



## Features

- Hybrid design
- Low leakage
- Bidirectional protection
- Low capacitance
- UL Type 5 Recognized **us**
- RoHS compliant\*



## GMOV™ Series - 14 & 20 mm Hybrid Protection Component

### General Information

Bourns combines its patented GDT with FLAT® technology and a Metal Oxide Varistor (MOV) to create a new and innovative GMOV™ Series Hybrid Protection Component. By combining the best features of both MOV and GDT technologies, the GMOV™ Series achieves high performance as a long life protector with low capacitance and, most importantly, very low leakage. The GMOV™ Series is ideally suited for any number of AC and DC power applications where a high level of performance is required over time.

### Industry Standard Compliance

|                 |                            |
|-----------------|----------------------------|
| <b>Standard</b> | <b>UL 1449 4th Edition</b> |
| File Number     | E313168                    |

### Environmental Specifications

Moisture Sensitivity Level ..... 1  
ESD Classification (HBM) ..... N/A

### Absolute Maximum Ratings (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Parameter             | Symbol           | Min. | Typ. | Max. | Unit |
|-----------------------|------------------|------|------|------|------|
| Operating Temperature | T <sub>OPR</sub> | -40  | 25   | +85  | °C   |
| Storage Temperature   | T <sub>STG</sub> | -40  | 25   | +105 | °C   |

### Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Bourns Part No. | Operating                                |                 |                     |                  | Protection                       |                  |                               |   |                |                       |         |
|-----------------|--|-----------------|---------------------|------------------|----------------------------------|------------------|-------------------------------|---|----------------|-----------------------|---------|
|                 | Max. Continuous Operating Voltage (MCOV) |                 | Max. Leakage @ MCOV | Max. Capacitance | I <sub>nom</sub><br>UL 1449/4th. | I <sub>max</sub> | Ring Wave Surge<br>IEEE 62.41 | Protection Level Current Class (1)<br>IEC 61051-1 |                | Clamp Transition Time | Energy  |
|                 | V <sub>rms</sub>                         | V <sub>dc</sub> | A <sub>rms</sub>    | 1 MHz            | 15 Ops.                          | 1 Op.            | 200 A                         | Max.  | Typ.           |                       | 8/20 μs |
|                 | V  | V               | μA                  | pF               | A                                | A                | Ops.                          | V <sub>fp</sub>                                   | V <sub>C</sub> | μs                    | J       |
| GMOV-14D450K    | 45                                       | 56              | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 900   | 150            | 0.3                   | 24      |
| GMOV-14D500K    | 50                                       | 65              | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 800   | 150            | 0.3                   | 27      |
| GMOV-14D650K    | 65                                       | 85              | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 800   | 185            | 0.3                   | 33      |
| GMOV-14D950K    | 95                                       | 125             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 800   | 270            | 0.3                   | 53      |
| GMOV-14D111K    | 115                                      | 150             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 800   | 320            | 0.3                   | 60      |
| GMOV-14D131K    | 130                                      | 170             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 800   | 360            | 0.3                   | 70      |
| GMOV-14D141K    | 140                                      | 180             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 950   | 380            | 0.3                   | 78      |
| GMOV-14D151K    | 150                                      | 200             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 950   | 420            | 0.3                   | 84      |
| GMOV-14D171K    | 175                                      | 225             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 950   | 470            | 0.3                   | 99      |
| GMOV-14D231K    | 230                                      | 300             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 1,300   | 620            | 0.3                   | 130     |
| GMOV-14D251K    | 250                                      | 320             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 1,300   | 675            | 0.3                   | 140     |
| GMOV-14D271K    | 275                                      | 350             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 1,300   | 730            | 0.3                   | 155     |
| GMOV-14D301K    | 300                                      | 385             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 1,300   | 800            | 0.3                   | 175     |
| GMOV-14D321K    | 320                                      | 415             | < 1                 | 4                | 3,000                            | 6,000            | ± 250                         | 1,300   | 875            | 0.3                   | 180     |
| GMOV-20D450K    | 45                                       | 56              | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 150            | 0.3                   | 49      |
| GMOV-20D500K    | 50                                       | 65              | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 900   | 150            | 0.3                   | 56      |
| GMOV-20D650K    | 65                                       | 85              | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 900   | 185            | 0.3                   | 70      |
| GMOV-20D950K    | 95                                       | 125             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 900   | 270            | 0.3                   | 106     |
| GMOV-20D111K    | 115                                      | 150             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 320            | 0.3                   | 130     |
| GMOV-20D131K    | 130                                      | 170             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 360            | 0.3                   | 140     |
| GMOV-20D141K    | 140                                      | 180             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 380            | 0.3                   | 155     |
| GMOV-20D151K    | 150                                      | 200             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 420            | 0.3                   | 168     |
| GMOV-20D171K    | 175                                      | 225             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 950   | 470            | 0.3                   | 190     |
| GMOV-20D231K    | 230                                      | 300             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 1,300   | 620            | 0.3                   | 255     |
| GMOV-20D251K    | 250                                      | 320             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 1,300   | 675            | 0.3                   | 275     |
| GMOV-20D271K    | 275                                      | 350             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 1,300   | 730            | 0.3                   | 305     |
| GMOV-20D301K    | 300                                      | 385             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 1,300   | 800            | 0.3                   | 350     |
| GMOV-20D321K    | 320                                      | 415             | < 1                 | 4                | 5,000                            | 10,000           | ± 250                         | 1,300   | 875            | 0.3                   | 360     |

(1) Front Level Protection (V<sub>fp</sub>) defined as measured with 10 % of peak current in accordance with IEC 61051-1.

