

## VDR-3225 SMT Disc Varistors

### FEATURES

- Improved component design in a compact case
- High surge current capability
- Superior performance at high temperature
- SMD mountable disk varistors, suitable for lead-free reflow / wave soldering

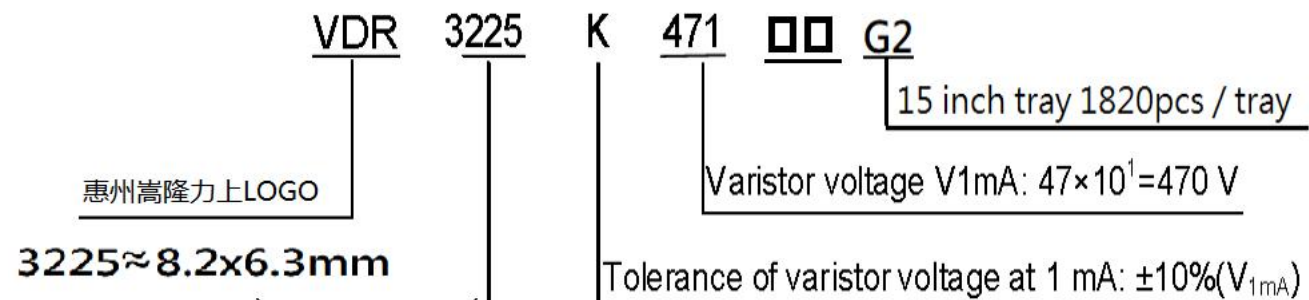
### APPLICATIONS

- Power supplies for telecommunication systems
- Protection for LED circuits
- Protection for consumer, industrial equipment
- Protection for automotive electronics

### APPLICABLE STANDARDS

- UL1449 TYPE5 E525940
- TUV B115439 001 IEC61051-1, -2, -2-2, IEC60950-1Annex Q IEC 62368-1:2018/G.8.1
- IEC61000-4-5
- GB/T10193-1997 GB/T10194-1997/GB8898 GB4943.1 CQCNO:22001333055

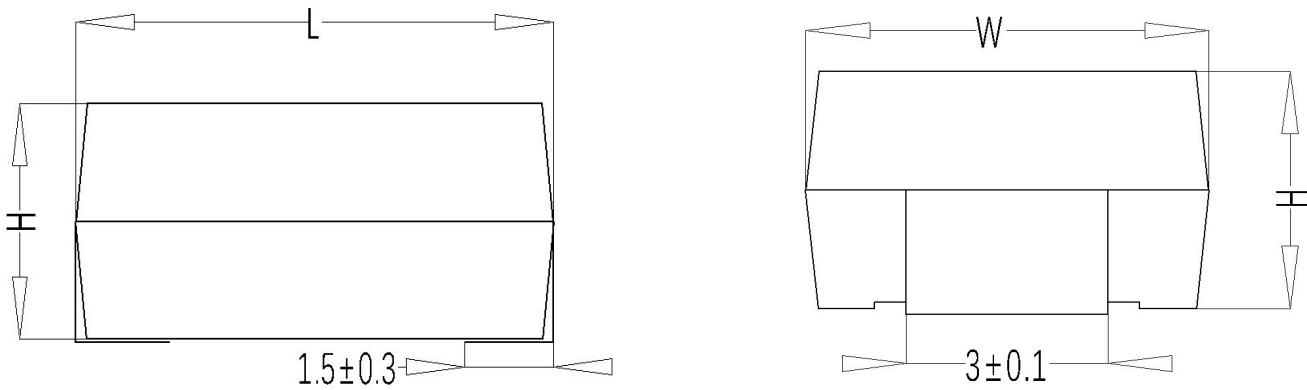
### TYPE CODE DESIGNATION



### General parameters

| Parameter name        | Parameter value | UNIT              |
|-----------------------|-----------------|-------------------|
| working temperature   | -55 — +125      | °C                |
| Storage temperature   | -55 — +125      | °C                |
| Withstand voltage     | ≥2.5            | KV <sub>RMS</sub> |
| Insulation resistance | ≥100            | MΩ                |

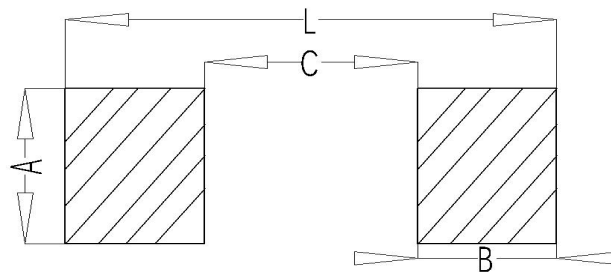
### Structure and size



(UNIT:mm)

| size | Varistor voltage range (V) | L       | W       | H       |
|------|----------------------------|---------|---------|---------|
| 3225 | V <sub>1ma</sub> =201—681  | 8.2±0.3 | 6.3±0.3 | 4.3±0.3 |
|      | V <sub>1ma</sub> =751—821  |         |         | 5.2±0.3 |

