



## Features

- Thick film
- High working voltage
- Wide resistance range
- RoHS compliant\*
- UL/IEC 60950 & 60065 compatible
- UL 1676 recognized
- AEC-Q200 compliant

## Applications

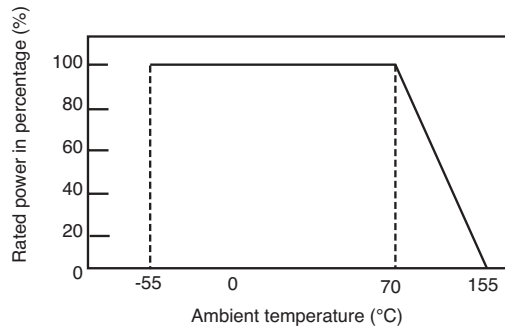
- Higher voltage applications
- Consumer electronics

## CHV-A Series – Thick Film High Voltage Chip Resistors

### Electrical Characteristics

Specification	Model				
	CHV-0603A	CHV-0805A	CHV-1206A	CHV-2010A	CHV-2512A
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 % E-96 + E-24	100 kΩ ~ 10 MΩ			
	5 % E-24	100 kΩ ~ 22 MΩ	100 kΩ ~ 100 MΩ		
Temperature Coefficient	1 %	±100 PPM/°C			
	5 %	±200 PPM/°C			

### Derating Curve



### Additional Information

Click these links for more information:



### Agency Recognition

Description	
UL1676	File Number: <a href="#">E466353</a>

### How to Order

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

Model \_\_\_\_\_  
 (CHV = Thick Film High Voltage Chip Resistor)

Size \_\_\_\_\_  
 • 0603 • 2010  
 • 0805 • 2512  
 • 1206

Feature \_\_\_\_\_  
 A = AEC-Q200 compliant

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 (CHV0603A, CHV0805A, CHV1206A)  
 • 4,000 pcs. on 7" plastic reel (CHV2010A, CHV2512A)

Termination \_\_\_\_\_  
 LF = Tin-plated (RoHS compliant)



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex. Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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## Environmental Characteristics

Test	Specification	Test Method (AEC-Q200, IEC 60115)
High Temperature Exposure (Storage)	J: $\Delta R \leq \pm (3\% + 0.1 \Omega)$ F: $\Delta R \leq \pm (1\% + 0.05 \Omega)$	<b>AEC-Q200 TABLE 7.3</b> 1000 hrs. @ T=125 °C. Unpowered. Measurement at 24 ±2 hours after test conclusion.
Temperature Cycling*	$\Delta R \leq \pm (1\% + 0.1 \Omega)$ No mechanical damage	<b>AEC-Q200 TABLE 7.4</b> 1000 Cycles (-55 °C to +125 °C). Measurement at 24 ±2 hours after test conclusion.
Moisture Resistance	$\Delta R \leq \pm (1\% + 0.1 \Omega)$	<b>AEC-Q200 TABLE 7.6</b> Test 65 °C / 80~100 % RH / 10 cycles. Measurement at 24 ±2 hours after test conclusion. (t=24 hrs/cycle)
Biased Humidity	J: $\Delta R \leq \pm (5\% + 0.1 \Omega)$ F: $\Delta R \leq \pm (3\% + 0.05 \Omega)$ VCR within the spec.	<b>AEC-Q200 TABLE 7.7</b> 1000 hours 85 °C / 85 % RH. 10% of operating power. Measurement at 24 ±2 hours after test conclusion.
Operational Life	J: $\Delta R \leq \pm (5\% + 0.1 \Omega)$ F: $\Delta R \leq \pm (3\% + 0.05 \Omega)$ VCR within the spec.	<b>AEC-Q200 TABLE 7.8</b> Test 1000 hrs. @ T <sub>A</sub> =125 °C at specified rated power. Measurement at 24 ±2 hours after test conclusion.
Mechanical Shock	Within product specification tolerance and no visible damage.	<b>AEC-Q200 TABLE 7.13</b> Test Peak value: 100 g's, Wave: Hail-sine, Duration: 6 ms, Velocity:12.3 ft/sec.
Vibration	No mechanical damage.	<b>AEC-Q200 TABLE 7.14</b> 5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10-2000 Hz.
Resistance to Solder Heat*	$\Delta R \leq \pm (1\% + 0.1 \Omega)$ No mechanical damage.	<b>AEC-Q200 TABLE 7.15</b> Solder dipping @ 270 °C ±5 °C for 10 sec. ±1 sec.
Thermal Shock	J: $\Delta R \leq \pm (1\% + 0.1 \Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05 \Omega)$ No mechanical damage.	<b>AEC-Q200 TABLE 7.16</b> -55 to 155 °C/ dwell time 15 min max. Transfer time 20 sec. / 300 cycles.
ESD	$\Delta R \leq \pm (1\% + 0.1 \Omega)$ No mechanical damage.	<b>AEC-Q200-002</b> Test contact min. 1 kV
Solderability*	Over 95 % of termination must be covered with solder.	<b>AEC-Q200 TABLE 7.18</b> a) Baking 155 °C 4 hours, dipping 235 °C 5 sec. b) Steam 1 hour, dipping 215 °C 5 sec. c) Steam 1 hour, dipping 260 °C 7 sec.
Flammability	Refer to UL-94.	<b>AEC-Q200 TABLE 7.20</b> UL-94 V-0 or V-1 are acceptable
Board Flex*	J: $\Delta R \leq \pm (1\% + 0.1 \Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05 \Omega)$ No mechanical damage.	<b>AEC-Q200 TABLE 7.21</b> Bending 2 mm (CHV2512A, 2010A, 1210A, 1206A) 3 mm (CHV0805A, 0603A)
Terminal Strength	No mechanical damage.	<b>AEC-Q200 TABLE 7.22</b> Force 1 Kg for 60 seconds.

