



## Features

- Thick film
- High voltage
- Wide resistance range
- RoHS compliant\*
- UL/IEC 60950 & 60065 compatible
-  UL 1676 recognized

## Applications

- High voltage applications
- Consumer electronics

# CHV Series - Thick Film High Voltage Chip Resistors

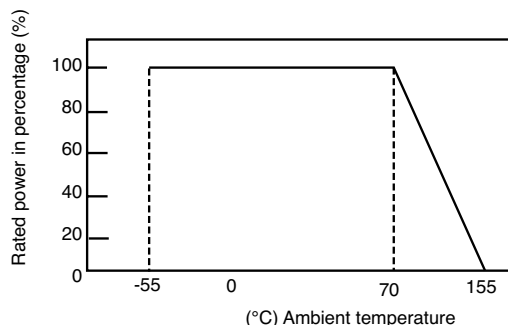
## Electrical Characteristics

| Specification               |                    | Model             |         |                 |         |         |
|-----------------------------|--------------------|-------------------|---------|-----------------|---------|---------|
|                             |                    | CHV0603           | CHV0805 | CHV1206         | CHV2010 | CHV2512 |
| Power Rating @ 70 °C        |                    | 0.1 W             | 0.125 W | 0.25 W          | 0.5 W   | 1.0 W   |
| Operating Temperature Range |                    | -55 °C to +155 °C |         |                 |         |         |
| Maximum Working Voltage     |                    | 200 V             | 400 V   | 800 V           | 2000 V  | 3000 V  |
| Maximum Overload Voltage    |                    | 400 V             | 800 V   | 1600 V          | 3000 V  | 4000 V  |
| Resistance Range            | 1 %<br>E-96 + E-24 | 100 kΩ ~ 10 MΩ    |         |                 |         |         |
|                             | 5 %<br>E-24        | 100 kΩ ~ 22 MΩ    |         | 100 kΩ ~ 100 MΩ |         |         |
| Temperature Coefficient     | 1 %                | ±100 PPM/°C       |         |                 |         |         |
|                             | 5 %                | ±200 PPM/°C       |         |                 |         |         |

## Environmental Characteristics

| Test                                    | Conditions                                                                                                        | Specification                                                                 |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Short Time Overload                     | 2 times rated voltage or max overload voltage for 5 seconds                                                       | $\Delta R \leq \pm (1 \% + 0.1 \Omega)$                                       |
| Solderability                           | +245 ±5 °C for 3 ± 0.5 seconds                                                                                    | Over 95 % coverage                                                            |
| Resistance to Solder Heat               | +260 ±5 °C for 10 ±1 seconds                                                                                      | $\Delta R \leq \pm (1 \% + 0.1 \Omega)$                                       |
| Load Life Humidity                      | +40 ±2 °C, 90~95 %<br>1.5 hours ON, 0.5 hours OFF<br>for 1000 hours at rated power                                | $\Delta R \leq \pm (5 \% + 0.1 \Omega)$                                       |
| Load Life                               | +70 °C<br>1.5 hours ON, 0.5 hours OFF<br>for 1000 hours at rated power                                            | $\Delta R \leq \pm (5 \% + 0.1 \Omega)$                                       |
| Temperature Cycle                       | -55 °C (30 minutes),<br>+25 °C (2~3 minutes),<br>+155 °C (30 minutes),<br>+25 °C (2~3 minutes)<br>for five cycles | $\Delta R \leq \pm (5 \% + 0.05 \Omega)$                                      |
| Voltage Coefficient of Resistance (VCR) | Max. Test Voltage: 500 V<br>VL: 10 % RCWV or Max. RCWV<br>VH: 100 % RCWV or Max. RCWV                             | R ≤ 1 MΩ: ±100 ppm/V<br>1 MΩ < R < 10 MΩ: ±200 ppm/V<br>R ≥ 10 MΩ: ±300 ppm/V |

## Derating Curve



## Agency Recognition

| Description |                      |
|-------------|----------------------|
| UL1676      | File Number: E466353 |

## How to Order

### CHV 2512 - F X - 1000 E LF

Model             
(CHV = Thick Film  
High Voltage  
Chip Resistor)

Size             
• 0603 • 2010  
• 0805 • 2512  
• 1206

Resistance Tolerance             
F = ±1 % (Use with "X"  
TCR Code)  
J = ±5 % (Use with "W"  
TCR Code)

TCR             
X = ±100 PPM/°C  
W = ±200 PPM/°C

Resistance Value             
1 % Tolerance: First three digits are  
significant, fourth digit represents  
the number of zeroes to follow  
5 % Tolerance: First two digits are  
significant, third digit represents  
the number of zeroes to follow

Packaging             
E = Paper tape:  
• 5,000 pcs. on 7 " plastic reel  
(CHV0603, CHV0805, CHV1206)  
• 4,000 pcs. on 7 " plastic reel  
(CHV2010, CHV2512)

Termination             
LF = Tin-plated (RoHS compliant)

\* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

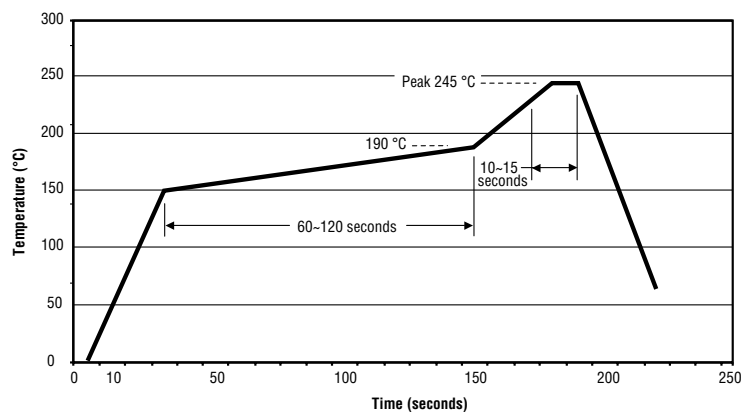
\*\*Bourns® products have not been specifically designed and tested for FDA Class III applications and their use in such applications is neither recommended nor supported. Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

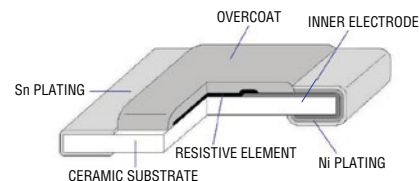
# CHV Series - Thick Film High Voltage Chip Resistors

**BOURNS®**

## Soldering Profile

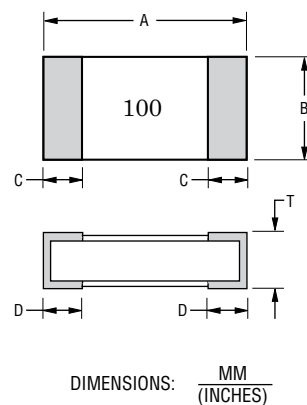


## Construction



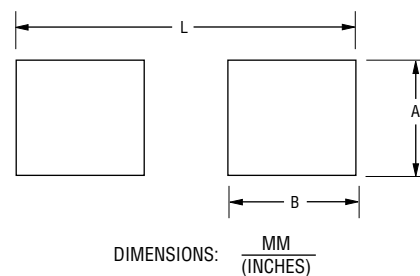
## Product Dimensions

| Dim. | Model                                     |                                           |                                           |                                           |                                           |
|------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
|      | CHV0603                                   | CHV0805                                   | CHV1206                                   | CHV2010                                   | CHV2512                                   |
| A    | $\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$ | $\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$ | $\frac{3.10 \pm 0.10}{(0.122 \pm 0.004)}$ | $\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$ | $\frac{6.40 \pm 0.20}{(0.252 \pm 0.008)}$ |
| B    | $\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$ | $\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$ | $\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$ | $\frac{2.50 \pm 0.20}{(0.098 \pm 0.008)}$ | $\frac{3.20 \pm 0.20}{(0.126 \pm 0.008)}$ |
| C    | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ | $\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$ | $\frac{0.50 \pm 0.20}{(0.020 \pm 0.008)}$ | $\frac{0.65 \pm 0.25}{(0.026 \pm 0.010)}$ | $\frac{0.65 \pm 0.25}{(0.026 \pm 0.010)}$ |
| D    | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ | $\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$ | $\frac{0.50 \pm 0.20}{(0.020 \pm 0.008)}$ | $\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$ | $\frac{0.90 \pm 0.25}{(0.035 \pm 0.010)}$ |
| T    | $\frac{0.45 \pm 0.10}{(0.018 \pm 0.004)}$ | $\frac{0.50 \pm 0.10}{(0.020 \pm 0.004)}$ | $\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$ | $\frac{0.60 \pm 0.10}{(0.024 \pm 0.004)}$ | $\frac{0.60 \pm 0.15}{(0.024 \pm 0.006)}$ |



## Recommended Land Pattern

| Dim. | Model                  |                        |                        |                        |                        |
|------|------------------------|------------------------|------------------------|------------------------|------------------------|
|      | CHV0603                | CHV0805                | CHV1206                | CHV2010                | CHV2512                |
| A    | $\frac{0.90}{(0.035)}$ | $\frac{1.30}{(0.051)}$ | $\frac{1.80}{(0.071)}$ | $\frac{3.00}{(0.118)}$ | $\frac{3.70}{(0.146)}$ |
| B    | $\frac{1.00}{(0.039)}$ | $\frac{1.15}{(0.045)}$ | $\frac{1.30}{(0.051)}$ | $\frac{1.50}{(0.059)}$ | $\frac{1.60}{(0.063)}$ |
| L    | $\frac{3.00}{(0.118)}$ | $\frac{3.50}{(0.138)}$ | $\frac{4.70}{(0.185)}$ | $\frac{6.80}{(0.268)}$ | $\frac{7.60}{(0.299)}$ |



