

## SPECIFICATIONS

PRODUCT : **VARISTOR**

TYPE : **GNR20D□□□K**

MODEL :

CITATION :

REVISION : **B01**

TOTAL PAGES : **5**

PAGE : **1/5**

RELEASED DATE : **Oct. 05, 2001**

### REVISION HISTORY

| NO | REV. DATE     | DCR NO. | DESCRIPTION OF CHANGE | REV.       |
|----|---------------|---------|-----------------------|------------|
| 1  | Oct. 05, 2001 |         | NEW RELEASE           | <b>B01</b> |
| 2  |               |         |                       |            |
| 3  |               |         |                       |            |
| 4  |               |         |                       |            |
| 5  |               |         |                       |            |
| 6  |               |         |                       |            |
| 7  |               |         |                       |            |
| 8  |               |         |                       |            |
| 9  |               |         |                       |            |
| 10 |               |         |                       |            |
| 11 |               |         |                       |            |
| 12 |               |         |                       |            |

| Approved by    | Checked by | Edited by   |
|----------------|------------|-------------|
| Yu-Chang Huang | Cloud Chen | Andy Chiang |

|                 |                                       |                   |       |      |                      |     |
|-----------------|---------------------------------------|-------------------|-------|------|----------------------|-----|
| <b>CERAMATE</b> | TYPE                                  | <b>GNR20D□□□K</b> | MODEL |      | PAGE                 | 2/5 |
| CITATION        |                                       |                   |       | DATE | <b>Oct. 05, 2001</b> |     |
| SUBJECT         | <b>QUALITY APPROVAL and STRUCTURE</b> |                   |       | REV. | <b>B01</b>           |     |

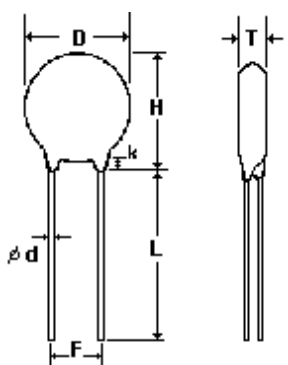
## 1. QUALITY SYSTEM APPROVAL

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~112K    |          |          |          |          |                | Approved  |
| 182K         |          |          |          |          |                |           |

## 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.)  | 23.0        |
|     |                  |   | H(max.)  | 26.5        |
|     |                  |   | T(max.)  | <b>*(1)</b> |
|     |                  |   | F        | 10.0± 1.0   |
|     |                  |   | φ d      | 1.0± 0.1    |
|     |                  |   | L(min.)  | 25.0        |
|     |                  |   | k(max.)  | 3.0         |
|     |                  |   | Unit: mm |             |

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

|                 |                         |                   |       |      |                      |     |
|-----------------|-------------------------|-------------------|-------|------|----------------------|-----|
| <b>CERAMATE</b> | TYPE                    | <b>GNR20D□□□K</b> | MODEL |      | PAGE                 | 3/5 |
| CITATION        |                         |                   |       | DATE | <b>Oct. 05, 2001</b> |     |
| SUBJECT         | <b>DIMENSIONS TABLE</b> |                   |       | REV. | <b>B01</b>           |     |

| Part No.       | T <sub>max.</sub> |
|----------------|-------------------|
| <b>20D180K</b> | 4.3               |
| <b>20D220K</b> | 4.5               |
| <b>20D270K</b> | 4.8               |
| <b>20D330K</b> | 4.1               |
| <b>20D390K</b> | 4.3               |
| <b>20D470K</b> | 4.5               |
| <b>20D560K</b> | 4.7               |
| <b>20D680K</b> | 4.5               |
| <b>20D820K</b> | 4.1               |
| <b>20D101K</b> | 4.3               |
| <b>20D121K</b> | 4.5               |
| <b>20D151K</b> | 4.8               |
| <b>20D181K</b> | 4.2               |
| <b>20D201K</b> | 4.3               |
| <b>20D221K</b> | 4.4               |
| <b>20D241K</b> | 4.5               |
| <b>20D271K</b> | 4.6               |
| <b>20D301K</b> | 4.8               |
| <b>20D331K</b> | 4.9               |
| <b>20D361K</b> | 5.1               |
| <b>20D391K</b> | 5.2               |
| <b>20D431K</b> | 5.4               |
| <b>20D471K</b> | 5.6               |
| <b>20D511K</b> | 5.7               |
| <b>20D561K</b> | 5.8               |
| <b>20D621K</b> | 6.1               |
| <b>20D681K</b> | 6.4               |
| <b>20D751K</b> | 6.7               |
| <b>20D781K</b> | 6.8               |
| <b>20D821K</b> | 7.0               |
| <b>20D911K</b> | 7.1               |
| <b>20D102K</b> | 7.3               |
| <b>20D112K</b> | 7.7               |
| <b>20D182K</b> | 11.7              |


**Unit:mm**

|                 |                                   |                            |       |      |                      |     |
|-----------------|-----------------------------------|----------------------------|-------|------|----------------------|-----|
| <b>CERAMATE</b> | TYPE                              | <b>GNR20D</b> □□□ <b>K</b> | MODEL |      | PAGE                 | 4/5 |
| CITATION        |                                   |                            |       | DATE | <b>Oct. 05, 2001</b> |     |
| SUBJECT         | <b>ELECTRICAL CHARACTERISTICS</b> |                            |       | REV. | <b>B01</b>           |     |

