | 10 - 32 NF-2B | M5x0.8-6H |       | 1/4 - 28 NF-2B |            | M6x1-6H |       | 3 Threads Engaged | 2.0 N·m (18.0 in·lb) |      |      | 4.0 N·m (35.0 in·lb) |      |      |       | 6 Threads Engaged | 2.8 N·m (25.0 in·lb) |      |   | 6.2 N·m (55.0 in·lb) |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Terminal Code                    | HP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | HL                 | CD               | CP                   | CH                | CA      | CS                 |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Thread Size                      | 10 - 32 NF-2B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | M5x0.8-6H          |                  | 1/4 - 28 NF-2B       |                   | M6x1-6H |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| 3 Threads Engaged                | 2.0 N·m (18.0 in·lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                  | 4.0 N·m (35.0 in·lb) |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| 6 Threads Engaged                | 2.8 N·m (25.0 in·lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                  | 6.2 N·m (55.0 in·lb) |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Typical Inductance (nH) at 1MHz  | <table><tr><td rowspan="2">Case Diameter (mm)</td><td colspan="7">Terminal Code</td></tr><tr><td>HP</td><td>HL</td><td>CD</td><td>CP</td><td>CH</td><td>CA</td><td>CS</td></tr><tr><td>ø50.8</td><td>—</td><td>—</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td></tr><tr><td>ø63.5</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>ø76.2</td><td>30</td><td>30</td><td>25</td><td>20</td><td>25</td><td>20</td><td>25</td></tr><tr><td>ø89.0</td><td>30</td><td>30</td><td>25</td><td>20</td><td>25</td><td>20</td><td>25</td></tr></table>                                           | Case Diameter (mm) | Terminal Code    |                      |                   |         |                    |                  |      | HP          | HL            | CD        | CP    | CH             | CA         | CS      | ø50.8 | —                 | —                    | NA   | NA   | NA                   | NA   | NA   | ø63.5 | —                 | —                    | —    | — | —                    | — | — | ø76.2 | 30 | 30 | 25 | 20 | 25 | 20 | 25 | ø89.0 | 30 | 30 | 25 | 20 | 25 | 20 | 25 |
| Case Diameter (mm)               | Terminal Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
|                                  | HP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | HL                 | CD               | CP                   | CH                | CA      | CS                 |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| ø50.8                            | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | —                  | NA               | NA                   | NA                | NA      | NA                 |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| ø63.5                            | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | —                  | —                | —                    | —                 | —       | —                  |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| ø76.2                            | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30                 | 25               | 20                   | 25                | 20      | 25                 |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| ø89.0                            | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30                 | 25               | 20                   | 25                | 20      | 25                 |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |
| Custom Designs                   | Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |                      |                   |         |                    |                  |      |             |               |           |       |                |            |         |       |                   |                      |      |      |                      |      |      |       |                   |                      |      |   |                      |   |   |       |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |

# U33F Series

## U33F Useful Life

### Useful Life: 6,500 Hours at +105°C

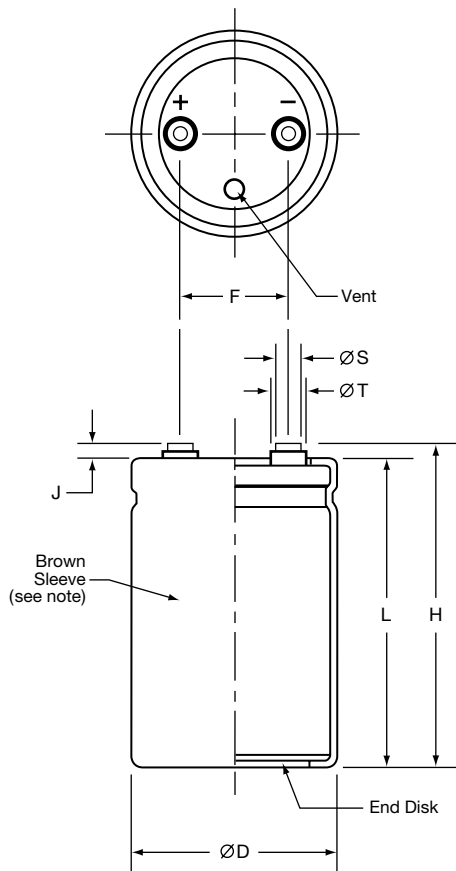
The life expectancy of a capacitor is shown as a function of ambient temperature and ripple current load.



## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

| Case Size Code                                | ØD<br>+2.0 (0.080) | L<br>±1.0 (0.040)                                                                                    | F<br>±0.25 (0.010) | Standard Box Quantity |
|-----------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------|--------------------|-----------------------|
| CB7<br>CD0                                    | 50.8 (2.000)       | 117 (4.625)<br>130 (5.125)                                                                           | 22.2 (0.875)       | 49                    |
| D92<br>DA5<br>DB7<br>DD0<br>DE3               | 63.5 (2.500)       | 92 (3.625)<br>105 (4.125)<br>117 (4.625)<br>130 (5.125)<br>143 (5.625)                               | 28.6 (1.125)       | 20                    |
| E92<br>EA5<br>EB7<br>EE3<br>EJ1<br>EM9        | 76.2 (3.000)       | 92 (3.625)<br>105 (4.125)<br>117 (4.625)<br>143 (5.625)<br>181 (7.125)<br>219 (8.625)                | 31.8 (1.250)       | 16<br>9               |
| F92<br>FA5<br>FB7<br>FE3<br>FF5<br>FK0<br>FM9 | 89.0 (3.500)       | 92 (3.625)<br>105 (4.125)<br>117 (4.625)<br>143 (5.625)<br>155 (6.125)<br>190 (7.500)<br>219 (8.625) | 31.8 (1.250)       | 5                     |

