



## SPECIFICATIONS

PRODUCT : VARISTOR

TYPE : GNR10D□□□K

MODEL :

CITATION :

REVISION : B01

TOTAL PAGES : 5 PAGE : 1/5

RELEASED DATE : Oct. 13, 2001

## REVISION HISTORY

| NO | REV. DATE     | DCR NO. | DESCRIPTION OF CHANGE | REV. |
|----|---------------|---------|-----------------------|------|
| 1  | Oct. 13, 2001 |         | NEW RELEASE           | B01  |
| 2  |               |         |                       |      |
| 3  |               |         |                       |      |
| 4  |               |         |                       |      |
| 5  |               |         |                       |      |
| 6  |               |         |                       |      |
| 7  |               |         |                       |      |
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| 9  |               |         |                       |      |
| 10 |               |         |                       |      |
| 11 |               |         |                       |      |
| 12 |               |         |                       |      |

| Approved by    | Checked by | Edited by   |
|----------------|------------|-------------|
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|                 |                                       |                   |       |      |                      |     |
|-----------------|---------------------------------------|-------------------|-------|------|----------------------|-----|
| <b>CERAMATE</b> | TYPE                                  | <b>GNR10D□□□K</b> | MODEL |      | PAGE                 | 2/5 |
| CITATION        |                                       |                   |       | DATE | <b>Oct. 13, 2001</b> |     |
| SUBJECT         | <b>QUALITY APPROVAL and STRUCTURE</b> |                   |       | REV. | <b>B01</b>           |     |

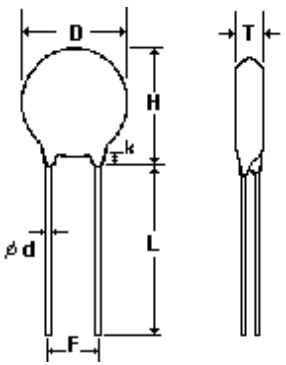
### 1. QUALITY SYSTEM APPROVAL

ISO9001 Certificate of approval No.97-HOU-AQ-1382

### 2. SAFETY STANDARDS APPROVAL

| Standard No. | UL 1414  | UL 1449  | UL 497B  | CUL      | CSA C22.2 No.1 | VDE 42000 |
|--------------|----------|----------|----------|----------|----------------|-----------|
| File No.     | E181368  | E166389  | E187844  | E166389  | LR105317       | 5938      |
| 180K~680K    |          |          | Approved |          |                | Approved  |
| 820K~181K    |          | Approved | Approved | Approved |                | Approved  |
| 201K~471K    | Approved | Approved | Approved | Approved | Approved       | Approved  |
| 511K         |          | Approved | Approved | Approved |                | Approved  |
| 561K~821K    | Approved | Approved | Approved | Approved |                | Approved  |
| 911K~182K    |          |          |          |          |                | Approved  |

### 3. STRUCTURE

| NO. | ITEM             | DESCRIPTION   |          |             |
|-----|------------------|---|----------|-------------|
| 3.1 | Main Material    | Zinc Oxide  |          |             |
| 3.2 | Coating Material | Epoxy Resin   |          |             |
| 3.3 | Marking          | GNR, Part number, UL, CSA(or CUL) and VDE recognized component mark, Date code      |          |             |
| 3.4 | Appearance       | Without dirt and crack, marking should be clear                                     |          |             |
| 3.5 | Dimensions       |  | D(max.)  | 12.5        |
|     |                  |   | H(max.)  | 16.5        |
|     |                  |   | T(max.)  | <b>*(1)</b> |
|     |                  |   | F        | 7.5± 1.0    |
|     |                  |   | φ d      | 0.8± 0.1    |
|     |                  |   | L(min.)  | 25.0        |
|     |                  |   | k(max.)  | 3.0         |
|     |                  |   | Unit: mm |             |

