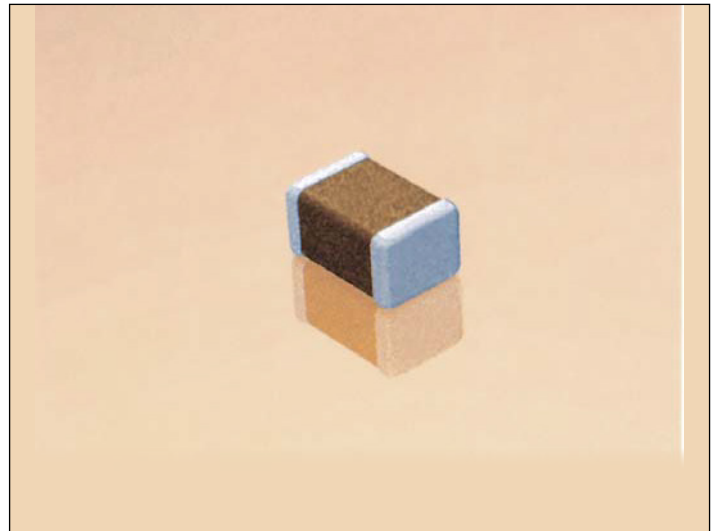


# MLC Chip Capacitors

## Tip & Ring Chips

AVX "Tip & Ring" or "ring detector" Multilayer Ceramic Chip Capacitors are designed as a standard telecom filter to block -48 Volts DC telephone line voltage and pass subscriber's AC signal pulse (16 to 25Hz, 70 to 90Vrms). The typical ringing signal is seen on figure on page 132. The ringer capacitors replace large leaded film capacitors and are ideal for telecom/modem applications. Using AVX "Tip & Ring" capacitors not only saves valuable real estate on the board and reduces the weight of overall product, but also features standard surface mounting capabilities, so critical to new and compact designs.

The AVX "Tip & Ring" capacitors are offered in standard EIA sizes and standard values. They offer excellent high frequency performance, low ESR and improved temperature performance over film capacitors.



## HOW TO ORDER

**1812**

**AVX Style**  
0805  
1206  
1210  
1808  
1812  
1825  
2220  
2225

**P**

**Voltage**  
250 VDC  
Telco  
Rating

**C**

**Temperature Coefficient**  
X7R

**104**

**Capacitance Code**  
(2 significant digits + no. of zeros)  
Examples:  
1,000 pF = 102  
22,000 pF = 223  
220,000 pF = 224  
1 μF = 105

**K**

**Capacitance Tolerance**  
K = ±10%  
M = ±20%

**A**

**Test Level**  
A = Standard

**T**

**Termination**  
T = P l a t e d1 or 2 = 7" Reel  
Ni and Sn<sub>3</sub> or 4 = 13" Reel  
(RoHS Compliant)  
9 = Bulk  
Z = F L E X I T E R M<sup>®</sup>  
100% Tin  
(RoHS Compliant)

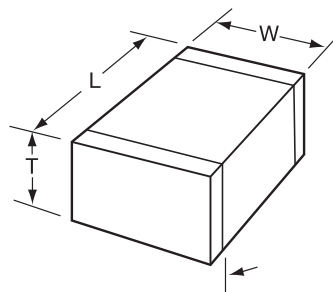
**1**

**Packaging**  
d1 or 2 = 7" Reel  
Sn<sub>3</sub> or 4 = 13" Reel  
9 = Bulk

**A**

**Special Code**  
A = Standard

Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.



## DIMENSIONS

millimeters (inches)

