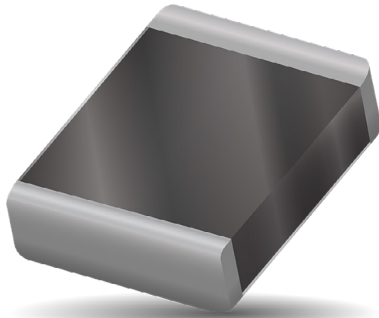


Glass Encapsulated TransGuard®

Multilayer Varistors



GENERAL DESCRIPTION

The Glass Encapsulated TransGuard® multilayer varistors are zinc oxide (ZnO) based ceramic semiconductor devices with non-linear, bi-directional V-I characteristics.

They have the advantage of offering bi-directional overvoltage protection as well as EMI/RFI attenuation in a single SMT package.

These large case size parts extend TransGuard range into high energy applications. In addition the glass encapsulation provides enhanced resistance against harsh environment or process such as acidic environment, salts or chlorite flux.

GENERAL CHARACTERISTICS

- Operating Temperature: -55°C to 125°C
- Case Size: 1206-2200
- Working Voltage: 16-85Vdc
- Energy: 0.7-12J
- Peak Current: 200-2000A

FEATURES

- Bi-Directional protection
- EMI/RFI attenuation in off-state
- Multi-strike capability
- Sub 1nS response to ESD strike
- High energy / High current
- Glass Encapsulated

APPLICATIONS

- Professional / Industrial / Commercial Applications
- IC Protection, DC motor protection
- Relays, Controllers, Sensors
- Smart Grids
- Alarms
- Various Applications where Glass Encapsulation is Needed for Harsh Environment / Acid-Resistance
- and more

HOW TO ORDER

| V | G | 1812 | 16 | P | 400 | R | P |
|----------|-------------------------|-----------|-----------------|---------------|------------------|--------------|------------------|
| Varistor | Glass Encapsulated Chip | Chip Size | Working Voltage | Energy Rating | Clamping Voltage | Package | Termination |
| | | 1206 | | | | D = 7" reel | P = Ni/Sn plated |
| | | 1210 | 16 = 16Vdc | D = 0.4J | 380 = 38V | R = 7" reel | |
| | | 1812 | 18 = 18Vdc | F = 0.7J | 390 = 40V | T = 13" reel | |
| | | 2220 | 22 = 22Vdc | H = 1.2J | 400 = 42V | | |
| | | 3220 | 26 = 26Vdc | J = 1.5-1.6J | 440 = 44V | | |
| | | | 30 = 30Vdc | K = 0.6J | 490 = 49V | | |
| | | | 31 = 31Vdc | N = 1.1J | 540 = 54V | | |
| | | | 38 = 38Vdc | R = 1.7J | 560 = 60V | | |
| | | | 45 = 45Vdc | S = 2.0J | 570 = 57V | | |
| | | | 48 = 48Vdc | P = 2.5-3.7J | 620 = 67V | | |
| | | | 56 = 56Vdc | U = 4.0-5.0J | 650 = 65V | | |
| | | | 60 = 60Vdc | W = 5.1-6.0J | 770 = 77V | | |
| | | | 65 = 65Vdc | Y = 6.5-12J | 900 = 90V | | |
| | | | 85 = 85Vdc | | | | |
| | | | 101 = 100Vdc | | | | |

PHYSICAL DIMENSIONS: MM (INCHES)

| Size (EIA) | Length (L) | Width (W) | Max Thickness (T) | Land Length (t) |
|------------|----------------------------|----------------------------|--------------------------------|---------------------------|
| 1206 | 3.20±0.20 (0.126±0.008) | 1.60±0.20 (0.063±0.008) | 1.70 (0.067) | 0.94 max. (0.037 max.) |
| 1210 | 3.20±0.20 (0.126±0.008) | 2.49±0.20 (0.098±0.008) | 1.70 (0.067) | 0.14 max. (0.045 max.) |
| 1812 | 4.50±0.30 (0.177±0.012) | 3.20±0.30 (0.126±0.012) | 2.00 (0.079) 2.50 (0.098)1) | 1.00 max. (0.040 max.) |
| 2220 | 5.70±0.40 (0.224±0.016) | 5.00±0.40 (0.197±0.016) | 2.50 (0.098) | 1.00 max. (0.040 max.) |
| 3220 | 8.20±0.40 (0.323±0.016) | 5.00±0.40 (0.197±0.016) | 2.50 max. (0.098 max.) | 1.30 max. (0.051 max.) |