**\*(1) See Page 3, Dimensions Table**

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**DIMENSIONS TABLE**

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| <b>Part No.</b> | <b>T<sub>max.</sub></b> |
|-----------------|-------------------------|
| <b>10D180K</b>  | 3.8                     |
| <b>10D220K</b>  | 4.0                     |
| <b>10D270K</b>  | 4.3                     |
| <b>10D330K</b>  | 3.6                     |
| <b>10D390K</b>  | 3.8                     |
| <b>10D470K</b>  | 4.0                     |
| <b>10D560K</b>  | 4.2                     |
| <b>10D680K</b>  | 4.0                     |
| <b>10D820K</b>  | 3.6                     |
| <b>10D101K</b>  | 3.8                     |
| <b>10D121K</b>  | 4.0                     |
| <b>10D151K</b>  | 4.3                     |
| <b>10D181K</b>  | 3.7                     |
| <b>10D201K</b>  | 3.8                     |
| <b>10D221K</b>  | 3.9                     |
| <b>10D241K</b>  | 4.0                     |
| <b>10D271K</b>  | 4.1                     |
| <b>10D301K</b>  | 4.3                     |
| <b>10D331K</b>  | 4.4                     |
| <b>10D361K</b>  | 4.6                     |
| <b>10D391K</b>  | 4.7                     |
| <b>10D431K</b>  | 4.9                     |
| <b>10D471K</b>  | 5.1                     |
| <b>10D511K</b>  | 5.2                     |
| <b>10D561K</b>  | 5.3                     |
| <b>10D621K</b>  | 5.6                     |
| <b>10D681K</b>  | 5.9                     |
| <b>10D751K</b>  | 6.2                     |
| <b>10D781K</b>  | 6.3                     |
| <b>10D821K</b>  | 6.5                     |
| <b>10D911K</b>  | 6.6                     |
| <b>10D102K</b>  | 6.8                     |
| <b>10D112K</b>  | 7.2                     |
| <b>10D182K</b>  | 11.2                    |

**Unit:mm**

|                 |                                   |                            |       |      |                      |     |
|-----------------|-----------------------------------|----------------------------|-------|------|----------------------|-----|
| <b>CERAMATE</b> | TYPE                              | <b>GNR10D</b> □□□ <b>K</b> | MODEL |      | PAGE                 | 4/5 |
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| SUBJECT         | <b>ELECTRICAL CHARACTERISTICS</b> |                            |       | REV. | <b>B01</b>           |     |

#### 4. ELECTRICAL CHARACTERISTICS

| NO. | ITEM                                     | PERFORMANCE   | TEST METHODS  |
|-----|--|---|---|
| 4.0 | Standard Conditions                      |   | Unless otherwise specified, all tests are made under environmental conditions as given below:<br>Temperature: 5~35°C<br>Relative humidity: 45~85 % RH                       |
| 4.1 | Maximum Allowable Voltage                | AC : <b>*(2)</b> V <sub>rms</sub><br>DC : <b>*(2)</b> V | Maximum continuous sine wave(RMS) or DC voltage which may be applied.   |
| 4.2 | Varistor Voltage                         | V <sub>1mA</sub> : <b>*(2)</b> V                        | Voltage across the varistor measured at C <sub>mA</sub> DC.   |
| 4.3 | Varistor Voltage Temperature Coefficient | 0 ~ -0.05 %/°C  | $\frac{V_{CmA \text{ at } 85^{\circ}\text{C}} - V_{CmA \text{ at } 25^{\circ}\text{C}}}{V_{CmA \text{ at } 25^{\circ}\text{C}}} \times \frac{1}{60} \times 100$             |
| 4.4 | Max. Clamping Voltage                    | <b>*(2)</b> V at <b>*(2)</b> A                          | Peak voltage across the varistor with a specified peak impulse current of 8x 20 μs waveform.  |
| 4.5 | Rated Power                              | <b>*(2)</b> W   | Maximum 50~60Hz power which may be loaded for 1,000 hrs at 85± 2°C with $\Delta V_{CmA} / V_{CmA} \leq \pm 10\%$ .  |
| 4.6 | Withstanding Surge Current               | <b>*(2)</b> A   | The max. current within the varistor voltage change of less than ± 10% when one impulse current (8x 20 μs) applied.   |
|     |  |   | The max. current with a varistor voltage change of less than ± 10% when two times impulse current (8x 20 μs) are applied at intervals of 5 minutes.                         |
| 4.7 | Energy                                   | <b>*(2)</b> Joule                                       | The max. energy absorbed with a varistor voltage change of less than ± 10% when one impulse(10 x 1000 μs) is applied.   |
| 4.8 | Surge Life                               | <b>*(2)</b> A   | The max. current with a varistor voltage change of less than ± 10% when 10,000 times impulse current (8x 20 μs) are applied at intervals of 20 seconds at room temperature. |

\* (2) See Page 5

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**ELECTRICAL CHARACTERISTICS**