### Welding size



(UNIT:mm)

| SIZE | A   | B   | C   | L    |
|------|-----|-----|-----|------|
| 3225 | 3.5 | 2.8 | 4.5 | 10.1 |

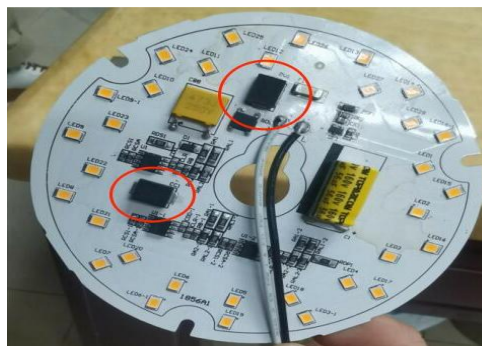
**Electrical characteristics (Standard)**

| Model    | Varistor voltage (@1mA DC) | Maximum Clamping Voltage |                     | Maximum Allowable Voltage (8/20 $\mu$ s) |                    | Max Surge 8/20 $\mu$ s | Energy (10/1000 $\mu$ s) | Rated Powe | Typical Capacitance (Reference) @1KHZ |
|----------|----------------------------|--------------------------|---------------------|--|--------------------|------------------------|--------------------------|------------|---------------------------------------|
|          | V <sub>1mA</sub> (V)       | V <sub>AC</sub> (V)      | V <sub>DC</sub> (V) | V <sub>p</sub> (V)                       | I <sub>p</sub> (A) | I max (A)              | W max (J)                | P (W)      | C(pF)                                 |
| 3225K201 | 200(180-220)               | 130                      | 170                 | 340                                      | 10                 | 1200                   | 15.0                     | 0.25       | 200                                   |
| 3225K221 | 220(198-242)               | 140                      | 180                 | 360                                      | 10                 | 1200                   | 18.0                     | 0.25       | 180                                   |
| 3225K241 | 240(216-264)               | 150                      | 200                 | 395                                      | 10                 | 1200                   | 18.5                     | 0.25       | 170                                   |
| 3225K271 | 270(243-297)               | 175                      | 225                 | 455                                      | 10                 | 1200                   | 21.0                     | 0.25       | 150                                   |
| 3225K361 | 360(324-396)               | 230                      | 300                 | 595                                      | 10                 | 1200                   | 23.0                     | 0.25       | 115                                   |
| 3225K391 | 390(351-429)               | 250                      | 320                 | 650                                      | 10                 | 1200                   | 25.0                     | 0.25       | 105                                   |
| 3225K431 | 430(387-473)               | 275                      | 350                 | 710                                      | 10                 | 1200                   | 29.0                     | 0.25       | 95                                    |
| 3225K471 | 470(423-517)               | 300                      | 385                 | 775                                      | 10                 | 1200                   | 30.0                     | 0.25       | 90                                    |
| 3225K511 | 510(459-561)               | 320                      | 410                 | 845                                      | 10                 | 1200                   | 33.0                     | 0.25       | 85                                    |
| 3225K561 | 560(504-616)               | 350                      | 450                 | 930                                      | 10                 | 1200                   | 33.0                     | 0.25       | 80                                    |
| 3225K621 | 620(558-682)               | 395                      | 510                 | 1020                                     | 10                 | 1200                   | 35.0                     | 0.25       | 78                                    |
| 3225K681 | 680(612-748)               | 420                      | 560                 | 1120                                     | 10                 | 1200                   | 35.0                     | 0.25       | 75                                    |
| 3225K751 | 750(675-825)               | 460                      | 615                 | 1235                                     | 10                 | 1200                   | 50.0                     | 0.25       | 70                                    |
| 3225K781 | 780(702-858)               | 485                      | 640                 | 1290                                     | 10                 | 1200                   | 51.0                     | 0.25       | 65                                    |
| 3225K821 | 820(738-902)               | 510                      | 670                 | 1355                                     | 10                 | 1200                   | 52.0                     | 0.25       | 60                                    |