### Note:

In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

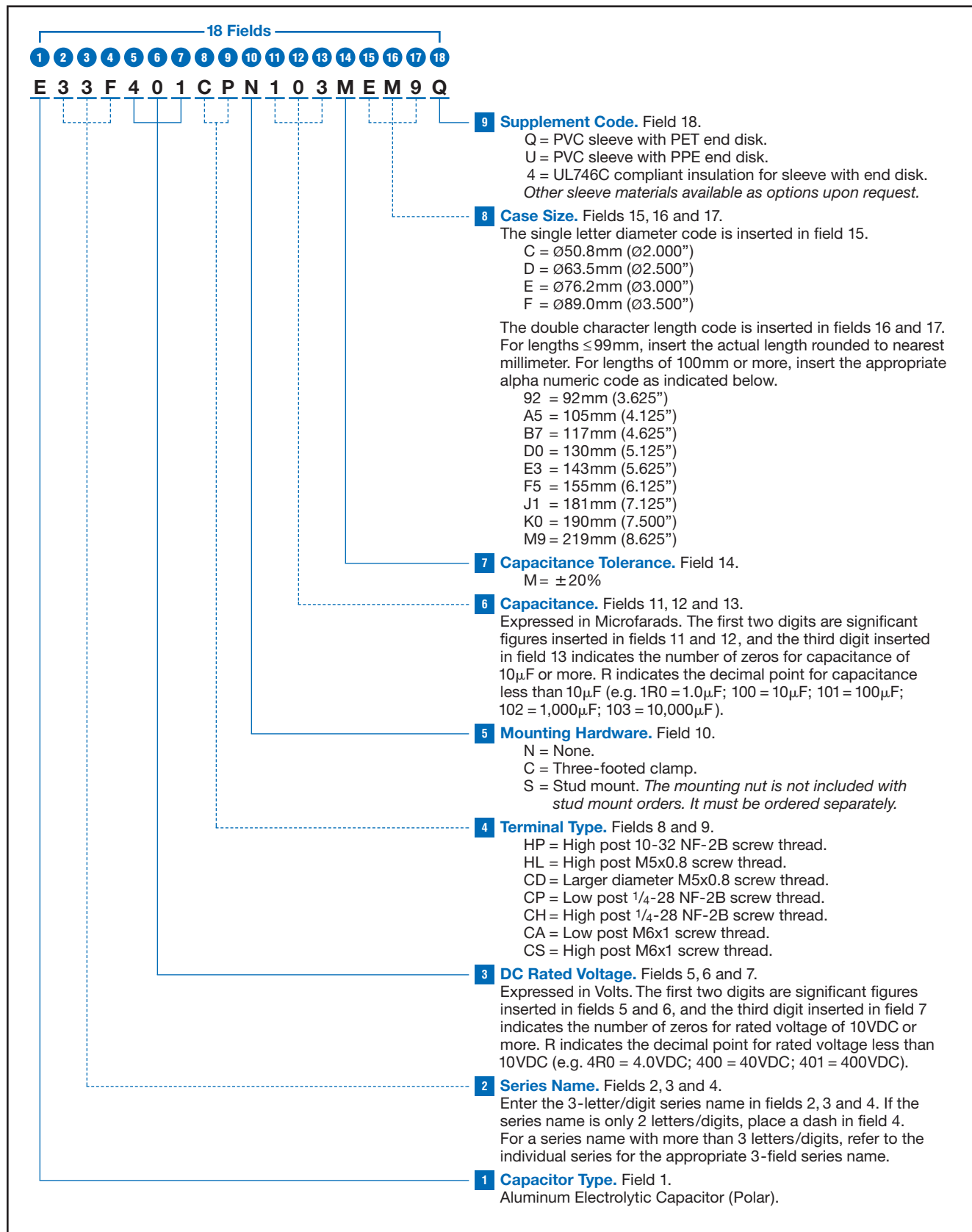
| Terminal Code | Available Case Diameter |                             | Thread Size  | Minimum Thread Depth | J<br>±0.5 (0.020) | H<br>±2.0 (0.080) | ØS<br>±0.25 (0.010) | ØT<br>±0.25 (0.010) |
|---------------|-------------------------|-----------------------------|--------------|----------------------|-------------------|-------------------|---------------------|---------------------|
|               | ØD Code                 | ØD mm (inches)              |              |                      |                   |                   |                     |                     |
| HP            | C                       | 50.8 (2.000)                | 10-32 NF-2B  | 9.5 (0.375)          | 6.4 (0.250)       | L+J               | 8.0 (0.313)         | 11.1 (0.438)        |
| HL            | C                       | 50.8 (2.000)                | M5x0.8-6H    | 9.5 (0.375)          | 6.4 (0.250)       | L+J               | 8.0 (0.313)         | 11.1 (0.438)        |
| CD            | D-E                     | 63.5 - 76.2 (2.500 - 3.000) | M5x0.8-6H    | 8.5 (0.335)          | 5.0 (0.200)       | L+J               | 13.0 (0.512)        | 18.8 (0.740)        |
| CP            | D-F                     | 63.5 - 89.0 (2.500 - 3.500) | 1/4-28 NF-2B | 8.7 (0.344)          | 2.4 (0.093)       | L+J               | 17.5 (0.689)        | —                   |
| CH            | D-F                     | 63.5 - 89.0 (2.500 - 3.500) | 1/4-28 NF-2B | 11.9 (0.468)         | 6.4 (0.250)       | L+J               | 17.5 (0.689)        | —                   |
| CA            | D-F                     | 63.5 - 89.0 (2.500 - 3.500) | M6x1-6H      | 8.7 (0.344)          | 2.4 (0.093)       | L+J               | 17.5 (0.689)        | —                   |
| CS            | D-F                     | 63.5 - 89.0 (2.500 - 3.500) | M6x1-6H      | 11.9 (0.468)         | 6.4 (0.250)       | L+J               | 17.5 (0.689)        | —                   |

Mounting Hardware is optional. Refer to hardware specifications on the following page.