1) Applicable for: VG181285W201, VG1812101W251, VG1812125U271



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

ELECTRICAL CHARACTERISTICS

| Part Number | V _w (DC) | V _w (AC) | V _B | V _C | I _{VC} | I _L | E _T | I _p | Cap | Freq |
|--------------|---------------------|---------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-------|------|
| VG120616K390 | 16 | 11 | 24.5±10% | 40 | 1 | 15 | 0.6 | 200 | 900 | K |
| VG120616N390 | 16 | 11 | 24.5±10% | 40 | 1 | 15 | 1.1 | 300 | 1300 | K |
| VG181216P390 | 16 | 11 | 24.5±10% | 40 | 5 | 15 | 2.9 | 1000 | 7000 | K |
| VG181216P400 | 16 | 11 | 24.5±10% | 42 | 5 | 10 | 2.9 | 1000 | 5000 | K |
| VG222016Y400 | 16 | 11 | 24.5±10% | 42 | 10 | 10 | 7.2 | 1500 | 13000 | K |
| VG120618D400 | 18 | 13 | 25.5±10% | 42 | 1 | 15 | 0.4 | 150 | 1200 | K |
| VG120618E380 | 18 | 14 | 22±10% | 38 | 1.0 | 15 | 0.5 | 200 | 1000 | K |
| VG121018J380 | 18 | 14 | 22±10% | 38 | 2.5 | 15 | 1.5 | 400 | 2300 | K |
| VG121018J400 | 18 | 13 | 25.5±10% | 42 | 5 | 10 | 1.6 | 500 | 3100 | K |
| VG181218P380 | 18 | 14 | 22±10% | 38 | 5.0 | 15 | 2.3 | 800 | 5000 | K |
| VG181218P440 | 18 | 14 | 27.5±10% | 44 | 5 | 15 | 2.9 | 800 | 5000 | K |
| VG222018W380 | 18 | 14 | 22±10% | 38 | 10 | 15 | 5.8 | 1200 | 18000 | K |
| VG121022R440 | 22 | 17 | 27±10% | 44 | 2.5 | 15 | 1.7 | 400 | 1600 | K |
| VG222022Y440 | 22 | 17 | 27±10% | 44 | 10 | 15 | 7.2 | 1200 | 18000 | K |
| VG222022Y490 | 22 | 17 | 30±10% | 49 | 10 | 15 | 6.8 | 1200 | 12000 | K |
| VG120626F540 | 26 | 18 | 33.0±10% | 54 | 1 | 15 | 0.7 | 200 | 600 | K |
| VG121026H560 | 26 | 18 | 34.5±10% | 60 | 5 | 15 | 1.2 | 300 | 1200 | K |
| VG121026S540 | 26 | 20 | 33±10% | 54 | 2.5 | 15 | 1.9 | 400 | 1600 | K |
| VG181226P540 | 26 | 20 | 35±10% | 54 | 5 | 15 | 3.0 | 800 | 3000 | K |
| VG181226P570 | 26 | 23 | 35±10% | 57 | 5 | 15 | 2.5 | 600 | 3000 | K |
| VG222026Y540 | 26 | 20 | 33±10% | 54 | 10 | 15 | 7.8 | 1200 | 11000 | K |
| VG222026Y570 | 26 | 23 | 35.0±10% | 57 | 10 | 15 | 6.8 | 1100 | 7000 | K |
| VG322026N570 | 26 | 20 | 33±10% | 57 | 10 | 15 | 1.1 | 400 | 5500 | K |
| VG121030H620 | 30 | 21 | 41.0±10% | 67 | 5 | 15 | 1.2 | 280 | 1850 | K |
| VG181230Y650 | 30 | 21 | 39±10% | 65 | 5 | 50 | 6.5 | 800 | 3500 | K |
| VG181230Y770 | 30 | 21 | 47.5±10% | 77 | 5 | 50 | 6.5 | 800 | 3300 | K |
| VG120631M650 | 31 | 25 | 39±10% | 65 | 1.0 | 15 | 1.0 | 200 | 700 | K |
| VG121031R650 | 31 | 25 | 39±10% | 65 | 2.5 | 15 | 1.7 | 300 | 1200 | K |
| VG181231P650 | 31 | 25 | 39±10% | 65 | 5 | 15 | 3.7 | 800 | 2600 | K |
| VG222031Y650 | 31 | 25 | 39.0±10% | 65 | 10 | 15 | 9.6 | 1200 | 6100 | K |
| VG120638N770 | 38 | 30 | 47±10% | 77 | 1.0 | 15 | 1.1 | 200 | 500 | K |
| VG121038S770 | 38 | 30 | 47.0±10% | 77 | 2.5 | 15 | 2 | 400 | 1000 | K |
| VG181238U770 | 38 | 30 | 47.0±10% | 77 | 5 | 15 | 4.2 | 800 | 1300 | K |
| VG222038Y770 | 38 | 30 | 47.0±10% | 77 | 10 | 15 | 12 | 2000 | 4200 | K |
| VG322038J920 | 38 | 30 | 47±10% | 92 | 10.0 | 15 | 1.5 | 400 | 2600 | K |
| VG121045S900 | 45 | 35 | 56±10% | 90 | 2.5 | 15 | 2 | 300 | 800 | K |
| VG181245U900 | 45 | 35 | 56.0±10% | 90 | 5 | 15 | 4.0 | 500 | 1200 | K |
| VG222045Y900 | 45 | 35 | 56±10% | 90 | 10 | 15 | 12 | 1000 | 5000 | K |
| VG121048H101 | 48 | 34 | 62.0±10% | 100 | 5 | 15 | 1.2 | 250 | 500 | K |
| VG121056P110 | 56 | 40 | 68±10% | 110 | 2.5 | 15 | 2.3 | 250 | 500 | K |
| VG181256U111 | 56 | 40 | 68.0±10% | 110 | 5 | 15 | 4.8 | 500 | 800 | K |
| VG222056Y111 | 56 | 40 | 68.0±10% | 110 | 10 | 15 | 9 | 1000 | 2000 | K |
| VG121060J121 | 60 | 42 | 76.0±10% | 120 | 5 | 15 | 1.5 | 250 | 400 | K |
| VG120665L131 | 65 | 50 | 82±10% | 135 | 1.0 | 15 | 0.8 | 200 | 250 | K |
| VG121065P131 | 65 | 50 | 82.0±10% | 135 | 2.5 | 15 | 2.7 | 350 | 600 | K |
| VG181265U131 | 65 | 50 | 82.0±10% | 135 | 5 | 15 | 4.5 | 400 | 600 | K |
| VG222065Y131 | 65 | 50 | 82.0±10% | 135 | 10 | 15 | 6.5 | 1100 | 3000 | K |
| VG181285U161 | 85 | 60 | 100±10% | 165 | 5 | 15 | 4.5 | 400 | 500 | K |
| VG222085Y161 | 85 | 60 | 100±10% | 165 | 10 | 15 | 6.8 | 800 | 1500 | K |