**Electrical characteristics (High energy)**

| Model      | Varistor voltage (@1mA DC) | Maximum Clamping Voltage |                     | Maximum Allowable Voltage (8/20 $\mu$ s) |                    | Max Surge 8/20 $\mu$ s | Energy (10/1000 $\mu$ s) | Rated Power | Typical Capacitance (Reference) @1KHZ |
|------------|----------------------------|--------------------------|---------------------|--|--------------------|------------------------|--------------------------|-------------|---------------------------------------|
|            | V <sub>1mA</sub> (V)       | V <sub>AC</sub> (V)      | V <sub>DC</sub> (V) | V <sub>p</sub> (V)                       | I <sub>p</sub> (A) | I max (A)              | W max (J)                | P (W)       | C(pF)                                 |
| 3225K201-H | 200(180-220)               | 130                      | 170                 | 340                                      | 10                 | 1750                   | 17                       | 0.25        | 200                                   |
| 3225K221-H | 220(198-242)               | 140                      | 180                 | 360                                      | 10                 | 1750                   | 19                       | 0.25        | 180                                   |
| 3225K241-H | 240(216-264)               | 150                      | 200                 | 395                                      | 10                 | 1750                   | 21                       | 0.25        | 170                                   |
| 3225K271-H | 270(243-297)               | 175                      | 225                 | 455                                      | 10                 | 1750                   | 24                       | 0.25        | 150                                   |
| 3225K361-H | 360(324-396)               | 230                      | 300                 | 595                                      | 10                 | 1750                   | 26                       | 0.25        | 115                                   |
| 3225K391-H | 390(351-429)               | 250                      | 320                 | 650                                      | 10                 | 1750                   | 28                       | 0.25        | 105                                   |
| 3225K431-H | 430(387-473)               | 275                      | 350                 | 710                                      | 10                 | 1750                   | 32                       | 0.25        | 95                                    |
| 3225K471-H | 470(423-517)               | 300                      | 385                 | 775                                      | 10                 | 1750                   | 35                       | 0.25        | 90                                    |
| 3225K511-H | 510(459-561)               | 320                      | 410                 | 845                                      | 10                 | 1750                   | 40                       | 0.25        | 85                                    |
| 3225K561-H | 560(504-616)               | 350                      | 450                 | 930                                      | 10                 | 1750                   | 42                       | 0.25        | 80                                    |
| 3225K621-H | 620(558-682)               | 395                      | 510                 | 1020                                     | 10                 | 1750                   | 45                       | 0.25        | 78                                    |
| 3225K681-H | 680(612-748)               | 420                      | 560                 | 1120                                     | 10                 | 1750                   | 49                       | 0.25        | 75                                    |
| 3225K751-H | 750(675-825)               | 460                      | 615                 | 1235                                     | 10                 | 1750                   | 55                       | 0.25        | 70                                    |
| 3225K781-H | 780(702-858)               | 485                      | 640                 | 1290                                     | 10                 | 1750                   | 60                       | 0.25        | 65                                    |
| 3225K821-H | 820(738-902)               | 510                      | 670                 | 1355                                     | 10                 | 1750                   | 67                       | 0.25        | 60                                    |



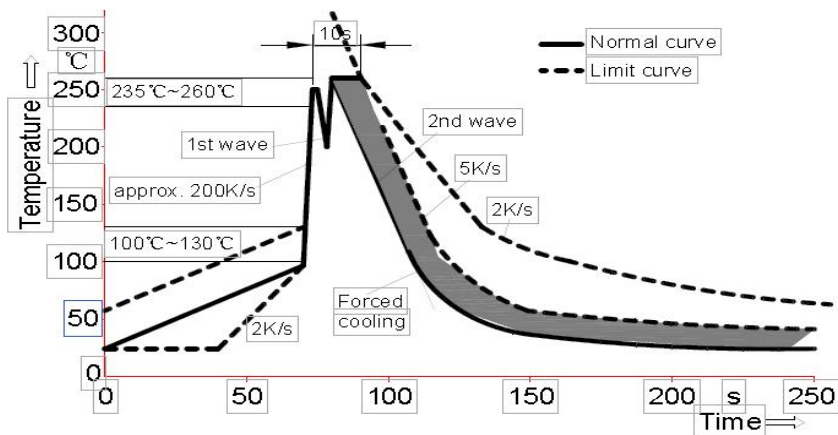
**Electrical characteristics (Combined wave)**