# U33F Series

**Part Numbering System for U33F Series** When ordering, always specify complete 18-field global part number.



# U33F Series

## Standard Voltage Ratings - Screw Terminals

| Rated Voltage (WVDC)                | Capacitance (µF) | Global Part Number† | Nominal Case Size* D × L (mm) | Case Size Code | Maximum ESR (mΩ) at +25°C, 120Hz | Rated Ripple Current (A rms) at +105°C |       |       |
|-------------------------------------|------------------|---------------------|-------------------------------|----------------|----------------------------------|----------------------------------------|-------|-------|
|                                     |                  |                     |                               |                |                                  | 120Hz                                  | 300Hz | >3kHz |
| <b>350 Volts</b><br>400 Volts Surge | 1,800            | E33F351HPN182MCB7Q  | 50.8 × 117                    | CB7            | 58                               | 7.5                                    | 9.0   | 10.5  |
|                                     | 2,200            | E33F351HPN222MCD0Q  | 50.8 × 130                    | CD0            | 51                               | 8.3                                    | 9.9   | 11.6  |
|                                     | 2,200            | E33F351CPN222MD92Q  | 63.5 × 92                     | D92            | 48                               | 8.5                                    | 10.2  | 11.9  |
|                                     | 2,700            | E33F351CPN272MDA5Q  | 63.5 × 105                    | DA5            | 40                               | 9.7                                    | 11.7  | 13.6  |
|                                     | 3,300            | E33F351CPN332MDB7Q  | 63.5 × 117                    | DB7            | 34                               | 10.9                                   | 13.1  | 15.3  |
|                                     | 3,900            | E33F351CPN392MDD0Q  | 63.5 × 130                    | DD0            | 30                               | 12.1                                   | 14.6  | 17.0  |
|                                     | 3,900            | E33F351CPN392MDE3Q  | 63.5 × 143                    | DE3            | 29                               | 12.8                                   | 15.4  | 17.9  |
|                                     | 3,300            | E33F351CPN332ME92Q  | 76.2 × 92                     | E92            | 34                               | 11.2                                   | 13.4  | 15.6  |
|                                     | 3,900            | E33F351CPN392MEA5Q  | 76.2 × 105                    | EA5            | 28                               | 12.8                                   | 15.3  | 17.9  |
|                                     | 5,600            | E33F351CPN562MEB7Q  | 76.2 × 117                    | EB7            | 21                               | 15.3                                   | 18.4  | 21.4  |
|                                     | 6,800            | E33F351CPN682MEE3Q  | 76.2 × 143                    | EE3            | 19                               | 17.4                                   | 20.9  | 24.4  |
|                                     | 8,200            | E33F351CPN822MEJ1Q  | 76.2 × 181                    | EJ1            | 14                               | 22.0                                   | 26.4  | 30.8  |
|                                     | 10,000           | E33F351CPN103MEM9Q  | 76.2 × 219                    | EM9            | 11                               | 26.5                                   | 31.8  | 37.1  |
|                                     | 4,700            | E33F351CPN472MF92Q  | 89 × 92                       | F92            | 25                               | 14.3                                   | 17.1  | 20.0  |
|                                     | 5,600            | E33F351CPN562MFA5Q  | 89 × 105                      | FA5            | 21                               | 16.3                                   | 19.5  | 22.8  |
|                                     | 6,800            | E33F351CPN682MFB7Q  | 89 × 117                      | FB7            | 18                               | 18.3                                   | 21.9  | 25.6  |
|                                     | 8,200            | E33F351CPN822MFE3Q  | 89 × 143                      | FE3            | 14                               | 22.2                                   | 26.6  | 31.0  |
|                                     | 10,000           | E33F351CPN103MFF5Q  | 89 × 155                      | FF5            | 13                               | 24.1                                   | 28.9  | 33.7  |
|                                     | 12,000           | E33F351CPN123MFK0Q  | 89 × 190                      | FK0            | 10                               | 29.3                                   | 35.2  | 41.1  |
|                                     | 15,000           | E33F351CPN153MFM9Q  | 89 × 219                      | FM9            | 8                                | 33.6                                   | 40.4  | 47.1  |
| <b>400 Volts</b><br>450 Volts Surge | 1,800            | E33F401HPN182MCB7Q  | 50.8 × 117                    | CB7            | 58                               | 7.5                                    | 9.0   | 10.5  |
|                                     | 2,200            | E33F401HPN222MCD0Q  | 50.8 × 130                    | CD0            | 50                               | 8.3                                    | 10.0  | 11.6  |
|                                     | 2,200            | E33F401CPN222MD92Q  | 63.5 × 92                     | D92            | 47                               | 8.5                                    | 10.2  | 12.0  |
|                                     | 2,700            | E33F401CPN272MDA5Q  | 63.5 × 105                    | DA5            | 40                               | 9.8                                    | 11.7  | 13.7  |
|                                     | 3,300            | E33F401CPN332MDB7Q  | 63.5 × 117                    | DB7            | 34                               | 11.0                                   | 13.2  | 15.4  |
|                                     | 3,900            | E33F401CPN392MDD0Q  | 63.5 × 130                    | DD0            | 30                               | 12.2                                   | 14.6  | 17.0  |
