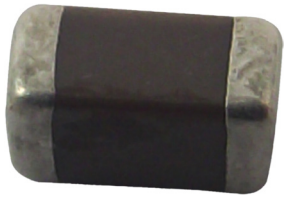
# Multilayer SMD Ceramic Capacitors
## High Capacitance Series



### Description

MLCC consists of a conducting material and electrodes. To manufacture a chip-type SMT and achieve miniaturization, high density and high efficiency, ceramic condensers are used.

High capacitance MLCC offers low ESR and excellent frequency characteristics to be suited for coupling and de coupling applications in circuit. The high dielectric constant material X5R is used for this series product.

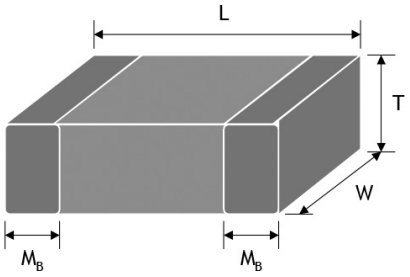
### Features

- Small size with high capacitance.
- Capacitor with lead-free termination (pure Tin).

### Applications

- Digital circuit coupling or de coupling applications.
- For high frequency and high-density type power suppliers.
- For bypassing.

### External Dimensions




| Size Inch (mm) | L (mm) | W (mm) | T (mm) | MB (mm) |
|---|---|---|---|---|
| MC1206 | 3.2 ±0.15 | 1.6 ±0.15 | 0.95 ±0.1 | 0.6 ±0.2 |
| | | | 1.25 ±0.1 | |
| | 3.2 ±0.2 | 1.6 ±0.2 | 1.6 ±0.2 | |
| | | | 1.15 ±0.15 | |
| | 3.2 +0.3/-0.1 | 1.6 +0.3/-0.1 | 1.6 +0.3/-0.1 | |

### General Electrical Data

| | |
|---|---|
| Dielectric | X5R |
| Size | MC1206 |
| Capacitance range* | 0.027µF to 100µF |
| Capacitance tolerance** | K (±10%), M (±20%) |
| Rated voltage (WVDC) | 6.3V, 10V, 16V, 25V, 50V, 100V |
| DF(Tan δ)* | Note 1 |
| Operating temperature | -55°C to +85°C |
| Capacitance characteristic | ±15% |
| Termination | Ni/Sn (lead-free termination) |

* Measured at 1 ±0.2Vrms, 1kHz ±10% for C≤10μF; 0.5 ±0.2Vrms, 120Hz ±20% for C>10μF, 30 to 70% related humidity, 25°C ambient temperature for X5R.

** Preconditioning for Class II MLCC: Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition for 24 ±2 hours before measurement.

**Note 1:**

X5R

| Rated vol. | D.F. ≦ | Exception of D.F. ≦ | |
|---|---|---|---|
| ≧50V | ≦2.5% | ≦3% | MC1206 ≧0.47μF |
| | | ≦10% | MC1206 ≧4.7μF |
| 25V | ≦3.5% | ≦7% | MC1206 ≧4.7μF |
| | | ≦10% | MC1206 ≧6.8μF |
| 16V | ≦3.5% | ≦5% | MC1206 ≧2.2μF |
| | | ≦10% | MC1206 ≧4.7μF |
| 10V | ≦5% | ≦10% | MC1206≧2.2μF |
| 6.3V | ≦10 | ≦15% | MC1206≧47μF |

## X5R Dielectric

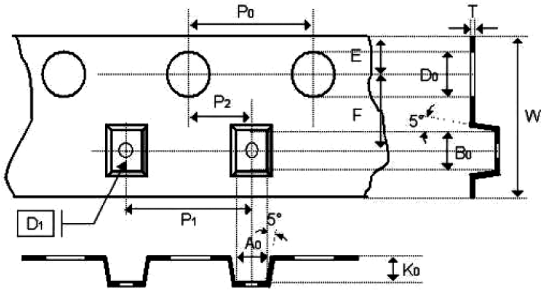
| Dielectric | | X5R | | | | |
|---|---|---|---|---|---|---|
| Size | | MC1206 | | | | |
| Rated Voltage (V DC) | | 6.3 | 10 | 16 | 25 | 50 |
| Capacitance | 1.5μF (155) | | J | J | | |
| | 2.2μF (225) | | J | J | P | |
| | 3.3μF (335) | | P | P | P | |
| | 4.7μF (475) | P | P | P | P | P |
| | 6.8uF (685) | P | P | | | |
| | 10μF (106) | P | P | P | P | |
| | 22μF (226) | P | P | P | | |
| | 47μF (476) | P | P | | | |
| | 100μF (107) | P | | | | |