| Model       | Varistor voltage (@1mA DC) | Maximum Clamping Voltage |                     | Maximum Allowable Voltage (8/20μs) |                    | Surge 2KV/1KA 1.2/50+8/20 μs (times) | Energy (10/1000μs) | Rated Powe | Typical Capacitance (Reference) @1KHZ |
|-------------|----------------------------|--------------------------|---------------------|------------------------------------|--------------------|--------------------------------------|--------------------|------------|---------------------------------------|
|             | V <sub>1mA</sub> (V)       | V <sub>AC</sub> (V)      | V <sub>DC</sub> (V) | V <sub>p</sub> (V)                 | I <sub>p</sub> (A) | I max1750A 8/2μs(1time)              | W max (J)          | P (W)      | C(pF)                                 |
| 3225K201-BC | 200(180-220)               | 130                      | 170                 | 340                                | 10                 | 40                                   | 17.0               | 0.25       | 200                                   |
| 3225K221-BC | 220(198-242)               | 140                      | 180                 | 360                                | 10                 | 40                                   | 19.0               | 0.25       | 180                                   |
| 3225K241-BC | 240(216-264)               | 150                      | 200                 | 395                                | 10                 | 40                                   | 21.0               | 0.25       | 170                                   |
| 3225K271-BC | 270(243-297)               | 175                      | 225                 | 455                                | 10                 | 40                                   | 21.0               | 0.25       | 150                                   |
| 3225K361-BC | 360(324-396)               | 230                      | 300                 | 595                                | 10                 | 40                                   | 35.0               | 0.25       | 115                                   |
| 3225K391-BC | 390(351-429)               | 250                      | 320                 | 650                                | 10                 | 40                                   | 39.0               | 0.25       | 105                                   |
| 3225K431-BC | 430(387-473)               | 275                      | 350                 | 710                                | 10                 | 40                                   | 40.0               | 0.25       | 95                                    |
| 3225K471-BC | 470(423-517)               | 300                      | 385                 | 775                                | 10                 | 40                                   | 42.0               | 0.25       | 90                                    |
| 3225K511-BC | 510(459-561)               | 320                      | 410                 | 845                                | 10                 | 40                                   | 45.0               | 0.25       | 85                                    |
| 3225K561-BC | 560(504-616)               | 350                      | 450                 | 930                                | 10                 | 40                                   | 49.0               | 0.25       | 80                                    |
| 3225K621-BC | 620(558-682)               | 395                      | 510                 | 1020                               | 10                 | 40                                   | 55.0               | 0.25       | 78                                    |
| 3225K681-BC | 680(612-748)               | 420                      | 560                 | 1120                               | 10                 | 40                                   | 60.0               | 0.25       | 75                                    |
| 3225K751-BC | 750(675-825)               | 460                      | 615                 | 1235                               | 10                 | 40                                   | 67.0               | 0.25       | 70                                    |
| 3225K781-BC | 780(702-858)               | 485                      | 640                 | 1290                               | 10                 | 40                                   | 67.0               | 0.25       | 65                                    |
| 3225K821-BC | 820(738-902)               | 510                      | 670                 | 1355                               | 10                 | 40                                   | 80.0               | 0.25       | 60                                    |

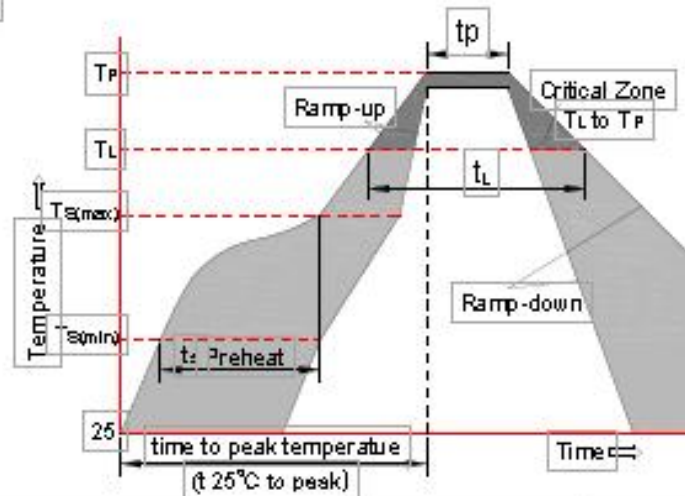
**SOLDERING GUIDELINES**

The usage of mild, non-activated fluxes for soldering is recommended, as well as proper cleaning of the PCB. The components are suitable for reflow soldering per JEDEC J-STD-020C.

- Wave soldering



Temperature characteristics at component terminal with dual-wave soldering

**- Reflow soldering**


| Profile feature                                      |  | Sn-Pb assembly       | Pb-Free assembly     |
|--|--|----------------------|----------------------|
| Average ramp-up rate ( $T_{s(max)}$ to $T_p$ )       |  | 3°C/sec. Max         | 3°C/sec. Max         |
| Preheat  | -Temperature min. ( $T_{s(min)}$ )     | +100°C               | +150°C               |
|  | -Temperature max. ( $T_{s(max)}$ )     | +150°C               | +200°C               |
|  | -Time ( $t_{s(min)}$ to $t_{s(max)}$ ) | 60-120 secs.         | 60-180 secs.         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                 |  | 3°C/sec. Max         | 3°C/sec. Max         |
| Time maintained above                                | -Temperature min. ( $T_L$ )            | +183°C               | +217°C               |
|  | -Time ( $t_L$ )                        | 60-150 secs.         | 60-150 secs.         |
| Peak classification temperature ( $T_p$ )            |  | +220°C to +240°C     | +240°C to +260°C     |
| Time within 5°C of actual peak temperature ( $t_p$ ) |  | 10 secs. to 30 secs. | 20 secs. to 40 secs. |
| Ramp-down rate                                       |  | 6°C/sec. max.        | 6°C/sec. max.        |
| Time 25°C to peak temperature                        |  | 6 min. max.          | 8 min. max.          |