|                                     | 3,900            | E33F401CPN392MDE3Q  | 63.5 × 143                    | DE3            | 26                               | 13.4                                   | 16.0  | 18.7  |
|                                     | 3,300            | E33F401CPN332ME92Q  | 76.2 × 92                     | E92            | 34                               | 11.2                                   | 13.4  | 15.7  |
|                                     | 3,900            | E33F401CPN392MEA5Q  | 76.2 × 105                    | EA5            | 28                               | 12.8                                   | 15.4  | 17.9  |
|                                     | 4,700            | E33F401CPN472MEB7Q  | 76.2 × 117                    | EB7            | 24                               | 14.4                                   | 17.3  | 20.1  |
|                                     | 5,600            | E33F401CPN562MEE3Q  | 76.2 × 143                    | EE3            | 19                               | 17.5                                   | 21.0  | 24.5  |
|                                     | 8,200            | E33F401CPN822MEJ1Q  | 76.2 × 181                    | EJ1            | 14                               | 22.1                                   | 26.5  | 30.9  |
|                                     | 10,000           | E33F401CPN103MEM9Q  | 76.2 × 219                    | EM9            | 11                               | 26.6                                   | 31.9  | 37.2  |
|                                     | 4,700            | E33F401CPN472MF92Q  | 89 × 92                       | F92            | 25                               | 14.3                                   | 17.2  | 20.0  |
|                                     | 5,600            | E33F401CPN562MFA5Q  | 89 × 105                      | FA5            | 21                               | 16.3                                   | 19.6  | 22.9  |
|                                     | 6,800            | E33F401CPN682MFB7Q  | 89 × 117                      | FB7            | 18                               | 18.3                                   | 22.0  | 25.6  |
|                                     | 8,200            | E33F401CPN822MFE3Q  | 89 × 143                      | FE3            | 14                               | 22.2                                   | 26.7  | 31.1  |
|                                     | 10,000           | E33F401CPN103MFF5Q  | 89 × 155                      | FF5            | 12                               | 24.1                                   | 29.0  | 33.8  |
|                                     | 12,000           | E33F401CPN123MFK0Q  | 89 × 190                      | FK0            | 10                               | 29.4                                   | 35.3  | 41.2  |
|                                     | 15,000           | E33F401CPN153MFM9Q  | 89 × 219                      | FM9            | 8                                | 33.7                                   | 40.5  | 47.2  |
| <b>420 Volts</b><br>470 Volts Surge | 1,500            | E33F421HPN152MCB7Q  | 50.8 × 117                    | CB7            | 69                               | 6.9                                    | 8.2   | 9.6   |
|                                     | 1,800            | E33F421HPN182MCD0Q  | 50.8 × 130                    | CD0            | 60                               | 7.6                                    | 9.1   | 10.7  |
|                                     | 1,800            | E33F421CPN182MD92Q  | 63.5 × 92                     | D92            | 57                               | 7.8                                    | 9.4   | 10.9  |
|                                     | 2,200            | E33F421CPN222MDA5Q  | 63.5 × 105                    | DA5            | 47                               | 8.9                                    | 10.7  | 12.5  |
|                                     | 2,700            | E33F421CPN272MDB7Q  | 63.5 × 117                    | DB7            | 40                               | 10.1                                   | 12.1  | 14.1  |
|                                     | 3,300            | E33F421CPN332MDD0Q  | 63.5 × 130                    | DD0            | 35                               | 11.1                                   | 13.4  | 15.6  |
|                                     | 3,300            | E33F421CPN332MDE3Q  | 63.5 × 143                    | DE3            | 34                               | 11.8                                   | 14.1  | 16.5  |
|                                     | 2,700            | E33F421CPN272ME92Q  | 76.2 × 92                     | E92            | 40                               | 10.3                                   | 12.3  | 14.4  |
|                                     | 3,300            | E33F421CPN332MEA5Q  | 76.2 × 105                    | EA5            | 34                               | 11.7                                   | 14.1  | 16.4  |
|                                     | 3,900            | E33F421CPN392MEB7Q  | 76.2 × 117                    | EB7            | 29                               | 13.2                                   | 15.8  | 18.4  |
|                                     | 5,600            | E33F421CPN562MEE3Q  | 76.2 × 143                    | EE3            | 22                               | 16.0                                   | 19.2  | 22.4  |
|                                     | 6,800            | E33F421CPN682MEJ1Q  | 76.2 × 181                    | EJ1            | 17                               | 19.8                                   | 23.8  | 27.8  |
|                                     | 8,200            | E33F421CPN822MEM9Q  | 76.2 × 219                    | EM9            | 14                               | 23.9                                   | 28.7  | 33.5  |
|                                     | 3,900            | E33F421CPN392MF92Q  | 89 × 92                       | F92            | 30                               | 13.1                                   | 15.7  | 18.3  |
|                                     | 4,700            | E33F421CPN472MFA5Q  | 89 × 105                      | FA5            | 25                               | 15.0                                   | 17.9  | 20.9  |

