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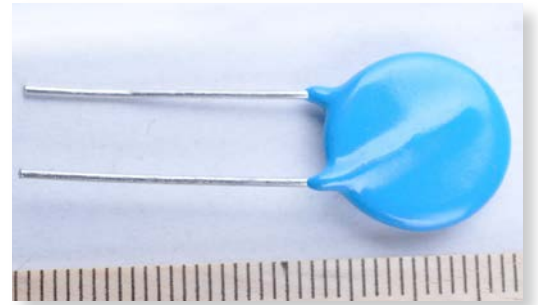
# Metal Oxide Varistors

**32D Series**

## Metal Oxide Varistors - 32D Series

### Features

1. Wide operating voltage (V1mA) range from 8V to 1800V.
2. Fast responding to transient over-voltage.
3. Large absorbing transient energy capability.
4. Low clamping ratio and no following-on current.



### General Information

The MOV-32DxxxK Series of 32mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 200 V to 1600 V and Vrms voltages from 130 V to 1000 V. The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.

### General Characteristics

No Radioactive Material Storage Temperature: -55°C to +125°C  
 Operating Temperature: -55°C to +85°C  
 Body: Nickel Plated  
 Leads: Surface-mount, Axial Devices: Tin Plated  
 Devices with No Leads: Nickel Plated

### Product Name

|               |                      |                          |                            |   |   |   |
|---------------|----------------------|--------------------------|----------------------------|---|---|---|
| 3             | 2                    | D                        | 4                          | 7 | 1 | K |
| ↓             | ↓                    | ↓                        | ↓                          | ↓ | ↓ | ↓ |
| Disc Diameter | Type                 | Nominal Varistor Voltage | Varistor Voltage Tolerance |   |   |   |
| 32=32MM       | D: Disk<br>S: Square | 471=47*10 <sup>1</sup> V | K = 10 %                   |   |   |   |

## Metal Oxide Varistors - 32D Series

### Electrical Characteristics

| Type Number | Maximum Allowable Voltage |             | Varistor Voltage<br>$V_{1mA}(V)$ | Maximum Clamping Voltage |          | Withstanding Surge Current<br>$I(A)$ | Maximum Energy<br>(10/1000 $\mu$ s)<br>(J) | Typical Capacitance<br>(Reference)<br>@1KHz(pf) |
|-------------|---------------------------|-------------|----------------------------------|--------------------------|----------|--------------------------------------|--|---|
|             | $V_{AC}(V)$               | $V_{DC}(V)$ |                                  | $I_P(A)$                 | $V_C(V)$ |                                      |  |   |
| 32D201K     | 130                       | 170         | 200(180~220)                     | 200                      | 340      | 20000                                | 250  | 5200  |
| 32D221K     | 140                       | 180         | 220(198~242)                     | 200                      | 360      | 20000                                | 270  | 5150  |
| 32D241K     | 150                       | 200         | 240(216~264)                     | 200                      | 395      | 20000                                | 290  | 5100  |
| 32D271K     | 175                       | 225         | 270(243~297)                     | 200                      | 455      | 20000                                | 300  | 4800  |
| 32D301K     | 190                       | 250         | 300(270~330)                     | 200                      | 500      | 20000                                | 330  | 4550  |
| 32D331K     | 210                       | 275         | 330(297~363)                     | 200                      | 550      | 20000                                | 360  | 4300  |
| 32D361K     | 230                       | 300         | 360(324~396)                     | 200                      | 595      | 20000                                | 380  | 3900  |
| 32D391K     | 250                       | 320         | 390(351~429)                     | 200                      | 650      | 20000                                | 400  | 3200  |
| 32D431K     | 275                       | 350         | 430(387~473)                     | 200                      | 710      | 20000                                | 430  | 3100  |
| 32D471K     | 300                       | 385         | 470(423~517)                     | 200                      | 775      | 20000                                | 460  | 2800  |
| 32D511K     | 320                       | 415         | 510(459~561)                     | 200                      | 845      | 20000                                | 510  | 2700  |
| 32D561K     | 350                       | 460         | 560(504~616)                     | 200                      | 925      | 20000                                | 540  | 2550  |
| 32D621K     | 385                       | 505         | 620(558~682)                     | 200                      | 1025     | 20000                                | 570  | 2400  |
| 32D681K     | 420                       | 560         | 680(612~748)                     | 200                      | 1120     | 20000                                | 600  | 2200  |
| 32D751K     | 460                       | 615         | 750(675~825)                     | 200                      | 1240     | 20000                                | 620  | 2000  |
| 32D781K     | 485                       | 640         | 780(702~858)                     | 200                      | 1290     | 20000                                | 660  | 1900  |
| 32D821K     | 510                       | 670         | 820(738~902)                     | 200                      | 1355     | 20000                                | 700  | 1800  |
| 32D911K     | 550                       | 745         | 910(819~1001)                    | 200                      | 1500     | 20000                                | 750  | 1300  |
| 32D951K     | 575                       | 765         | 950(855~1045)                    | 200                      | 1570     | 20000                                | 780  | 1200  |
| 32D102K     | 625                       | 825         | 1000(900~1100)                   | 200                      | 1650     | 20000                                | 810  | 1100  |
| 32D112K     | 680                       | 895         | 1100(990~1210)                   | 200                      | 1815     | 20000                                | 910  | 1000  |
| 32D122K     | 750                       | 990         | 1200(1080~1320)                  | 200                      | 1980     | 20000                                | 960  | 920   |
| 32D142K     | 880                       | 1140        | 1400(1260~1540)                  | 200                      | 2310     | 20000                                | 1020                                       | 800   |
| 32D162K     | 1000                      | 1280        | 1600(1440~1760)                  | 200                      | 2640     | 20000                                | 1080                                       | 700   |

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### Current Energy and Power Dissipation Ratings

Should transients occur in rapid succession, the average power dissipation is the energy (watt-seconds) per pulse times the number of pulses per second. The power so developed must be within the specifications shown on the Device Ratings and Specifications Table for the specific device. The operating values of a MOV need to be derated at high temperatures as shown above. Because varistors only dissipate a relatively small amount of average power they are not suitable for repetitive applications that involve substantial amounts of average power dissipation.