Notes: All temperature refer to topside of the package, measured on the package body surface

Maximum number of reflow cycles: 3

**STORAGE CONDITION**

- As far as possible, the components should be employed within 24 months after delivery from Kangtai Semiconductor.
- They should be left in their original packing to avoid soldering problems due to oxidized contacts.
- Storage temperature: - 25 up to + 45°C.
- Relative humidity: < 75 % annual average, < 95 % on max. 30 days in a year.

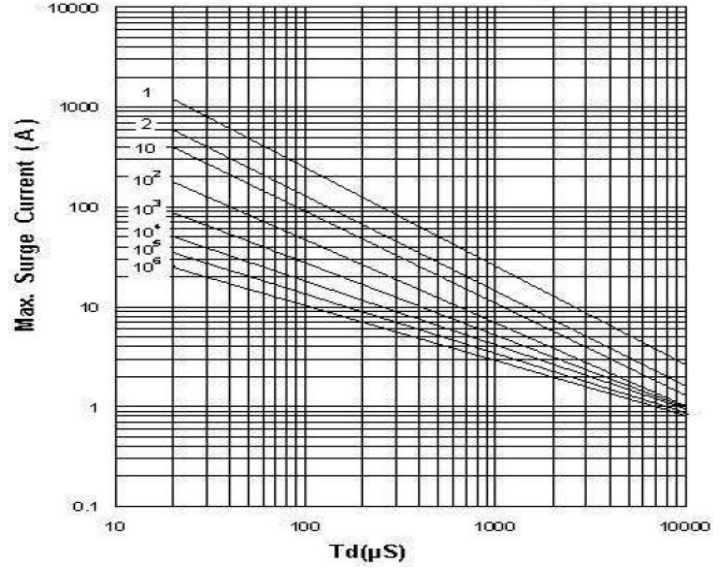
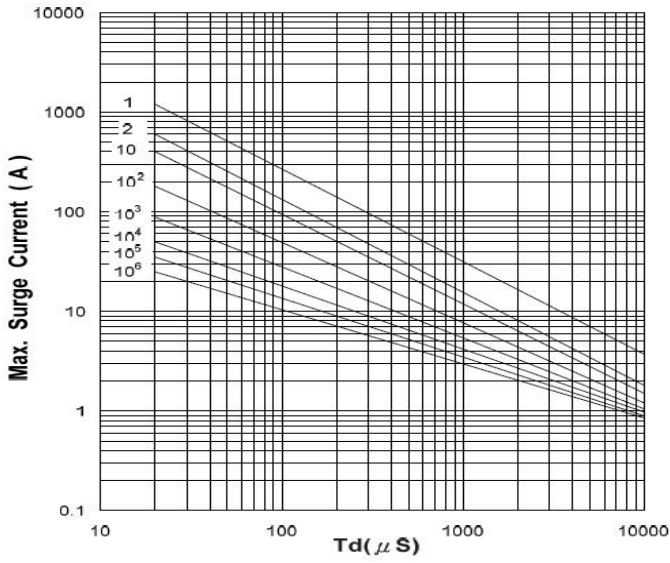