†For terminal, mounting and construction options, refer to the part numbering system for descriptions and codes.

\*Refer to diagram of dimensions for detailed case size specifications.

# U33F Series

## Standard Voltage Ratings - Screw Terminals

| Rated Voltage<br>(WVDC) | Capacitance<br>( $\mu$ F) | Global<br>Part Number† | Nominal<br>Case Size*<br>D × L (mm) | Case<br>Size<br>Code | Maximum ESR<br>(m $\Omega$ ) at<br>+25°C, 120Hz | Rated Ripple Current<br>(A rms) at +105°C |       |       |
|-------------------------|---------------------------|------------------------|-------------------------------------|----------------------|-------------------------------------------------|-------------------------------------------|-------|-------|
|                         |                           |                        |                                     |                      |                                                 | 120Hz                                     | 300Hz | >3kHz |

|                                      |        |                    |          |     |    |      |      |      |
|--------------------------------------|--------|--------------------|----------|-----|----|------|------|------|
| <b>420 Volts<br/>470 Volts Surge</b> | 5,600  | E33F421CPN562MFB7Q | 89 × 117 | FB7 | 21 | 16.8 | 20.1 | 23.5 |
|                                      | 8,200  | E33F421CPN822MFE3Q | 89 × 143 | FE3 | 17 | 20.4 | 24.4 | 28.5 |
|                                      | 8,200  | E33F421CPN822MFF5Q | 89 × 155 | FF5 | 15 | 22.1 | 26.5 | 31.0 |
|                                      | 10,000 | E33F421CPN103MFK0Q | 89 × 190 | FK0 | 12 | 26.9 | 32.3 | 37.7 |
|                                      | 12,000 | E33F421CPN123MFM9Q | 89 × 219 | FM9 | 10 | 30.9 | 37.1 | 43.3 |

|                                      |        |                    |            |     |    |      |      |      |
|--------------------------------------|--------|--------------------|------------|-----|----|------|------|------|
| <b>450 Volts<br/>500 Volts Surge</b> | 1,500  | E33F451HPN152MCB7Q | 50.8 × 117 | CB7 | 69 | 6.9  | 8.2  | 9.6  |
|                                      | 1,800  | E33F451HPN182MCD0Q | 50.8 × 130 | CD0 | 60 | 7.6  | 9.1  | 10.6 |
|                                      | 1,800  | E33F451CPN182MD92Q | 63.5 × 92  | D92 | 57 | 7.8  | 9.4  | 10.9 |
|                                      | 2,200  | E33F451CPN222MDA5Q | 63.5 × 105 | DA5 | 47 | 8.9  | 10.7 | 12.5 |
|                                      | 2,700  | E33F451CPN272MDB7Q | 63.5 × 117 | DB7 | 40 | 10.0 | 12.0 | 14.1 |
|                                      | 3,300  | E33F451CPN332MDD0Q | 63.5 × 130 | DD0 | 35 | 11.1 | 13.4 | 15.6 |
|                                      | 3,300  | E33F451CPN332MDE3Q | 63.5 × 143 | DE3 | 34 | 11.8 | 14.1 | 16.5 |
|                                      | 2,700  | E33F451CPN272ME92Q | 76.2 × 92  | E92 | 40 | 10.3 | 12.3 | 14.4 |
|                                      | 3,300  | E33F451CPN332MEA5Q | 76.2 × 105 | EA5 | 34 | 11.7 | 14.1 | 16.4 |
|                                      | 3,900  | E33F451CPN392MEB7Q | 76.2 × 117 | EB7 | 29 | 13.2 | 15.8 | 18.4 |
|                                      | 4,700  | E33F451CPN472MEE3Q | 76.2 × 143 | EE3 | 22 | 16.0 | 19.2 | 22.4 |
|                                      | 6,800  | E33F451CPN682MEJ1Q | 76.2 × 181 | EJ1 | 17 | 20.2 | 24.2 | 28.3 |
|                                      | 8,200  | E33F451CPN822MEM9Q | 76.2 × 219 | EM9 | 13 | 24.3 | 29.2 | 34.1 |
|                                      | 3,900  | E33F451CPN392MF92Q | 89 × 92    | F92 | 30 | 13.1 | 15.7 | 18.3 |
|                                      | 4,700  | E33F451CPN472MFA5Q | 89 × 105   | FA5 | 25 | 14.9 | 17.9 | 20.9 |
|                                      | 5,600  | E33F451CPN562MFB7Q | 89 × 117   | FB7 | 21 | 16.8 | 20.1 | 23.5 |
|                                      | 6,800  | E33F451CPN682MFE3Q | 89 × 143   | FE3 | 17 | 20.3 | 24.4 | 28.5 |
|                                      | 8,200  | E33F451CPN822MFF5Q | 89 × 155   | FF5 | 15 | 22.1 | 26.5 | 30.9 |
|                                      | 10,000 | E33F451CPN103MFK0Q | 89 × 190   | FK0 | 12 | 26.9 | 32.3 | 37.7 |
|                                      | 12,000 | E33F451CPN123MFM9Q | 89 × 219   | FM9 | 10 | 30.9 | 37.0 | 43.2 |