TELECOM APPLICATIONS

Parts are specified in accordance to CCITT 10x700µs pulse test in addition to standard industrial specifications.

| Part Number | V _w (DC) | V _w (AC) | V _B | V _C | I _{VC} | I _L | E _T | I _p | Cap | Freq | CCITT |
|---------------|---------------------|---------------------|----------------|----------------|-----------------|----------------|----------------|----------------|-----|------|-------|
| VG181285W201 | 85 | 60 | 110±10% | 200 | 45 | 15 | 6.0 | 400 | 800 | K | 45 |
| VG1812101W251 | 100 | 75 | 120±10% | 250 | 45 | 15 | 6.0 | 400 | 500 | K | 45 |
| VG1812125U271 | 125 | 95 | 150±10% | 270 | 45 | 15 | 5 | 250 | 250 | K | 45 |

V_w(DC) DC Working Voltage [V]

V_w(AC) AC Working Voltage [V]

V_B Typical Breakdown Voltage [V @ 1mA DC, 25°C]

V_C Clamping Voltage [V @ I_{VC}]

I_{VC} Test Current for V_C [A, 8x20µs]

I_L Maximum leakage current at the working voltage, 25°C [µA]

E_T Transient Energy Rating [J, 10x1000µs]

I_p Peak Current Rating [A, 8x20µs]

Cap Typical capacitance [pF] @ frequency specified and 0.5VRMS, 25°C, M = 1MHz, K = 1kHz

CCITT 10 pulses applied at 1min intervals [A, 10x700µs]