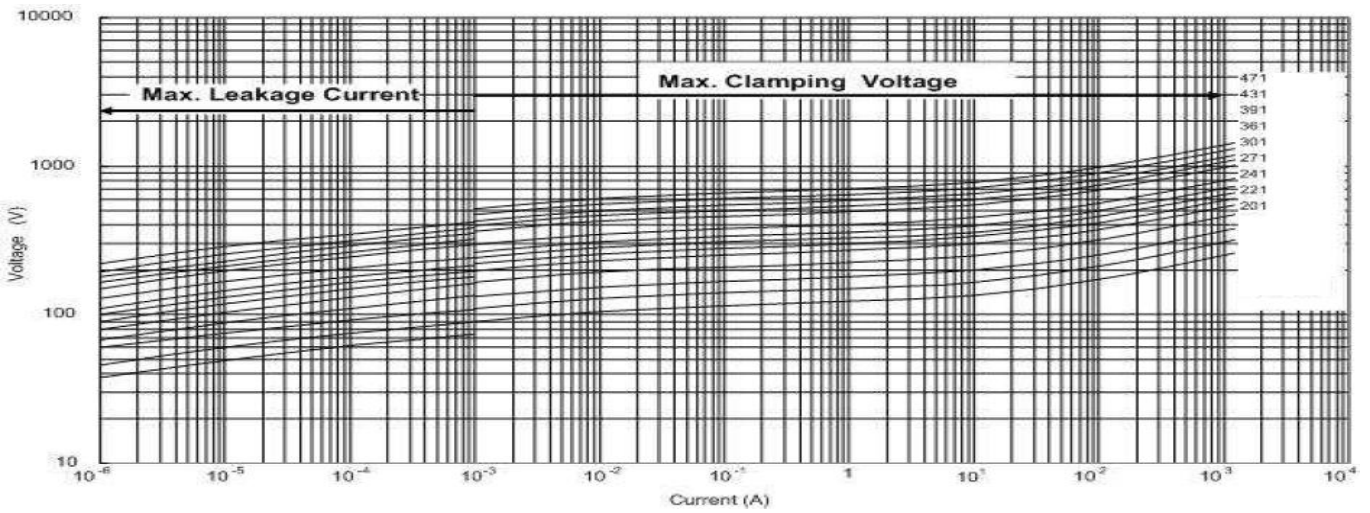
V/I CHARACTERISTICS V-I

VDR 3225K201 – 3225K471(H/BC)

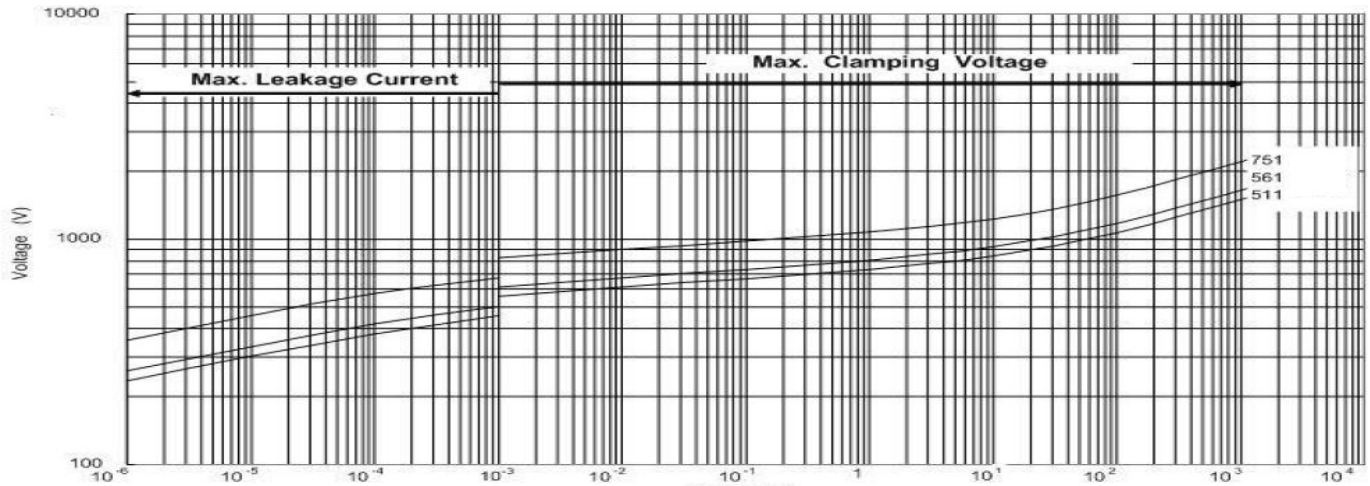
VDR 3225K511 – 3225K821(H/BC)



VDR 3225K201 – 3225K471(H/BC)