|                                      |        |                    |            |     |    |      |      |      |
|--------------------------------------|--------|--------------------|------------|-----|----|------|------|------|
| <b>500 Volts<br/>550 Volts Surge</b> | 1,200  | E33F501HPN122MCB7Q | 50.8 × 117 | CB7 | 82 | 6.3  | 7.5  | 8.8  |
|                                      | 1,500  | E33F501HPN152MCD0Q | 50.8 × 130 | CD0 | 72 | 6.9  | 8.3  | 9.7  |
|                                      | 1,500  | E33F501CPN152MD92Q | 63.5 × 92  | D92 | 71 | 7.0  | 8.4  | 9.8  |
|                                      | 1,800  | E33F501CPN182MDA5Q | 63.5 × 105 | DA5 | 59 | 8.0  | 9.6  | 11.2 |
|                                      | 2,200  | E33F501CPN222MDB7Q | 63.5 × 117 | DB7 | 51 | 9.0  | 10.8 | 12.6 |
|                                      | 2,200  | E33F501CPN222MDD0Q | 63.5 × 130 | DD0 | 44 | 10.0 | 12.0 | 13.9 |
|                                      | 2,700  | E33F501CPN272MDE3Q | 63.5 × 143 | DE3 | 39 | 10.9 | 13.1 | 15.3 |
|                                      | 2,200  | E33F501CPN222ME92Q | 76.2 × 92  | E92 | 51 | 9.2  | 11.0 | 12.8 |
|                                      | 2,700  | E33F501CPN272MEA5Q | 76.2 × 105 | EA5 | 42 | 10.5 | 12.6 | 14.7 |
|                                      | 3,300  | E33F501CPN332MEB7Q | 76.2 × 117 | EB7 | 36 | 11.8 | 14.1 | 16.5 |
|                                      | 3,900  | E33F501CPN392MEE3Q | 76.2 × 143 | EE3 | 28 | 14.3 | 17.2 | 20.0 |
|                                      | 5,600  | E33F501CPN562MEJ1Q | 76.2 × 181 | EJ1 | 21 | 18.1 | 21.7 | 25.3 |
|                                      | 6,800  | E33F501CPN682MEM9Q | 76.2 × 219 | EM9 | 17 | 21.8 | 26.1 | 30.5 |
|                                      | 3,300  | E33F501CPN332MF92Q | 89 × 92    | F92 | 37 | 11.7 | 14.0 | 16.4 |
|                                      | 3,900  | E33F501CPN392MFA5Q | 89 × 105   | FA5 | 31 | 13.4 | 16.0 | 18.7 |
|                                      | 4,700  | E33F501CPN472MFB7Q | 89 × 117   | FB7 | 27 | 15.0 | 18.0 | 21.0 |
|                                      | 5,600  | E33F501CPN562MFE3Q | 89 × 143   | FE3 | 21 | 18.2 | 21.8 | 25.5 |
|                                      | 6,800  | E33F501CPN682MFF5Q | 89 × 155   | FF5 | 19 | 19.8 | 23.7 | 27.7 |
|                                      | 8,200  | E33F501CPN822MFK0Q | 89 × 190   | FK0 | 15 | 24.1 | 28.9 | 33.7 |
|                                      | 10,000 | E33F501CPN103MFM9Q | 89 × 219   | FM9 | 12 | 27.6 | 33.1 | 38.7 |

† For terminal, mounting and construction options, refer to the part numbering system for descriptions and codes.

\* Refer to diagram of dimensions for detailed case size specifications.