



## 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

## 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 and more
- Various Applications where Glass Encapsulation is Needed for Harsh Environment / Acid-Resistance

## HOW TO ORDER

<b>V</b>	<b>G</b>	<b>1812</b>	<b>16</b>	<b>P</b>	<b>400</b>	<b>R</b>	<b>P</b>
Varistor	Glass Encapsulate Chip	Chip Size	Working Voltage	Energy Rating	Clamping Voltage	Package	Termination
		1210 1812 2220	16 = 16Vdc 22 = 22Vdc 38 = 38Vdc 65 = 65Vdc	S = 2.0J P = 2.7-3.0J U = 4.0-5.0J Y = 7.2-12J	400 = 42V 440 = 44V 770 = 77V 131 = 135V	D = 7" reel R = 7" reel T = 13" reel	P = Ni/Sn plated

## PHYSICAL DIMENSIONS: mm (inches)

Size (EIA)	Length (L)	Width (W)	Max Thickness (T)	Land Length (t)
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)	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.)

## ELECTRIAL CHARACTERISTICS

AVX PN	V <sub>W</sub> (DC)	V <sub>W</sub> (AC)	V <sub>B</sub>	V <sub>C</sub>	I <sub>VC</sub>	I <sub>L</sub>	E <sub>T</sub>	I <sub>P</sub>	Cap	Freq
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
VG121022R440	22	17	27±10%	44	2.5	10	1.7	400	1600	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
VG121065P131	65	50	82.0±10%	135	2.5	15	2.7	350	600	K

V<sub>W</sub>(DC) DC Working Voltage [V]  
 V<sub>W</sub>(AC) AC Working Voltage [V]  
 V<sub>B</sub> Typical Breakdown Voltage [V @ 1mA<sub>DC</sub>, 25°C]  
 V<sub>C</sub> Clamping Voltage [V @ I<sub>VC</sub>]  
 I<sub>VC</sub> Test Current for V<sub>C</sub> [A, 8x20µs]  
 I<sub>L</sub> Maximum leakage current at the working voltage, 25°C [µA]

E<sub>T</sub> Transient Energy Rating [J, 10x1000µs]  
 I<sub>P</sub> Peak Current Rating [A, 8x20µs]  
 Cap Typical capacitance [pF] @ frequency specified and 0.5V<sub>RMS</sub>, 25°C, M = 1MHz, K = 1kHz