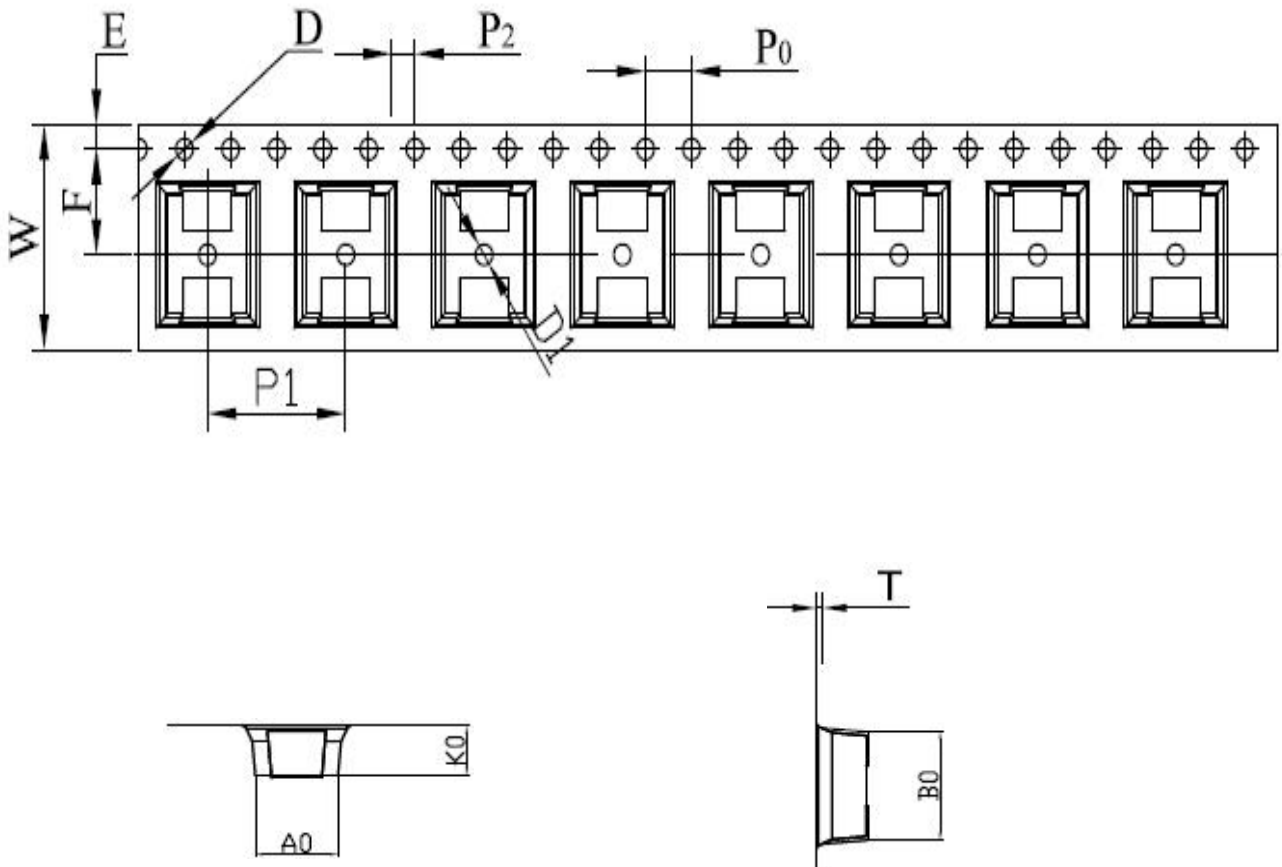


VDR-3225K511 – 3225K751(H/BC)

