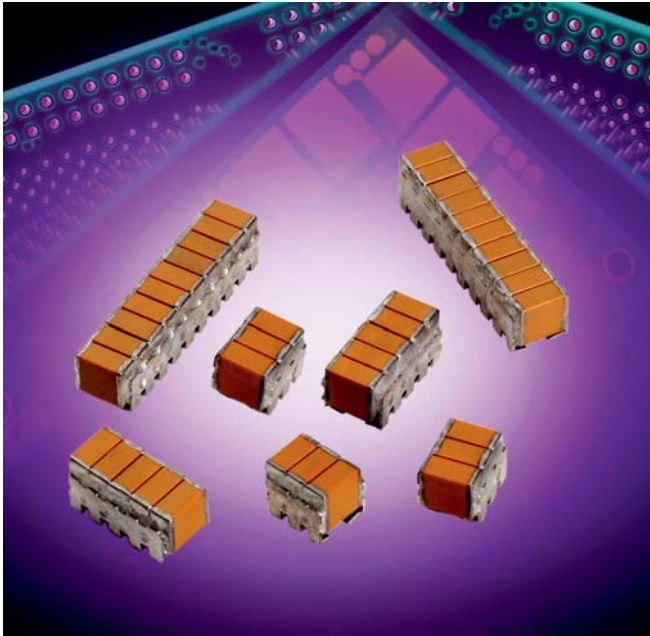


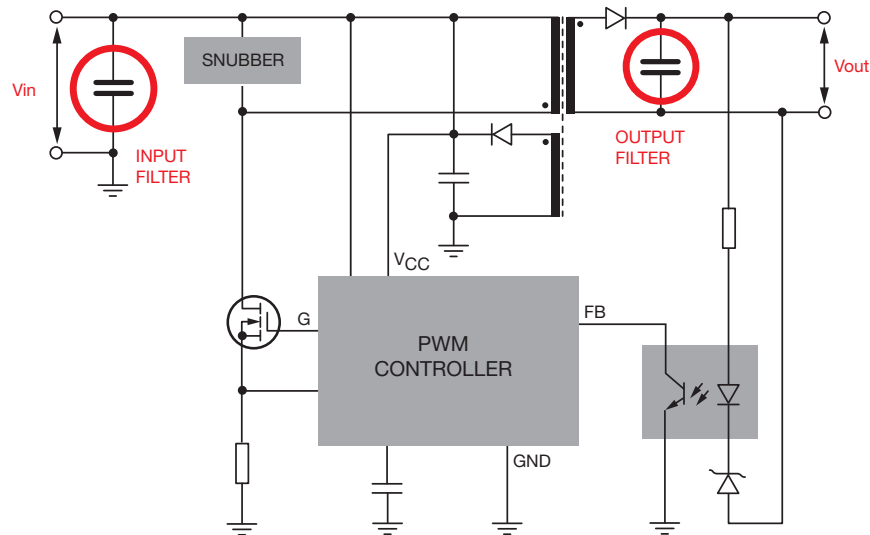
# TurboCap™

## High-CV SMPS Capacitors



The TurboCap™, MLC capacitors from AVX Corporation are characterized with very high capacitance in a small volume. By vertical stacking of the ceramic elements, the footprint required for mounting the capacitors is greatly reduced. TurboCaps™ are ideally suited as filters in the input and output stages of switch mode power supplies (SMPS). With their ultra-low ESR, these capacitors are designed to handle high ripple current at high frequencies and high power levels. The DIP leads in either thru-hole or surface mount configurations offer superior stress relief to the ceramic elements. The leads effectively decouple the parts from the board and minimize thermally or mechanically induced stresses encountered during assembly, temperature cycling or other environmental conditions.

### TYPICAL APPLICATION OF TURBOCAP™ SMPS CAPACITORS FOR INPUT AND OUTPUT FILTERS IN DC/DC CONVERTERS



Performance of SMPS Capacitors can also be simulated by downloading the newly updated SpiCalci 6.0 software program. Custom values, ratings and configurations are also available, <http://www.avx.com/SpiApps/default.asp#spicalci>.

