



Features

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

Applications

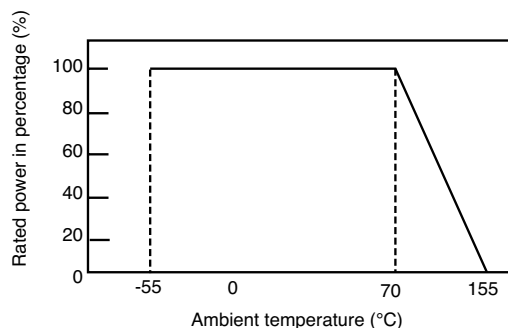
- Higher voltage applications
- Consumer electronics

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



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Agency Recognition

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

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

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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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: $\Delta R \leq \pm (1 \% + 0.05 \Omega)$ | AEC-Q200 TABLE 7.3 1000 hrs. @ T=125 °C. Unpowered. Measurement at 24 \pm 2 hours after test conclusion. |
| Temperature Cycling* | $\Delta R \leq \pm (1 \% + 0.1 \Omega)$ No mechanical damage | AEC-Q200 TABLE 7.4 1000 Cycles (-55 °C to +125 °C). Measurement at 24 \pm 2 hours after test conclusion. |
| Moisture Resistance | $\Delta R \leq \pm (1 \% + 0.1 \Omega)$ | AEC-Q200 TABLE 7.6 Test 65 °C / 80~100 % RH / 10 cycles. Measurement at 24 \pm 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. | AEC-Q200 TABLE 7.7 1000 hours 85 °C / 85 % RH. 10% of operating power. Measurement at 24 \pm 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. | AEC-Q200 TABLE 7.8 Test 1000 hrs. @ T _A =125 °C at specified rated power. Measurement at 24 \pm 2 hours after test conclusion. |
| Mechanical Shock | Within product specification tolerance and no visible damage. | AEC-Q200 TABLE 7.13 Test Peak value: 100 g's, Wave: Half-sine, Duration: 6 ms, Velocity:12.3 ft/sec. |
| Vibration | No mechanical damage. | AEC-Q200 TABLE 7.14 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. | AEC-Q200 TABLE 7.15 Solder dipping @ 270 °C \pm 5 °C for 10 sec. \pm 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. | AEC-Q200 TABLE 7.16 -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. | AEC-Q200-002 Test contact min. 1 kV |
| Solderability* | Over 95 % of termination must be covered with solder. | AEC-Q200 TABLE 7.18 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. | AEC-Q200 TABLE 7.20 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. | AEC-Q200 TABLE 7.21 Bending 2 mm (CHV2512A, 2010A, 1210A, 1206A) 3 mm (CHV0805A, 0603A) |
| Terminal Strength | No mechanical damage. | AEC-Q200 TABLE 7.22 Force 1 Kg for 60 seconds. |

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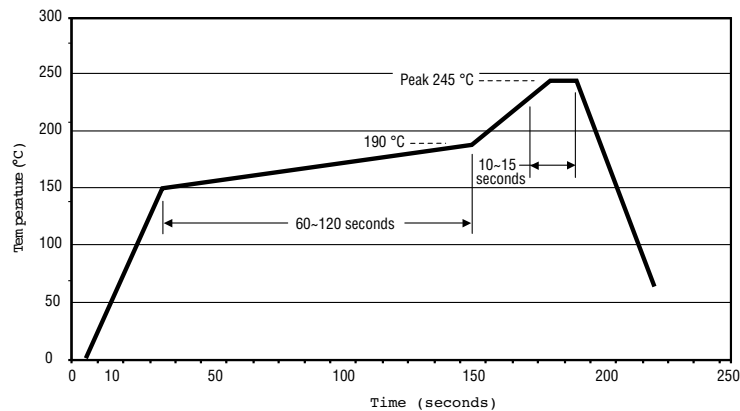
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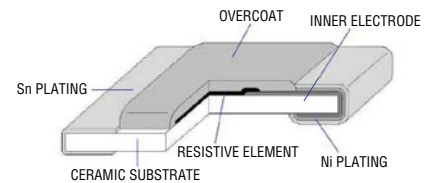
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Soldering Profile