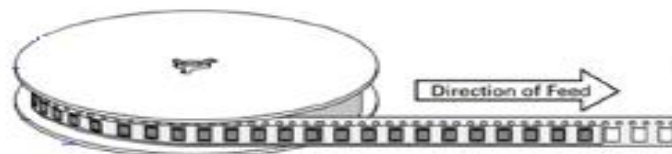


### Packing

Tape packing method description 16mm tape size

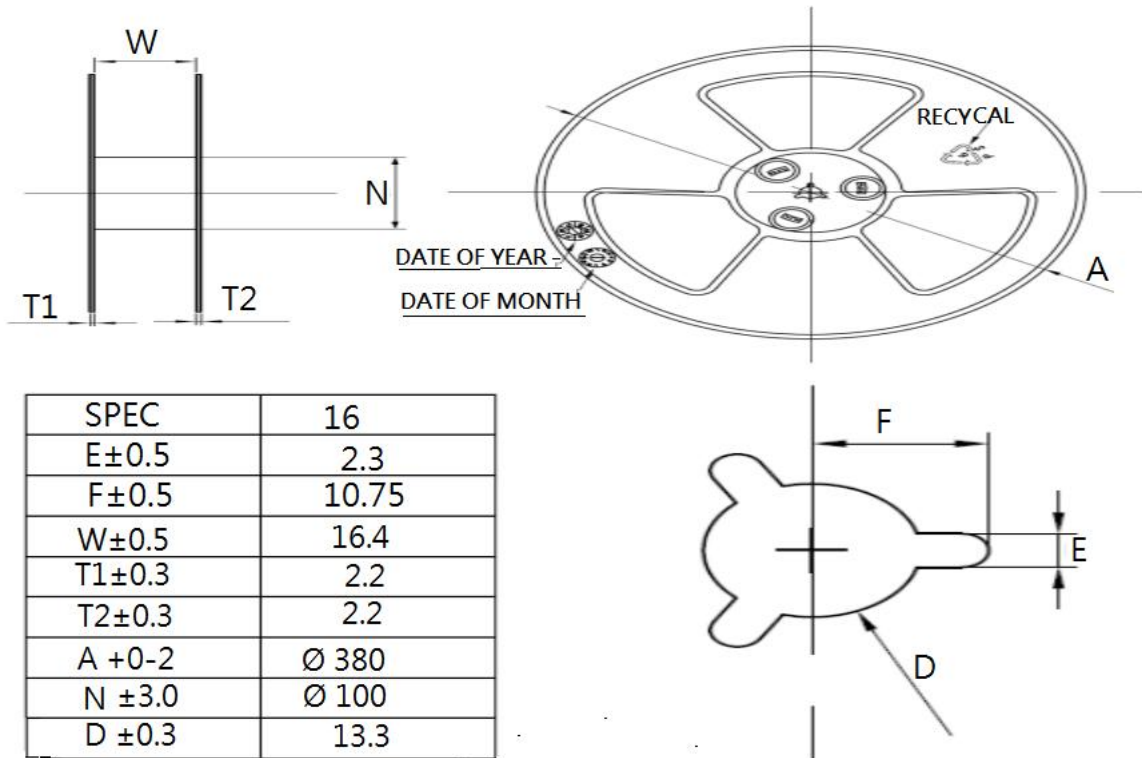


|        |          |           |           |           |                                    |           |          |
|--------|----------|-----------|-----------|-----------|------------------------------------|-----------|----------|
| symbol | A0       | B0        | K0        | P0        | P1                                 | P2        | 长度/盘     |
| Spec   | 6.60±0.1 | 8.70±0.1  | 4.50±0.1  | 4.00±0.10 | 12.0±0.10                          | 2.00±0.10 | 24000mm  |
| symbol | W        | T         | E         | F         | DO                                 | D1        | 元件/盘     |
| Spec   | 16.0±0.3 | 0.40±0.05 | 1.75±0.10 | 7.5±0.1   | 1.50 <sup>+0.1</sup> <sub>-0</sub> | 1.50±0.10 | 1820 pcs |

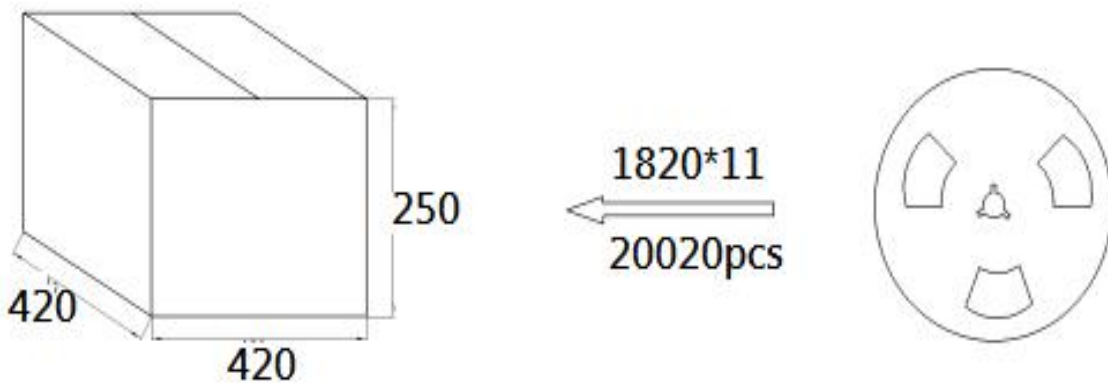




15 inch rubber disc size



Packing carton



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Varistors](#) category:*

*Click to view products by [VDR](#) manufacturer:*

Other Similar products are found below :

[R71ZOV151HC](#) [B72205S271K111](#) [B72214S110K151](#) [B72214S251K151](#) [B72540E250K62](#) [NTE1V020](#) [NTE1V130](#) [25FN511K](#)  
[S10K11G5S5](#) [ERZ-C14DK361U](#) [ERZ-C20DK221U](#) [ERZ-C32CK201B](#) [207869-1](#) [AS-13](#) [B72214S200K551](#) [B72280B112K1](#) [B72540E](#)  
[350K 62](#) [B72590D360A60](#) [B72650M301K93](#) [B72670M1140K72](#) [TVZ18EC271KBS](#) [TVZ20EB911KBS](#) [TVZ25D201KBS](#) [TVZ25D241KBS](#)  
[VDRH20X230BSE](#) [VZ07D220KBS](#) [VZ40D241KQ-N](#) [VZ40D241K](#) [VZ25D511KBS-N](#) [VZ20E511KBSX](#) [VZ20E221KBSX](#)  
[VZ10D471KBS-N](#) [ERZ-V20R221](#) [20A9FN241K](#) [B72205S350K211](#) [B72214S110K551](#) [B72510E140K62](#) [B72650M350K72](#)  
[TVZ25DN271KBS](#) [TVZ25D301KBS](#) [TVZ20EC911KBS](#) [TVZ20EBN911KBS](#) [TVZ18EC471KBS](#) [B72220S350K101](#) [B72540E300K62](#)  
[TND10V-271KB00AAA0](#) [NTE1V030](#) [NTE1V275](#) [NTE2V015](#) [NTE2V035](#)