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### ELECTRICAL SPECIFICATIONS

#### Temperature Coefficient

Temperature Coefficient ±15%, -55° to +125°C

#### Capacitance Test (MIL-STD-202 Method 305)

25°C, 1.0±0.2 Vrms (open circuit voltage) at 1KHz

#### Dissipation Factor 25°C

2.5% Max @ 25°C, 1.0±0.2 Vrms (open circuit voltage) at 1KHz

#### Insulation Resistance 25°C (MIL-STD-202 Method 302)

500 MΩ-μF, whichever is less.

#### Insulation Resistance 125°C (MIL-STD-202 Method 302)

50 MΩ-μF, whichever is less.

#### Dielectric Withstanding Voltage 25°C (Flash Test)

250% rated voltage for 5 seconds with 50 mA max charging current.

#### Life Test (1000 hrs)

X7R: 150% rated voltage at +125°C.

#### Moisture Resistance (MIL-STD-202 Method 106)

Ten cycles with no voltage applied.

#### Thermal Shock (MIL-STD-202 Method 107, Condition A)

#### Immersion Cycling (MIL-STD-202 Method 104, Condition B)

#### Resistance To Solder Heat (MIL-STD-202, Method 210, Condition B, for 20 seconds)



### Typical ESR Performance (Ω)

|              | 27μF  | 47μF   | 100μF  |
|--------------|-------|--------|--------|
| ESR @ 10KHz  | 0.007 | 0.004  | 0.003  |
| ESR @ 50KHz  | 0.003 | 0.002  | 0.0015 |
| ESR @ 100KHz | 0.002 | 0.0015 | 0.001  |

**Not RoHS Compliant**

### HOW TO ORDER

### AVX Styles: ST12 and ST20

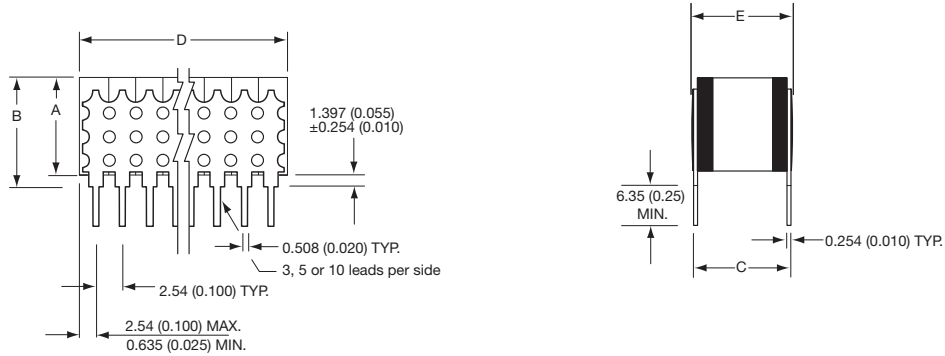
| ST12             | 5                              | C                              | 186  | M                            | A                 | N  | 03                              |
|------------------|--------------------------------|--------------------------------|--|------------------------------|-------------------|--|---------------------------------|
| <b>AVX Style</b> | <b>Voltage</b>                 | <b>Temperature Coefficient</b> | <b>Capacitance Code</b><br>(2 significant digits + no. of zeros) | <b>Capacitance Tolerance</b> | <b>Test Level</b> | <b>Termination</b>   | <b>Number of Leads Per Side</b> |
| ST12             | 25V = 3<br>50V = 5<br>100V = 1 | X7R = C                        | 1 μF = 105<br>10 μF = 106<br>100 μF = 107                        | M = ±20%                     | A = Standard      | N = Straight Lead<br>J = Leads formed in<br>L = Leads formed out | 03 = 3<br>05 = 5<br>10 = 10     |