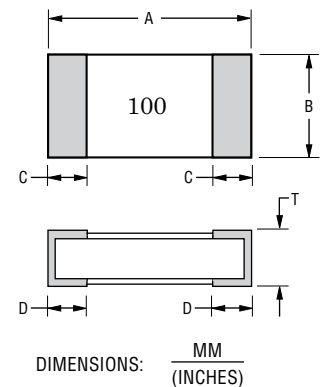


Construction



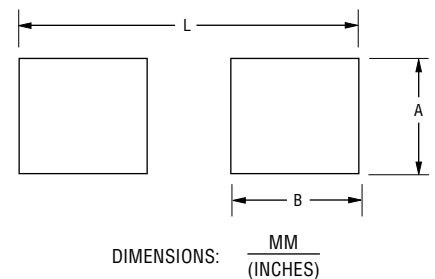
Product Dimensions

| Dim. | Model | | | | |
|------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | CHV0603A | CHV0805A | CHV1206A | CHV2010A | CHV2512A |
| A | 1.60 ± 0.10 (0.063 ± 0.004) | 2.00 ± 0.10 (0.079 ± 0.004) | 3.10 ± 0.10 (0.122 ± 0.004) | 5.00 ± 0.20 (0.197 ± 0.008) | 6.40 ± 0.20 (0.252 ± 0.008) |
| B | 0.80 ± 0.10 (0.031 ± 0.004) | 1.25 ± 0.10 (0.049 ± 0.004) | 1.60 ± 0.10 (0.063 ± 0.004) | 2.50 ± 0.20 (0.098 ± 0.008) | 3.20 ± 0.20 (0.126 ± 0.008) |
| C | 0.30 ± 0.20 (0.012 ± 0.008) | 0.40 ± 0.20 (0.016 ± 0.008) | 0.50 ± 0.20 (0.020 ± 0.008) | 0.65 ± 0.25 (0.026 ± 0.010) | 0.65 ± 0.25 (0.026 ± 0.010) |
| D | 0.30 ± 0.20 (0.012 ± 0.008) | 0.40 ± 0.20 (0.016 ± 0.008) | 0.50 ± 0.20 (0.020 ± 0.008) | 0.60 ± 0.25 (0.024 ± 0.010) | 0.90 ± 0.25 (0.035 ± 0.010) |
| T | 0.45 ± 0.10 (0.018 ± 0.004) | 0.50 ± 0.10 (0.020 ± 0.004) | 0.55 ± 0.10 (0.022 ± 0.004) | 0.60 ± 0.10 (0.024 ± 0.004) | 0.60 ± 0.15 (0.024 ± 0.006) |



Recommended Land Pattern

| Dim. | Model | | | | |
|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | CHV0603A | CHV0805A | CHV1206A | CHV2010A | CHV2512A |
| A | 0.90 (0.035) | 1.30 (0.051) | 1.80 (0.071) | 3.00 (0.118) | 3.70 (0.146) |
| B | 1.00 (0.039) | 1.15 (0.045) | 1.30 (0.051) | 1.50 (0.059) | 1.60 (0.063) |
| L | 3.00 (0.118) | 3.50 (0.138) | 4.70 (0.185) | 6.80 (0.268) | 7.60 (0.299) |



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CHV-A Series – Thick Film High Voltage Chip Resistors

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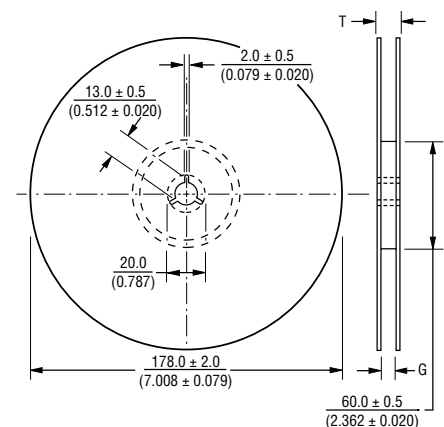
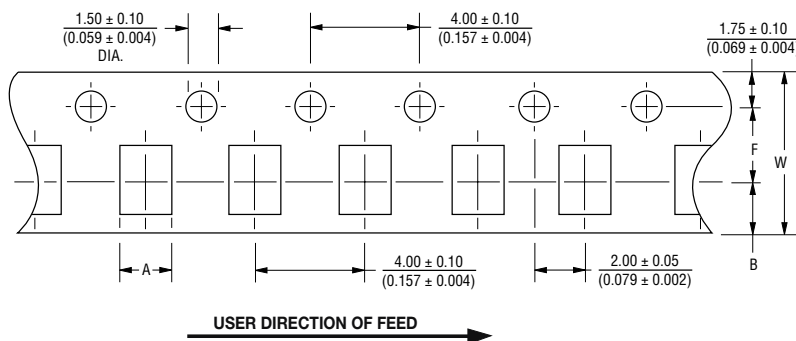
Resistor Markings

| | | | |
|--|--|--|-------------------------------------|
| 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 |
| 30×10^1 Value = 300 ohms | 154×10^2 Value = 15.4K ohms | 222×10^2 Value = 2.2K ohms | 10×10^0 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 | 1.10 ± 0.20 (0.043 \pm 0.008) | 1.60 ± 0.20 (0.063 \pm 0.008) | 2.00 ± 0.20 (0.079 \pm 0.008) | 2.80 ± 0.20 (0.110 \pm 0.008) | 3.50 ± 0.20 (0.138 \pm 0.008) |
| B | 1.90 ± 0.30 (0.075 \pm 0.012) | 2.40 ± 0.30 (0.094 \pm 0.012) | 3.57 ± 0.30 (0.141 \pm 0.012) | 5.50 ± 0.30 (0.217 \pm 0.012) | 6.70 ± 0.30 (0.264 \pm 0.012) |
| W | 8.00 ± 0.05 (0.315 \pm 0.002) | 8.00 ± 0.05 (0.315 \pm 0.002) | 8.00 ± 0.05 (0.315 \pm 0.002) | 12.00 ± 0.05 (0.472 \pm 0.002) | 12.00 ± 0.05 (0.472 \pm 0.002) |
| F | 3.50 ± 0.05 (0.138 \pm 0.002) | 3.50 ± 0.05 (0.138 \pm 0.002) | 3.50 ± 0.05 (0.138 \pm 0.002) | 5.50 ± 0.05 (0.217 \pm 0.002) | 5.50 ± 0.05 (0.217 \pm 0.002) |
| G | 10.0 ± 1.5 (0.394 \pm 0.059) | 10.0 ± 1.5 (0.394 \pm 0.059) | 10.0 ± 1.5 (0.394 \pm 0.059) | 13.8 ± 1.5 (0.543 \pm 0.059) | 13.8 ± 1.5 (0.543 \pm 0.059) |
| T | 14.9 (0.587) | 14.9 (0.587) | 14.9 (0.587) | 16.7 (0.657) | 16.7 (0.657) |

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