# Monolayer Construction Surface Mount Varistors

## Description

CH series Metal Oxide Varistors are small, very compact transient surge suppressors. They are intended for use in hybrid circuit applications in commercial and industrial equipment utilizing direct surface-mounting techniques.

These devices which encompass voltage from 11 $V_{M(AC)}$ to 300 $V_{M(AC)}$ in a 5mm by 8mm package size and have significantly lower profiles than traditional radial-lead varistors, permit designers to reduce the size and weight and increase the reliability of their equipment designs.

## Features

- Monolayer construction technology
- Voltage rating from 11 to 300 $V_{M(AC)}$
- Energy rating up to 25 Joules
- Operating temperature range: - 40 ~ +125℃
- Storage temperature: - 50 ~ +150℃
- Compatible with most surface-mounting assembly equipment and mounting techniques
- Bilateral and symmetrical V-I characteristics curve
- Low clamping voltage, high energy absorption
- Low inductance, fast response
- High stabilization for circuit voltage

## Applications

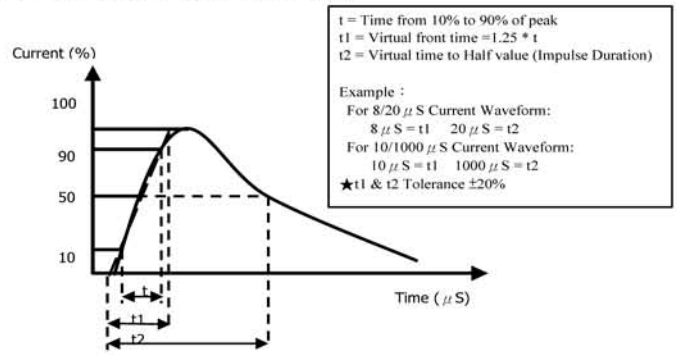
- Surface-mount chip intended for hybrid-circuit application
- PCs and peripherals
- Utility meters
- Proximity switches
- Consumer products
- Protection of various kinds of transistors、diodes、ICs、thyristors、triacs and semiconductors...etc.,

# Monolayer Construction Surface Mount Varistors

## Absolute Maximum Ratings

| **Continuous:** | **CH SERIES** | **UNITS** |
|---|---|---|
| Steady State Applied Voltage: | | |
| AC Voltage Range ($V_{M(AC)RMS}$) | 11 to 300 | V |
| DC Voltage Range ($V_{M(DC)}$) | 14 to 385 | V |
| **Transient:** | | |
| Peak Pulse Current ($I_{TM}$) | | |
| For 8/20μs Current Wave | 250 to 500 | A |
| Single Pulse Energy Range | | |
| For 10/1000μs Current Wave ($W_{TM}$) | 0.8 to 25 | J |
| Operating Ambient Temperature Range($T_A$) | -55 to 125 | ℃ |
| Storage Temperature Range ($T_{STG}$) | -55 to 150 | ℃ |
| Temperature Coefficient (αv) of Clamping Voltage ($V_C$) at Specified Test Current | ＜0.01 | % /℃ |

## Performance Characteristics

| Characteristics | Test Method/Description | Specifications |
|---|---|---|
| Standard Test Condition | Temperature range: 5 to 35℃<br>Relative humidity: 45 to 85% R.H. | ------- |
| Varistor Voltage | Voltage across the varistor measured at 1 mA DC rectangular pulse current | To meet the specified value |
| Maximum Allowable Voltage | Maximum continuous sinusoidal RMS voltage or DC voltage which may be applied within the specified environmental temperature range | |
| Maximum Clamping Voltage | Peak voltage across the varistor under condition of a specified standard impulse current (8/20μs)<br>  | |
| Withstanding Surge Current | Maximum current across the varistor measured at a given standard waveform (8/20μs) applied one time or two times at an interval of 5 minutes, and the varistor voltage change less than ±10% | |
| Rated Transient Average Power Dissipation | Maximum average power which may be dissipated due to a group of pulses occurring within a specified isolated time period, without causing device failure | |
| Maximum Energy | The maximum energy within the varistor voltage change of ±10% when one impulse of 2ms or 10/1000μs is applied | |
| Capacitance | Device Capacitance measured with zero voltage bias $1V_{P-P}$ and frequency $1MH_Z$ | |