\*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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## Applications

### AC Line Protection

- White goods
- Power line communications
- Smoke alarm systems
- High value consumer goods
- UL1449 SPD

### DC Line Protection

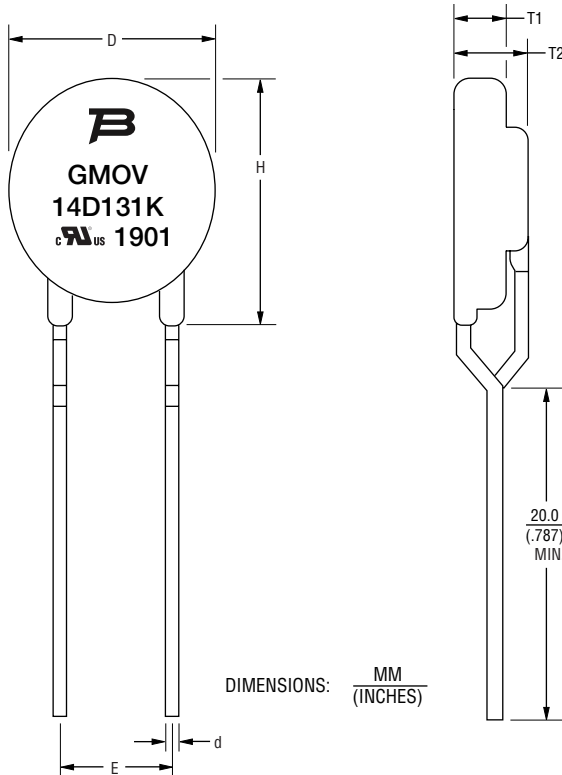
- Solar inverters
- Power supplies
- Distribution systems



## GMOV™ Series - 14 & 20 mm Hybrid Protection Component

**BOURNS®**

### Product Dimensions



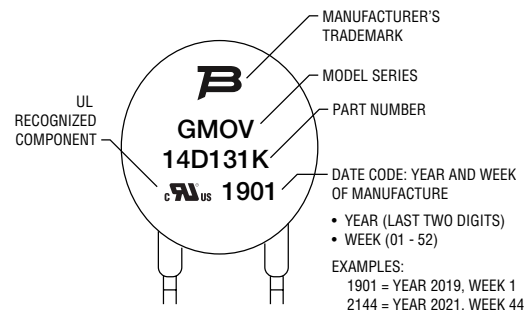
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

| Dimension | GMOV-14DxxxK                          | GMOV-20DxxxK                           |
|-----------|---------------------------------------|--|
| D (Max.)  | $\frac{16.5}{(.649)}$                 | $\frac{23.0}{(.906)}$                  |
| H (Max.)  | $\frac{20.0}{(.787)}$                 | $\frac{26.0}{(1.024)}$                 |
| T1 (Max.) | $\frac{5.0}{(.197)}$                  | $\frac{6.0}{(.236)}$                   |
| T2 (Max.) | $\frac{8.0}{(.315)}$                  | $\frac{9.0}{(.354)}$                   |
| d         | $\frac{0.8 \pm 0.1}{(.031 \pm .004)}$ | $\frac{1.0 \pm 0.1}{(.039 \pm .004)}$  |
| E         | $\frac{7.5 \pm 1.0}{(.295 \pm .039)}$ | $\frac{10.0 \pm 1.0}{(.394 \pm .039)}$ |

### Typical Part Marking

| Bourns Part Number | Bourns Part Marking |
|--------------------|---------------------|
| GMOV-14D450K       | 14D450K             |
| GMOV-14D500K       | 14D500K             |
| GMOV-14D650K       | 14D650K             |
| GMOV-14D950K       | 14D950K             |
| GMOV-14D111K       | 14D111K             |
| GMOV-14D131K       | 14D131K             |
| GMOV-14D141K       | 14D141K             |
| GMOV-14D151K       | 14D151K             |
| GMOV-14D171K       | 14D171K             |
| GMOV-14D231K       | 14D231K             |
| GMOV-14D251K       | 14D251K             |
| GMOV-14D271K       | 14D271K             |
| GMOV-14D301K       | 14D301K             |
| GMOV-14D321K       | 14D321K             |

|              |         |
|--------------|---------|
| GMOV-20D450K | 20D450K |
| GMOV-20D500K | 20D500K |
| GMOV-20D650K | 20D650K |
| GMOV-20D950K | 20D950K |
| GMOV-20D111K | 20D111K |
| GMOV-20D131K | 20D131K |
| GMOV-20D141K | 20D141K |
| GMOV-20D151K | 20D151K |
| GMOV-20D171K | 20D171K |
| GMOV-20D231K | 20D231K |
| GMOV-20D251K | 20D251K |
| GMOV-20D271K | 20D271K |
| GMOV-20D301K | 20D301K |
| GMOV-20D321K | 20D321K |