## Packaging Style

| Size | Thickness (mm)/Symbol | |
|---|---|---|
| MC1206 | 0.95 ±0.1 | C |
| | 1.15 ±0.15 | J |
| | 1.25 ±0.1 | D |
| | 1.6 ±0.2 | G |
| | 1.6 +0.3/-0.1 | P |

## Appendixes

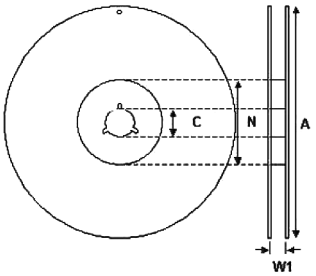
### Tape & reel dimensions




**Tape Dimension**

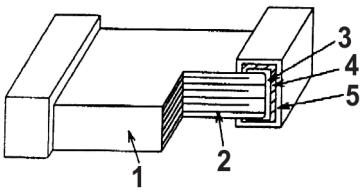
| Size | MC1206 | | |
|---|---|---|---|
| **Thickness** | **B** | **C, J, D** | **G,P** |
| **A0** | 2 ±0.1 | <1.85 | <1.95 |
| **B0** | 3.5 ±0.1 | <3.46 | <3.67 |
| **T** | 0.95 ±0.05 | 0.23 ±0.05 | 0.23 ±0.05 |
| **K0** | - | <2.5 | <2.5 |
| **W** | 8 ±0.1 | 8 ±0.1 | 8 ±0.1 |
| **P0** | 4 ±0.1 | 4 ±0.1 | 4 ±0.1 |
| **10xP0** | 40 ±0.1 | 40 ±0.1 | 40 ±0.1 |
| **P1** | 4 ±0.1 | 4 ±0.1 | 4 ±0.1 |
| **P2** | 2 ±0.05 | 2 ±0.05 | 2 ±0.05 |
| **D0** | 1.5 ±0.05 | 1.5 ±0.05 | 1.5 ±0.05 |
| **D1** | - | 1 ±0.1 | 1 ±0.1 |
| **E** | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 |
| **F** | 3.5 ±0.05 | 3.5 ±0.05 | 3.5 ±0.05 |

**Reel Dimension**




| Size | MC1206 | | |
|---|---|---|---|
| **Reel size** | **7”** | **10”** | **13”** |
| **C** | 13 +0.5/-0.2 | 13 +0.5/-0.2 | 13 +0.5/-0.2 |
| **W1** | 8.4 +1.5/-0 | 8.4 +1.5/-0 | 8.4 +1.5/-0 |
| **A** | 178 ±0.1 | 250 ±1.0 | 330 ±1 |
| **N** | 60 +1/-0 | 100 ±1.0 | 100 ±1 |

### Constructions




| No. | Name | | X5R |
|---|---|---|---|
| 1 | Ceramic material | | $BaTiO_3$ based |
| 2 | Inner electrode | | Ni |
| 3 | Termination | Inner layer | Cu |
| 4 | | Middle layer | Ni |
| 5 | | Outer layer | Sn (Matt) |

### Part Number Table

| Description | Part Number |
|---|---|
| Capacitor, 10µF, 16V, X5R, 1206 | MC1206X106K160CT |
| Capacitor, Ceramic, 10µF, 25V, X5R, 1206 | MC1206X106K250CT |
| Capacitor, 22µF, 10V, X5R, 1206 | MC1206X226M100CT |
| Capacitor, 22µF, 6.3V, X5R, 20%, 1206 | MC1206X226M6R3CT |