# Monolayer Construction Surface Mount Varistors

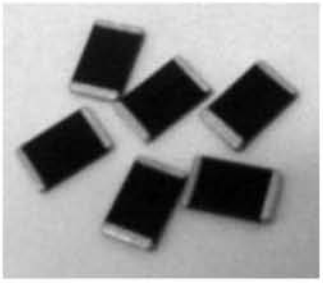
## Performance Characteristics

| Characteristics | Test Method /Description | Specifications |
|---|---|---|
| Impulse Response Time | Time lag between application of surge and varistor's "turn on" conduction action | ＜1 nanosecond |
| DC Leakage Current | Maximum current with rated DC voltage applied | 200μA max. |
| Temperature Coefficient of Varistor Voltage | (VB at 85°C －VB at 25°C) /( VB at 25°C×60) ×100(%/°C) | ＜ -0.05%/°C |
| Dry Heat/ High Temperature Storage | Varistors shall be subjected to 150 ±2°C, for 1000 Hrs in a thermostatic bath without load and then stored at room ambient condition for 1 to 2 Hrs. The variation of varistor voltage should be measured. | ΔVB/VB≦±10% |
| Damp Heat Load/ Humidity Load | Varistors shall be subjected to 40±2°C, 90 to 95%RH for 1000 Hrs in a thermostatic bath with the maximum allowable voltage continuously applied and then stored at room ambient condition for 1 to 2 Hrs. The variation of varistor voltage should be measured. | ΔVB/VB≦±10% |
| Cold / Low Temperature Storage | Varistors shall be subjected to -40±2°C for 1000 Hrs in a thermostatic bath without load and then stored at room ambient condition for 1 to 2 Hrs. The variation of varistor voltage should be measured. | ΔVB/VB≦±5% |
| Temperature Cycle (Thermal shock) | The temperature cycling listed below shall be repeated 5 times and the variation of varistor voltage should be examined and no outstanding damage visually. | ΔVB/VB≦±10% |
| Dry Heat Load/ High Temperature | Varistors shall be subjected to 125±2°C for 1000 Hrs in a thermostatic bath with maximum allowable voltage continuously applied and then stored at room ambient condition for 1 to 2 Hrs. The variation of varistor voltage should be measured. | ΔVB/VB≦±10% |

| Step | Temperature (°C) | Period |
|---|---|---|
| 1 | -40±3 | 30 minutes ±3 |
| 2 | Room Temp. | 1~2 hours |
| 3 | 125±2 | 30 minutes ±3 |
| 4 | Room Temp. | 1~2 hours |

# Monolayer Construction Surface Mount Varistors

## JV 08CH SMD



## DEVICE RATINGS AND SPECIFICATIONS

| PART NUMBER | Maximum Rating(125℃) | | | | Specifications(25℃) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum Continuous Working Voltage | | Maximum Non-Repetitive Surge Current (8/20μs) | Maximum Non-Repetitive Surge Energy (10/1000μs) | Maximum Clamping Voltage at Specified Current (8/20μs) | | Nominal Voltage at 1 mA (DC) Test Current | | | Typical Capacitance @1 MHz |
| | $V_{M(AC)}$ | $V_{M(DC)}$ | $I_{TM}$ | $W_{TM}$ | Ip | Vc | $V_{N(DC)}$ min. | $V_{N(DC)}$ | $V_{N(DC)}$ max. | C |
| | (V) | (V) | (A) | (J) | (A) | (V) | (V) | (V) | (V) | (pF) |
| JV08CH180□ | 11 | 14 | 250 | 0.8 | 5 | 36 | 16 | 18 | 20 | 3100 |
| JV08CH220□ | 14 | 18 | 250 | 0.8 | 5 | 46 | 19 | 22 | 26 | 1600 |
| JV08CH270□ | 17 | 22 | 250 | 1.0 | 5 | 54 | 23 | 27 | 31 | 1350 |
| JV08CH330□ | 20 | 26 | 250 | 1.2 | 5 | 67 | 30 | 33 | 36 | 1070 |
| JV08CH390□ | 25 | 31 | 250 | 1.5 | 5 | 75 | 35 | 39 | 43 | 900 |
| JV08CH470□ | 30 | 38 | 250 | 1.8 | 5 | 89 | 42 | 47 | 52 | 820 |
| JV08CH560□ | 35 | 45 | 250 | 2.3 | 5 | 106 | 50 | 56 | 62 | 710 |
| JV08CH680□ | 40 | 56 | 250 | 3.0 | 5 | 135 | 62 | 68 | 74 | 680 |
| JV08CH820□ | 50 | 65 | 500 | 4.2 | 10 | 135 | 74 | 82 | 90 | 530 |
| JV08CH101□ | 65 | 85 | 500 | 4.8 | 10 | 165 | 90 | 100 | 110 | 480 |
| JV08CH121□ | 75 | 102 | 500 | 6.0 | 10 | 197 | 108 | 120 | 132 | 300 |
| JV08CH151□ | 95 | 127 | 500 | 8.0 | 10 | 250 | 135 | 150 | 165 | 250 |
| JV08CH181□ | 115 | 153 | 500 | 10.0 | 10 | 290 | 162 | 180 | 198 | 200 |
| JV08CH201□ | 130 | 175 | 500 | 11.0 | 10 | 340 | 184 | 200 | 228 | 180 |
| JV08CH221□ | 140 | 180 | 500 | 12.0 | 10 | 356 | 198 | 220 | 242 | 160 |
| JV08CH241□ | 150 | 200 | 500 | 13.0 | 10 | 389 | 216 | 240 | 268 | 150 |
| JV08CH271□ | 180 | 230 | 500 | 16.0 | 10 | 455 | 243 | 270 | 297 | 120 |
| JV08CH301□ | 195 | 250 | 500 | 18.0 | 10 | 495 | 270 | 300 | 330 | 110 |
| JV08CH331□ | 210 | 275 | 500 | 19.0 | 10 | 530 | 297 | 330 | 363 | 100 |
| JV08CH361□ | 230 | 300 | 500 | 20.0 | 10 | 593 | 324 | 360 | 396 | 100 |
| JV08CH391□ | 250 | 330 | 500 | 21.0 | 10 | 647 | 351 | 390 | 429 | 90 |
| JV08CH431□ | 275 | 369 | 500 | 23.0 | 10 | 705 | 387 | 430 | 473 | 90 |
| JV08CH471□ | 300 | 385 | 500 | 25.0 | 10 | 775 | 423 | 470 | 517 | 80 |