Specifications are subject to change without notice.

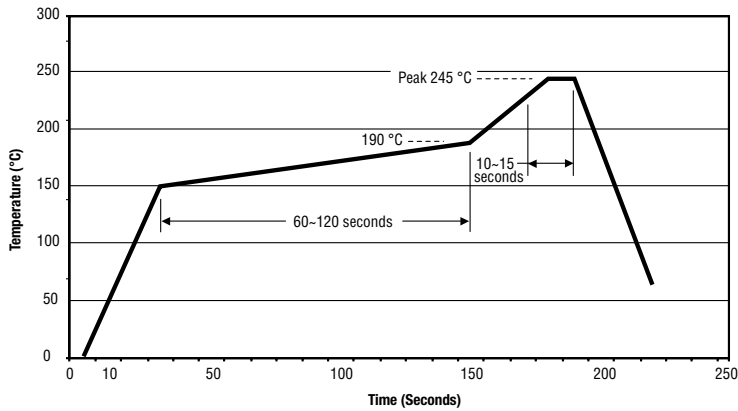
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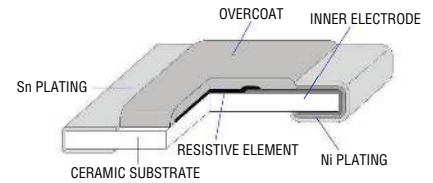
# CHV-A Series – Thick Film High Voltage Chip Resistors



## Soldering Profile

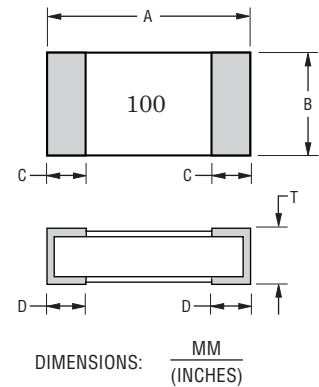


## Construction



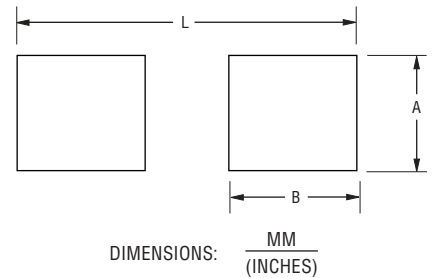
## Product Dimensions

Dim.	Model				
	CHV0603A	CHV0805A	CHV1206A	CHV2010A	CHV2512A
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				
	CHV0603A	CHV0805A	CHV1206A	CHV2010A	CHV2512A
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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# CHV-A Series – Thick Film High Voltage Chip Resistors



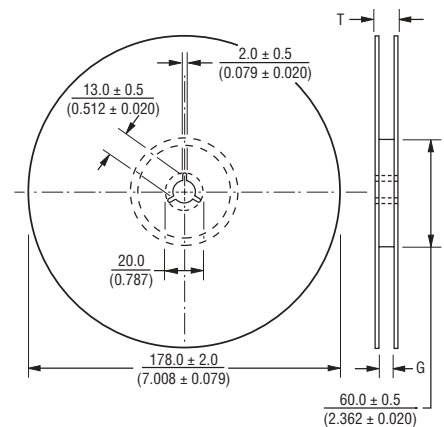
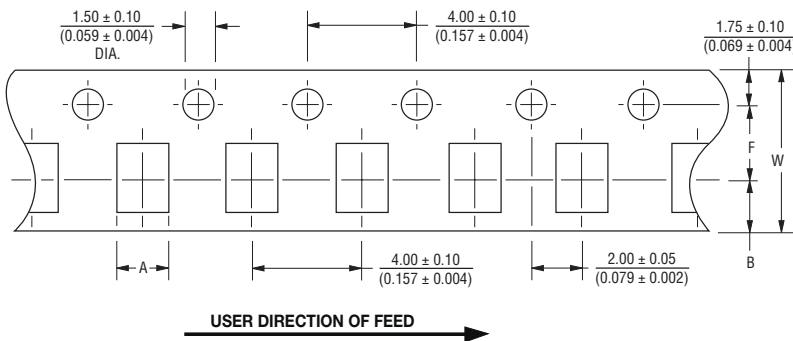
## Resistor Markings

CHV0603A CHV0805A CHV1206A CHV2010A CHV2512A	CHV0805A CHV1206A CHV2010A CHV2512A	CHV0603A	CHV0603A
3-Digit E-24 $\pm 5\%$ Marking	4-Digit E-96/E-24 Marking	3-Digit E-24 $\pm 1\%$ Marking	3-Digit E-96 $\pm 1\%$ Marking
$30 \times 10^1$ Value = 300 ohms	$154 \times 10^2$ Value = 15.4K ohms	$222 \times 10^2$ Value = 2.2K ohms	$10 \times 10^0$ 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				
	CHV0603A	CHV0805A	CHV1206A	CHV2010A	CHV2512A
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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