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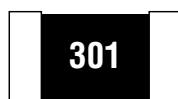
## Resistor Markings

CHV0603  
CHV0805  
CHV1206  
CHV2010  
CHV2512

CHV0805  
CHV1206  
CHV2010  
CHV2512

CHV0603

CHV0603



3-Digit  
E-24  $\pm 5\%$  Marking

$30 \times 10^1$   
Value = 300 ohms



4-Digit  
E-96/E-24 Marking

$154 \times 10^2$   
Value = 15.4K ohms



3-Digit  
E-24  $\pm 1\%$  Marking

$222 \times 10^2$   
Value = 2.2K ohms



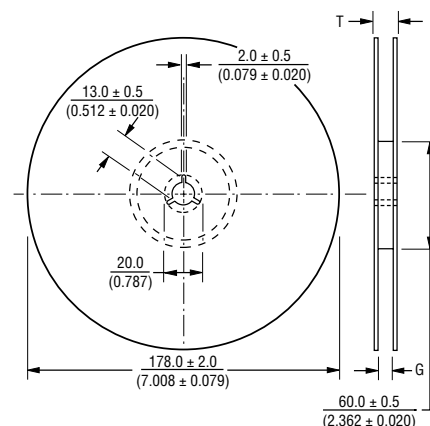
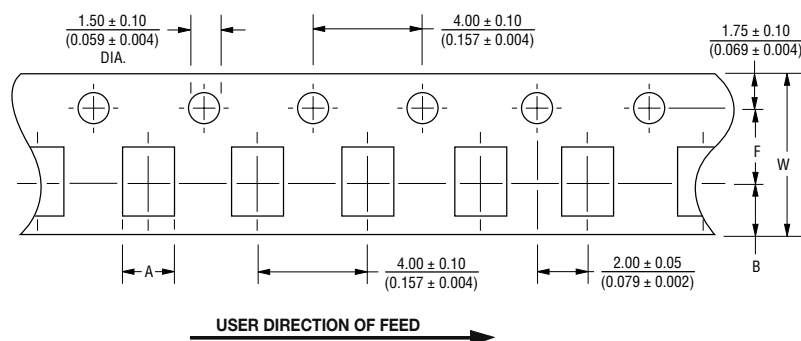
3-Digit  
E-96  $\pm 1\%$  Marking

$10 \times 10^0$   
Value = 10 ohms

## Marking Explanation

- The chip color is red to identify high voltage product.
- 1 % Tolerance: 4 digits, first three digits are significant, fourth digit represents the number of zeros to follow.
- 5 % Tolerance: 3 digits, first two digits are significant, third digit represents the number of zeros to follow.

## Packaging Dimensions - Tape



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

| Dim. | Model                                     |                                           |                                           |                                            |                                            |
|------|-------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------------------------|
|      | CHV0603                                   | CHV0805                                   | CHV1206                                   | CHV2010                                    | CHV2512                                    |
| A    | $\frac{1.10 \pm 0.20}{(0.043 \pm 0.008)}$ | $\frac{1.60 \pm 0.20}{(0.063 \pm 0.008)}$ | $\frac{2.00 \pm 0.20}{(0.079 \pm 0.008)}$ | $\frac{2.80 \pm 0.20}{(0.110 \pm 0.008)}$  | $\frac{3.50 \pm 0.20}{(0.138 \pm 0.008)}$  |
| B    | $\frac{1.90 \pm 0.30}{(0.075 \pm 0.012)}$ | $\frac{2.40 \pm 0.30}{(0.094 \pm 0.012)}$ | $\frac{3.57 \pm 0.30}{(0.141 \pm 0.012)}$ | $\frac{5.50 \pm 0.30}{(0.217 \pm 0.012)}$  | $\frac{6.70 \pm 0.30}{(0.264 \pm 0.012)}$  |
| W    | $\frac{8.00 \pm 0.05}{(0.315 \pm 0.002)}$ | $\frac{8.00 \pm 0.05}{(0.315 \pm 0.002)}$ | $\frac{8.00 \pm 0.05}{(0.315 \pm 0.002)}$ | $\frac{12.00 \pm 0.05}{(0.472 \pm 0.002)}$ | $\frac{12.00 \pm 0.05}{(0.472 \pm 0.002)}$ |
| F    | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$  | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$  |
| G    | $\frac{10.0 \pm 1.5}{(0.394 \pm 0.059)}$  | $\frac{10.0 \pm 1.5}{(0.394 \pm 0.059)}$  | $\frac{10.0 \pm 1.5}{(0.394 \pm 0.059)}$  | $\frac{13.8 \pm 1.5}{(0.543 \pm 0.059)}$   | $\frac{13.8 \pm 1.5}{(0.543 \pm 0.059)}$   |
| T    | $\frac{14.9}{(0.587)}$                    | $\frac{14.9}{(0.587)}$                    | $\frac{14.9}{(0.587)}$                    | $\frac{16.7}{(0.657)}$                     | $\frac{16.7}{(0.657)}$                     |

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