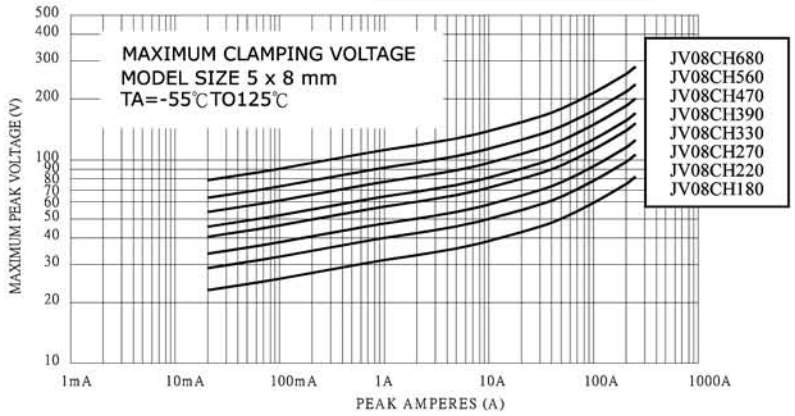
**Notes :**

1. Power dissipation of transient ＜0.25w
2. The CH series of surface mount chip varistors are for a wide range of applications, and more compatible with most surface-mounting assembly equipment.
3. No marking on the chip itself.

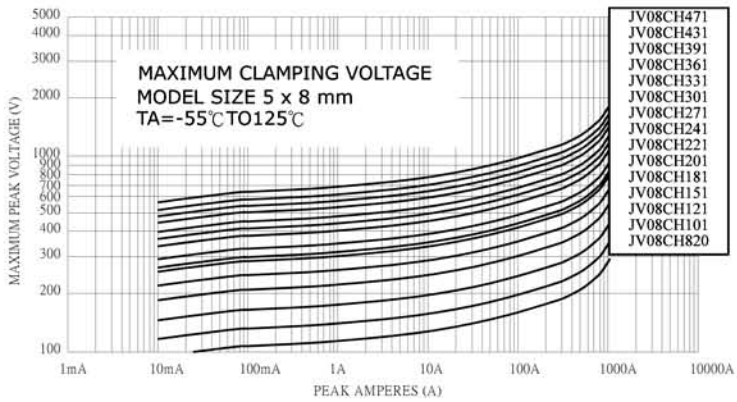
# Monolayer Construction Surface Mount Varistors

## JV 08CH SMD

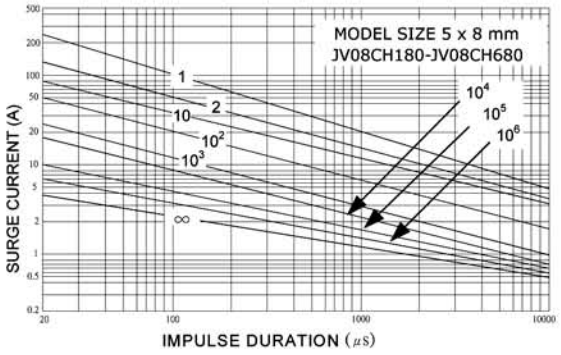
**Maximum Surge Current:** JV08CH180-JV08CH680