| Style         | 0805                           | 1206                           | 1210*                          | 1808*                          | 1812*                          | 1825*                          | 2220*                          | 2225*                          |
|---------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| (L) Length    | 2.01 ± 0.20<br>(0.079 ± 0.008) | 3.20 ± 0.20<br>(0.126 ± 0.008) | 3.2 ± 0.20<br>(0.126 ± 0.008)  | 4.57 ± 0.25<br>(0.180 ± 0.010) | 4.50 ± 0.30<br>(0.177 ± 0.012) | 4.50 ± 0.30<br>(0.177 ± 0.012) | 5.60 ± 0.30<br>(0.220 ± 0.012) | 5.60 ± 0.25<br>(0.220 ± 0.010) |
| (W) Width     | 1.25 ± 0.20<br>(0.049 ± 0.008) | 1.60 ± 0.20<br>(0.063 ± 0.008) | 2.50 ± 0.20<br>(0.098 ± 0.008) | 2.03 ± 0.25<br>(0.080 ± 0.010) | 3.2 ± 0.20<br>(0.126 ± 0.008)  | 6.34 ± 0.30<br>(0.252 ± 0.012) | 5.10 ± 0.40<br>(0.200 ± 0.016) | 6.35 ± 0.25<br>(0.250 ± 0.010) |
| (T) Thickness | 1.30 max.<br>(0.051 max.)      | 1.50 max.<br>(0.059 max.)      | 1.78 max.<br>(0.070 max.)      | 1.78 max.<br>(0.070 max.)      | 2.00 max.<br>(0.080 max.)      | 2.00 max.<br>(0.080 max.)      | 2.00 max.<br>(0.080 max.)      | 2.00 max.<br>(0.080 max.)      |
| (t) terminal  | 0.50 ± 0.25<br>(0.020 ± 0.010) | 0.50 ± 0.25<br>(0.020 ± 0.010) | 0.50 ± 0.25<br>(0.020 ± 0.010) | 0.63 ± 0.38<br>(0.025 ± 0.015) | 0.63 ± 0.38<br>(0.025 ± 0.015) | 0.63 ± 0.38<br>(0.025 ± 0.015) | 0.63 ± 0.38<br>(0.025 ± 0.015) | 0.63 ± 0.38<br>(0.025 ± 0.015) |

\*Reflow Soldering Only

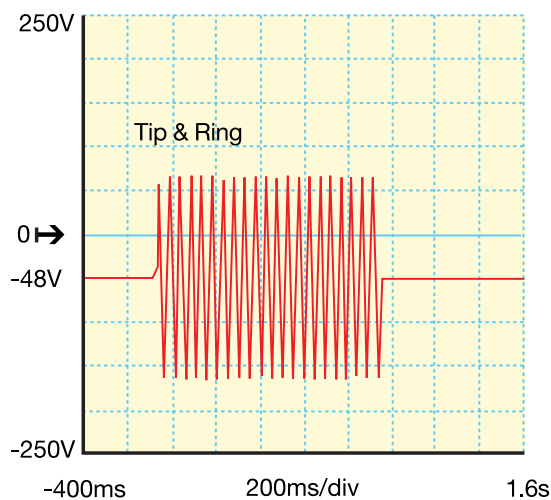
# MLC Chip Capacitors

## Tip & Ring Chips

### CAPACITANCE RANGE (MF)

| Size | 0805   | 1206   | 1210   | 1808  | 1812 | 1825 | 2220 | 2225 |
|------|--------|--------|--------|-------|------|------|------|------|
| min. | 0.0010 | 0.0010 | 0.0010 | 0.010 | 0.10 | 0.33 | 0.47 | 0.47 |
| max. | 0.027  | 0.082  | 0.22   | 0.27  | 0.47 | 1.0  | 1.0  | 1.2  |

### “TIP & RING” GRAPH



### PERFORMANCE CHARACTERISTICS

|                             |  |
|-----------------------------|--|
| Capacitance Range           | 1000 pF to 1.2 $\mu$ F (25°C, 1.0 $\pm$ 0.2 Vrms at 1kHz)      |
| Capacitance Tolerances      | $\pm$ 10%, $\pm$ 20%   |
| Dissipation Factor          | 2.5% max. (25°C, 1.0 $\pm$ 0.2 Vrms at 1kHz)                   |
| Operating Temperature Range | -55°C to +125°C  |
| Temperature Characteristic  | X7R $\pm$ 15% (0 VDC)  |
| Voltage Rating              | 250 VDC Telco rating   |
| Insulation Resistance       | 1000 megohm-microfarad min.                                    |
| Dielectric Strength         | Minimum 200% rated voltage for 5 seconds at 50 mA max. current |

# Mouser Electronics

Authorized Distributor

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## KYOCERA AVX:

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[1206PC472KAT1A](#) [1206PC473KAT1A](#) [1210PC104KAT1A](#) [1210PC473KAT1A](#) [1812PC104KAT1A](#)  
[1812PC124KAT1A](#) [1812PC154KAT1A](#) [1812PC184KAT1A](#) [1812PC222KAT1A](#) [1812PC224KAT1A](#)  
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[2225PC564KAT1A](#) [2225PC684KAT1A](#) [2225PC824KAT1A](#) [1210PC333KAT1A](#) [1812PC102KAT1A](#)  
[1812PC102KAT1AJ](#) [1825PC105KAZ1A](#) [1206PC333KAT](#) [1206PC563KAT](#) [0805PC472KAT](#) [1206PC332KAT](#)  
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[0805PC183KAT1A](#) [0805PC192KAT1A](#) [0805PC222KAT1A](#) [0805PC223KAT1A](#) [0805PC472KAT1A](#)