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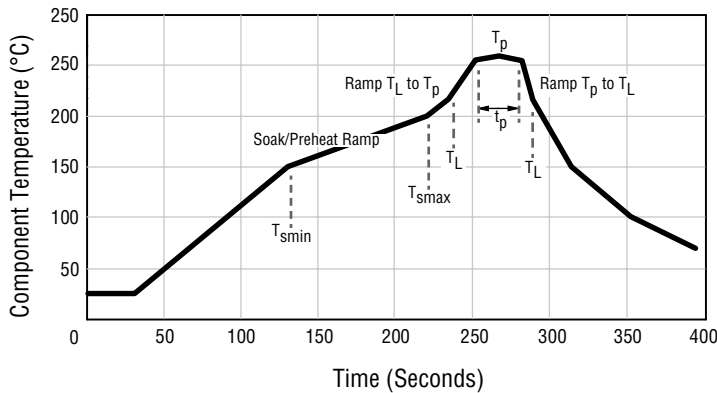
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# GMOV™ Series - 14 & 20 mm Hybrid Protection Component **BOURNS®**

## Solder Profile

Users should ensure that they do not exceed the scope of IPC/JEDEC J-STD-020 (Pb-Free) during solder assembly.

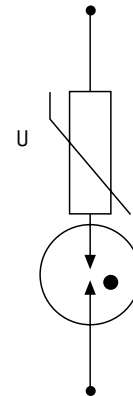


| Profile Feature                                | Profile Limits     |
|--|--------------------|
| Preheat temperature min. ( $T_{smin}$ )        | 150 °C             |
| Preheat temperature max. ( $T_{smax}$ )        | 200 °C             |
| Ramp time ( $T_{smax} - T_{smin}$ )            | 60 – 120 seconds   |
| Ramp-up rate ( $T_L$ to $T_p$ )                | 3 °C / second max. |
| Liquidus temperature ( $T_L$ )                 | 217 °C             |
| Time maintained above $T_L$                    | 60 – 150 seconds   |
| Peak package body temperature                  | 260 °C             |
| Time within 5 °C of peak temperature ( $T_p$ ) | 30 seconds max.    |
| Ramp-down rate ( $T_p$ to $T_L$ )              | 6 °C / second max. |
| Time from 25 °C to peak temperature            | 8 minutes max.     |

## Construction



## Circuit Diagram



## How to Order

- Model Designator \_\_\_\_\_  
GMOV™ = GDT/MOV Hybrid Protection Component
- Disc Diameter \_\_\_\_\_  
14D = 14 mm  
20D = 20 mm
- RMS Voltage \_\_\_\_\_  
See Electrical Characteristics Table
- Multiplier of Voltage Digits \_\_\_\_\_  
0 = No multiplier  
1 = nn times 10<sup>1</sup>
- MOV Disc Voltage Tolerance \_\_\_\_\_  
K = 10 %
- Packaging \_\_\_\_\_  
Blank = Bulk

**GMOV - nnD nn (n) K - \_\_\_\_\_**

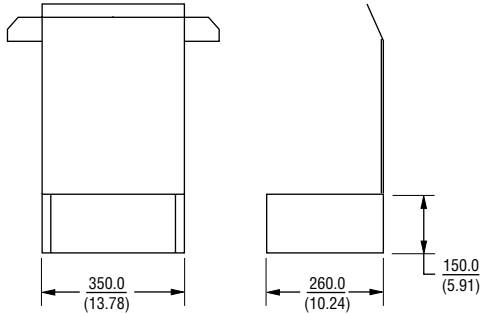
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## GMOV™ Series - 14 & 20 mm Hybrid Protection Component

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### Packaging Information - 14 mm Disc

**BULK**

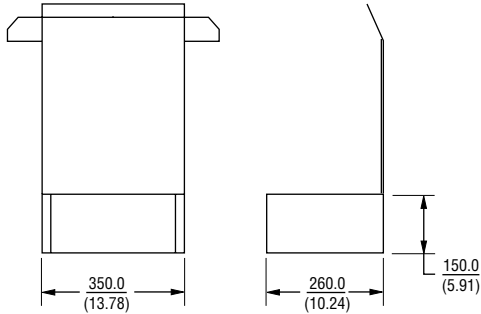


- GMOV-14DxxxK: 1600 pcs. per carton
- 200 pcs. per bag;
  - 2 bags per inner box;
  - 4 inner boxes per carton

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

### Packaging Information - 20 mm Disc

**BULK**



- GMOV-20DxxxK: 1000 pcs. per carton
- 250 pcs. per bag;
  - 1 bag per inner box;
  - 4 inner boxes per carton

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

**BOURNS®**

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