### CAPACITANCE (μF)

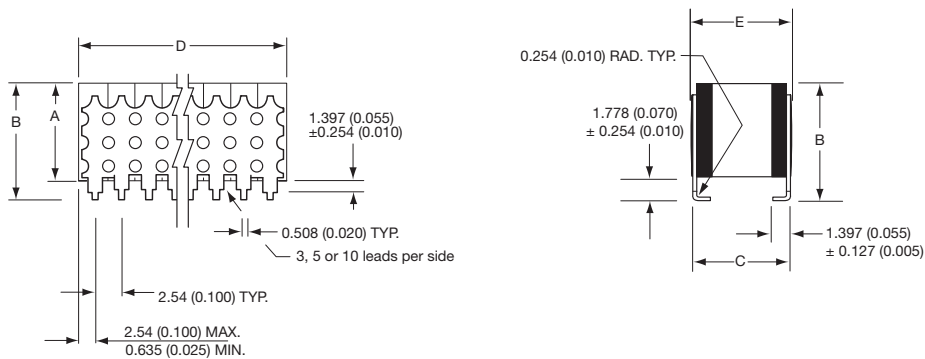
| Cap (μF) | ST12  |       | ST20    |       |       |
|----------|-------|-------|---------|-------|-------|
|          | 50V   | 100V  | Voltage |       |       |
|          | 50V   | 100V  | 25V     | 50V   | 100V  |
| .82      |       |       |         |       |       |
| 1.3      |       |       |         |       |       |
| 2.7      |       |       |         |       |       |
| 8.2      |       | ...03 |         |       |       |
| 12       |       | ...05 |         |       |       |
| 14       |       |       |         |       | ...03 |
| 18       | ...03 |       |         |       |       |
| 22       |       | ...10 |         |       | ...05 |
| 27       | ...05 |       |         | ...03 |       |
| 47       |       |       |         | ...05 | ...10 |
| 50       | ...10 |       |         |       |       |
| 68       |       |       | ...03   |       |       |
| 100      |       |       | ...05   | ...10 |       |
| 220      |       |       | ...10   |       |       |

# TurboCap™

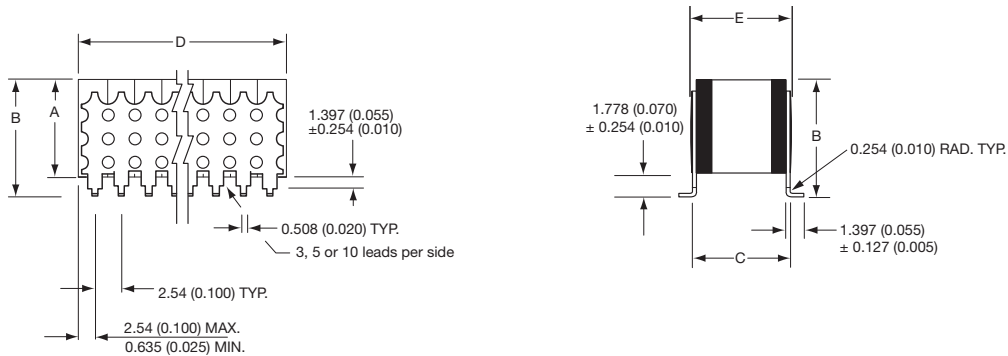
## High-CV SMPS Capacitors



“N” STYLE LEADS



“J” STYLE LEADS



“L” STYLE LEADS

## DIMENSIONS

millimeters (inches)

| Style          | A (max.)     | B (max.)*    | C<br>± 0.635 (± 0.025) | D (max.)     | E (max.)     | Lead Style | No. of Leads Per Side |
|----------------|--------------|--------------|------------------------|--------------|--------------|------------|-----------------------|
| ST125C***M*N03 | 3.56 (0.140) | 5.21 (0.205) | 5.08 (0.200)           | 10.8 (0.425) | 6.35 (0.250) | N          | 03                    |
| ST125C***M*N05 | 3.56 (0.140) | 5.21 (0.205) | 5.08 (0.200)           | 15.9 (0.625) | 6.35 (0.250) | N          | 05                    |
| ST125C***M*N10 | 3.56 (0.140) | 5.21 (0.205) | 5.08 (0.200)           | 27.9 (1.100) | 6.35 (0.250) | N          | 10                    |
| ST205C***M*N03 | 5.59 (0.220) | 7.24 (0.285) | 6.35 (0.250)           | 9.5 (0.375)  | 7.62 (0.300) | N          | 03                    |
| ST205C***M*N05 | 5.59 (0.220) | 7.24 (0.285) | 6.35 (0.250)           | 14.6 (0.575) | 7.62 (0.300) | N          | 05                    |
| ST205C***M*N10 | 5.59 (0.220) | 7.24 (0.285) | 6.35 (0.250)           | 27.3 (1.075) | 7.62 (0.300) | N          | 10                    |

\*The “B” dimension is defined for the “N” Style leads. The “L” and “J” Style Leads are 0.381 (0.015) longer. The ST12 will be 5.89 (0.220), the ST20 will be 7.62 (0.300).