#### 4. ELECTRICAL CHARACTERISTICS

| N0. | 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℃<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 %/℃   | $\frac{V_{CmA} \text{ at } 85^{\circ}\text{C} - V_{CmA} \text{ at } 25^{\circ}\text{C}}{V_{CmA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{60} \times 100$             |
| 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 8× 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℃ 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 (8× 20 μs) applied.   |
|     |  |   | The max. current with a varistor voltage change of less than ± 10% when two times impulse current (8× 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 × 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 (8× 20 μs) are applied at intervals of 20 seconds at room temperature. |

**\* (2) See Page 5**

|   |                            |            |       |      |               |     |
|---|----------------------------|------------|-------|------|---------------|-----|
|  CERAMATE | TYPE                       | GNR20D□□□K | MODEL |      | PAGE          | 5/5 |
| CITATION  |                            |            |       | DATE | Oct. 05, 2001 |     |
| SUBJECT   | ELECTRICAL CHARACTERISTICS |            |       | REV. | B01           |     |

| 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 |  |               |
| 20D180K        | 11                              | 14    | 16~20               | 36                            | 20     | 0.2                        | 3000                               | 2000    | 13.0                                   | 130           |
| 20D220K        | 14                              | 18    | 20~24               | 43                            |        |                            |                                    |         | 16.0                                   |               |
| 20D270K        | 17                              | 22    | 24~30               | 53                            |        |                            |                                    |         | 19.0                                   |               |
| 20D330K        | 20                              | 26    | 30~36               | 65                            |        |                            |                                    |         | 24.0                                   |               |
| 20D390K        | 25                              | 31    | 35~43               | 77                            |        |                            |                                    |         | 28.0                                   |               |
| 20D470K        | 30                              | 38    | 42~52               | 93                            |        |                            |                                    |         | 34.0                                   |               |
| 20D560K        | 35                              | 45    | 50~62               | 110                           |        |                            |                                    |         | 41.0                                   |               |
| 20D680K        | 40                              | 56    | 61~75               | 135                           |        |                            |                                    |         | 49.0                                   |               |
| 20D820K        | 50                              | 65    | 74~90               | 135                           |        |                            |                                    |         | 100                                    |               |
| 20D101K        | 60                              | 85    | 90~110              | 165                           | 70.0   |                            |                                    |         |  |               |
| 20D121K        | 75                              | 100   | 108~132             | 200                           | 85.0   |                            |                                    |         |  |               |
| 20D151K        | 95                              | 125   | 135~165             | 250                           | 106.0  |                            |                                    |         |  |               |
| 20D181K        | 115                             | 150   | 162~198             | 300                           | 130.0  |                            |                                    |         |  |               |
| 20D201K        | 130                             | 170   | 185~225             | 340                           | 140.0  |                            |                                    |         |  |               |
| 20D221K        | 140                             | 180   | 198~242             | 360                           | 155.0  |                            |                                    |         |  |               |
| 20D241K        | 150                             | 200   | 216~264             | 395                           | 168.0  |                            |                                    |         |  |               |
| 20D271K        | 175                             | 225   | 247~303             | 455                           | 190.0  |                            |                                    |         |  |               |
| 20D301K        | 190                             | 250   | 270~330             | 505                           | 210.0  |                            |                                    |         |  |               |
| 20D331K        | 210                             | 275   | 297~363             | 545                           | 228.0  |                            |                                    |         |  |               |
| 20D361K        | 230                             | 300   | 324~396             | 595                           | 255.0  |                            |                                    |         |  |               |
| 20D391K        | 250                             | 320   | 351~429             | 650                           | 275.0  |                            |                                    |         |  |               |
| 20D431K        | 275                             | 350   | 387~473             | 710                           | 303.0  |                            |                                    |         |  |               |
| 20D471K        | 300                             | 385   | 423~517             | 775                           | 350.0  |                            |                                    |         |  |               |
| 20D511K        | 320                             | 410   | 459~561             | 845                           | 382.0  |                            |                                    |         |  |               |
| 20D561K        | 350                             | 460   | 504~616             | 920                           | 382.0  |                            |                                    |         |  |               |
| 20D621K        | 385                             | 505   | 558~682             | 1025                          | 382.0  |                            |                                    |         |  |               |
| 20D681K        | 420                             | 560   | 612~748             | 1120                          | 382.0  |                            |                                    |         |  |               |
| 20D751K        | 460                             | 615   | 675~825             | 1240                          | 420.0  |                            |                                    |         |  |               |
| 20D781K        | 485                             | 640   | 702~858             | 1290                          | 440.0  |                            |                                    |         |  |               |
| 20D821K        | 510                             | 670   | 738~902             | 1355                          | 460.0  |                            |                                    |         |  |               |
| 20D911K        | 550                             | 745   | 819~1001            | 1500                          | 510.0  |                            |                                    |         |  |               |
| 20D102K        | 625                             | 825   | 900~1100            | 1650                          | 565.0  |                            |                                    |         |  |               |
| 20D112K        | 680                             | 895   | 990~1210            | 1815                          | 620.0  |                            |                                    |         |  |               |
| 20D182K        | 1000                            | 1465  | 1700~1980           | 2970                          | 1020.0 | 200                        |                                    |         |  |               |