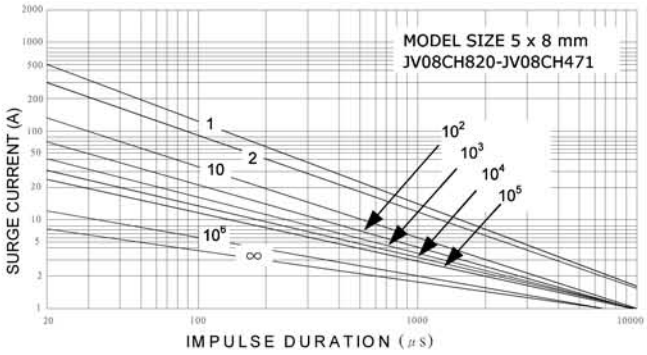

**Maximum Surge Current:** JV08CH820-JV08CH471




**Maximum Surge Current:** JV08CH180-JV08CH680



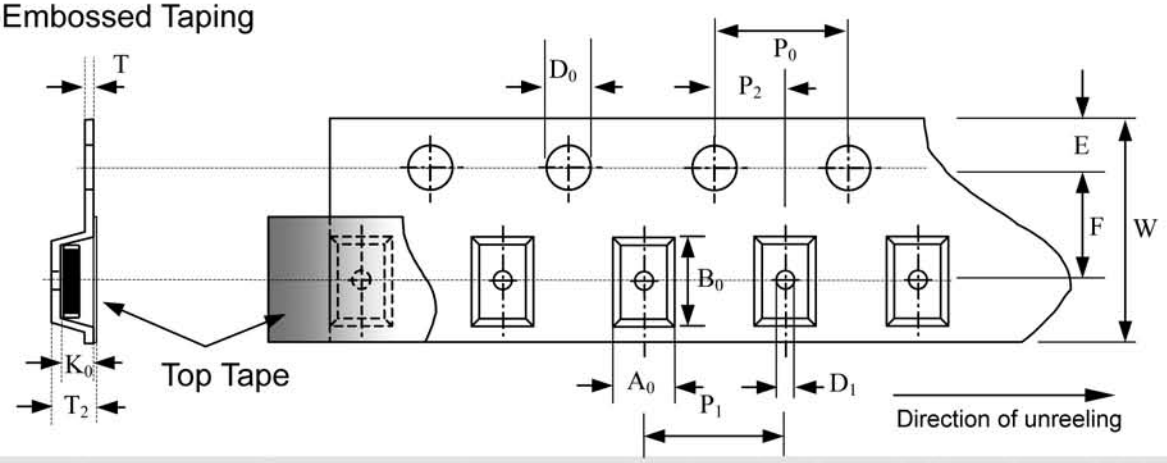

**Maximum Surge Current:** JV08CH820-JV08CH471



# Monolayer Construction Surface Mount Varistors

## Tape and Reel Specifications

◎Embossed Taping




**Tape in accordance can be supplied to IEC publication 286-3**

| Symbol / Type | DIMENSIONS (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $A_0$ ±0.1 | $B_0$ ±0.1 | W ±0.3 | F ±0.1 | E ±0.1 | $P_1$ ±0.1 | $P_2$ ±0.1 | $P_0$ ±0.1 | $\phi D_0$ +0.1, -0 | T Max. | $T_2$ Max. | $\phi D_1$ Min. |
| 08CH | 5.5 | 8.5 | 16 | 7.5 | 1.75 | 8.0 | 2.0 | 4.0 | 1.5 | 1.0 | 3.0 | 1.5 |

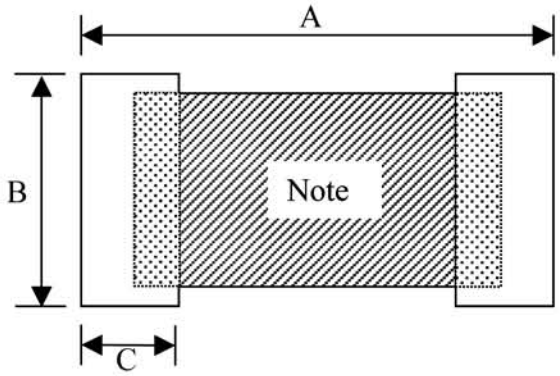
$K_0$ : Depth of Cavity: Dependent Chip Size to Minimize Rotation

## Standard Shipping Quantities

Tape & reel is the standard packaging method of the CH series. There are 1,000 pcs /reel/7 inch.

## Recommended Pad Outline

Note：Avoid metal runs in this area




| SYMBOL | INCHES | MILLIMETERS |
|---|---|---|
| A | 0.402 | 10.21 |
| B | 0.216 | 5.50 |
| C | 0.087 | 2.21 |

AsiaTronix

# Do you need more information ?

# DROP US A CALL !


**Tel. +39 02 24304651**

**Fax +39 02 24304654**

**E-mail sales@asiatronix.com**

*Design or construction of any products and technical information are subject to change without notice.*

www.asiatronix.com