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| PART<br>NUMBER | MAXIMUM<br>ALLOWABLE<br>VOLTAGE |       | VARISTOR<br>VOLTAGE | CLAMPING<br>VOLTAGE<br>(MAX.) |       | RATED<br>WATTAGE<br>(MAX.) | SURGE<br>CURRENT<br>(8/20 $\mu$ s) |         | MAXIMUM<br>ENERGY<br>(10/1000 $\mu$ s) | SURGE<br>LIFE |
|----------------|---------------------------------|-------|---------------------|-------------------------------|-------|----------------------------|------------------------------------|---------|--|---------------|
|                | AC <sub>rms</sub> (V)           | DC(V) | (V)                 | (V)                           | Ip(A) | (W)                        | I <sub>tm</sub> (A)                |         | W <sub>tm</sub> (joule)                | (A)           |
|                |                                 |       |                     |                               |       |                            | 1 TIME                             | 2 TIMES |  |               |
| <b>10D180K</b> | 11                              | 14    | 16~20               | 36                            | 5     | 0.05                       | 1000                               | 500     | 2.6                                    | 50            |
| <b>10D220K</b> | 14                              | 18    | 20~24               | 43                            |       |                            |                                    |         | 3.2                                    |               |
| <b>10D270K</b> | 17                              | 22    | 24~30               | 53                            |       |                            |                                    |         | 3.9                                    |               |
| <b>10D330K</b> | 20                              | 26    | 30~36               | 65                            |       |                            |                                    |         | 4.8                                    |               |
| <b>10D390K</b> | 25                              | 31    | 35~43               | 77                            |       |                            |                                    |         | 5.6                                    |               |
| <b>10D470K</b> | 30                              | 38    | 42~52               | 93                            |       |                            |                                    |         | 6.8                                    |               |
| <b>10D560K</b> | 35                              | 45    | 50~62               | 110                           |       |                            |                                    |         | 8.1                                    |               |
| <b>10D680K</b> | 40                              | 56    | 61~75               | 135                           |       |                            |                                    |         | 9.8                                    |               |
| <b>10D820K</b> | 50                              | 65    | 74~90               | 135                           | 25    | 0.4                        | 3500                               | 2500    | 14                                     | 150           |
| <b>10D101K</b> | 60                              | 85    | 90~110              | 165                           |       |                            |                                    |         | 17                                     |               |
| <b>10D121K</b> | 75                              | 100   | 108~132             | 200                           |       |                            |                                    |         | 20                                     |               |
| <b>10D151K</b> | 95                              | 125   | 135~165             | 250                           |       |                            |                                    |         | 25                                     |               |
| <b>10D181K</b> | 115                             | 150   | 162~198             | 300                           |       |                            |                                    |         | 32                                     |               |
| <b>10D201K</b> | 130                             | 170   | 185~225             | 340                           |       |                            |                                    |         | 35                                     |               |
| <b>10D221K</b> | 140                             | 180   | 198~242             | 360                           |       |                            |                                    |         | 39                                     |               |
| <b>10D241K</b> | 150                             | 200   | 216~264             | 395                           |       |                            |                                    |         | 42                                     |               |
| <b>10D271K</b> | 175                             | 225   | 247~303             | 455                           |       |                            |                                    |         | 49                                     |               |
| <b>10D301K</b> | 190                             | 250   | 270~330             | 505                           |       |                            |                                    |         | 54                                     |               |
| <b>10D331K</b> | 210                             | 275   | 297~363             | 545                           |       |                            |                                    |         | 58                                     |               |
| <b>10D361K</b> | 230                             | 300   | 324~396             | 595                           |       |                            |                                    |         | 65                                     |               |
| <b>10D391K</b> | 250                             | 320   | 351~429             | 650                           |       |                            |                                    |         | 70                                     |               |
| <b>10D431K</b> | 275                             | 350   | 387~473             | 710                           |       |                            |                                    |         | 80                                     |               |
| <b>10D471K</b> | 300                             | 385   | 423~517             | 775                           |       |                            |                                    |         | 85                                     |               |
| <b>10D511K</b> | 320                             | 410   | 459~561             | 845                           |       |                            |                                    |         | 92                                     |               |
| <b>10D561K</b> | 350                             | 460   | 504~616             | 920                           |       |                            |                                    |         | 92                                     |               |
| <b>10D621K</b> | 385                             | 505   | 558~682             | 1025                          |       |                            |                                    |         | 92                                     |               |
| <b>10D681K</b> | 420                             | 560   | 612~748             | 1120                          |       |                            |                                    |         | 92                                     |               |
| <b>10D751K</b> | 460                             | 615   | 675~825             | 1240                          |       |                            |                                    |         | 100                                    |               |
| <b>10D781K</b> | 485                             | 640   | 702~858             | 1290                          | 105   |                            |                                    |         |  |               |
| <b>10D821K</b> | 510                             | 670   | 738~902             | 1355                          | 110   |                            |                                    |         |  |               |
| <b>10D911K</b> | 550                             | 745   | 819~1001            | 1500                          | 130   |                            |                                    |         |  |               |
| <b>10D102K</b> | 625                             | 825   | 900~1100            | 1650                          | 140   |                            |                                    |         |  |               |
| <b>10D112K</b> | 680                             | 895   | 990~1210            | 1815                          | 155   |                            |                                    |         |  |               |
| <b>10D182K</b> | 1000                            | 1465  | 1700~1980           | 2970                          | 247   | 120                        |                                    |         |  |               |