Figure 1A - Power Derating for Epoxy Coated

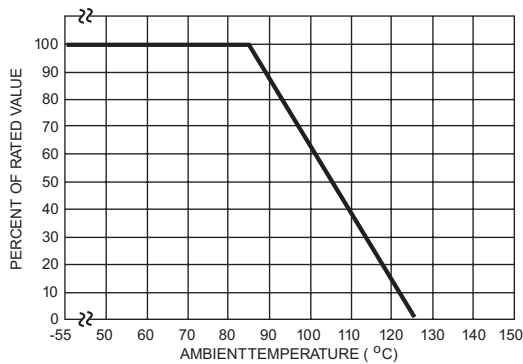
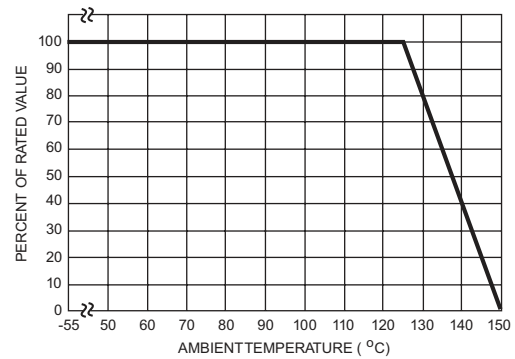
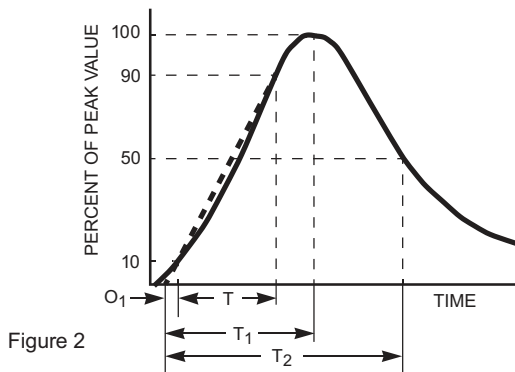


Figure 1B - Power Derating for Pholenic Coated



### Peak Pulse Current Test Waveform



$O_1$  = Virtual Origin of Wave  
 $T$  = Time from 10% to 90% of Peak  
 $T_1$  = Rise Time =  $1.25 \times T$   
 $T_2$  = Decay Time  
 Example - For an  $8/20 \mu s$  Current Waveform:  
 $8 \mu s = T_1 = \text{Rise Time}$   
 $20 \mu s = T_2 = \text{Decay Time}$

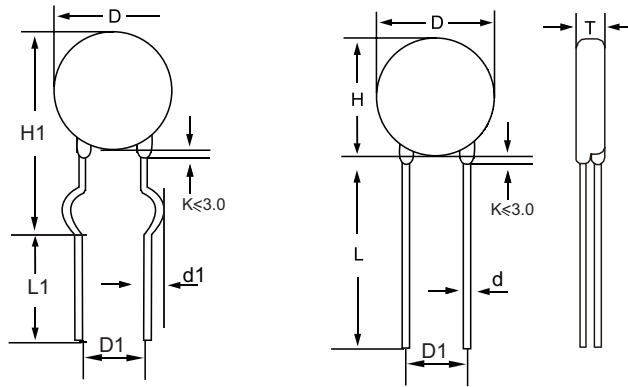
### Packaging

| Part Number | Component Package | Quantity | Packaging Option | Packaging Specification |
|-------------|-------------------|----------|------------------|-------------------------|
| 32D         | 32.0              | 100      | BOX              | 200PCS                  |

## Metal Oxide Varistors - 32D Series

### Package Dimensions

Unit:mm



**TABLE 1**

| Symbol   | Dimensions |
|----------|------------|
| H(max.)  | 60.2       |
| H1(max.) | 16.5       |
| D(max.)  | 45         |
| D1(+1.0) | 25.4       |
| T(max.)  | TABLE 2    |
| d(+0.1)  | 0.5        |
| d1(+0.3) | 3.4        |
| K(max.)  | 3.18       |
| W(+0.5)  | 7.0        |
| Φ(M+0.2) | 3.8        |

**TABLE 2**

| Model | T(max.) | Model | T(max.) |
|-------|---------|-------|---------|
| 201K  | 6.2     | 621K  | 8.7     |
| 221K  | 6.3     | 681K  | 9.0     |
| 241K  | 6.4     | 751K  | 9.4     |
| 271K  | 6.6     | 781K  | 9.6     |
| 301K  | 6.8     | 821K  | 9.8     |
| 331K  | 6.9     | 911K  | 10.4    |
| 361K  | 7.1     | 951K  | 10.6    |
| 391K  | 7.3     | 102K  | 11.2    |
| 431K  | 7.5     | 112K  | 11.8    |
| 471K  | 7.8     | 122K  | 12.3    |
| 511K  | 8.0     | 142K  | 13.3    |
| 561K  | 8.3     | 162K  | 14.3    |

### Warehouse Storage Conditions of Products

- Storage Conditions:
  1. Storage Temperature: -10°C~+40°C
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year

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