

# 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

<b>V</b>	<b>G</b>	<b>1812</b>	<b>16</b>	<b>P</b>	<b>400</b>	<b>R</b>	<b>P</b>
↓	↓	↓	↓	↓	↓	↓	↓
<b>Varistor</b>	<b>Glass Encapsulated Chip</b>	<b>Chip Size</b>	<b>Working Voltage</b>	<b>Energy Rating</b>	<b>Clamping Voltage</b>	<b>Package</b>	<b>Termination</b>
		1206 1210 1812 2220 3220	16 = 16Vdc 18 = 18Vdc 22 = 22Vdc 26 = 26Vdc 30 = 30Vdc 31 = 31Vdc 38 = 38Vdc 45 = 45Vdc 48 = 48Vdc 56 = 56Vdc 60 = 60Vdc 65 = 65Vdc 85 = 85Vdc 101 = 100Vdc	D = 0.4J F = 0.7J H = 1.2J J = 1.5-1.6J K = 0.6J N = 1.1J R = 1.7J S = 2.0J P = 2.5-3.7J U = 4.0-5.0J W = 5.1-6.0J Y = 6.5-12J	380 = 38V 390 = 40V 400 = 42V 440 = 44V 490 = 49V 540 = 54V 560 = 60V 570 = 57V 620 = 67V 650 = 65V	770 = 77V 900 = 90V 101 = 100V 111 = 110V 121 = 120V 131 = 135V 161 = 165V 201 = 200V 251 = 250V	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)
<b>1206</b>	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.)
<b>1210</b>	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.)
<b>1812</b>	4.50±0.30 (0.177±0.012)	3.20±0.30 (0.126±0.012)	2.00 (0.079) 2.50 (0.098) <sup>1)</sup>	1.00 max. (0.040 max.)
<b>2220</b>	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.)
<b>3220</b>	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.)

<sup>1)</sup> Applicable for: VG181285W201, VG1812101W251, VG1812125U271

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### ELECTRICAL 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
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.

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	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 <sub>W</sub> (DC)	DC Working Voltage [V]	E <sub>T</sub>	Transient Energy Rating [J, 10x1000µs]
V <sub>W</sub> (AC)	AC Working Voltage [V]	I <sub>P</sub>	Peak Current Rating [A, 8x20µs]
V <sub>B</sub>	Typical Breakdown Voltage [V @ 1mA <sub>DC</sub> , 25°C]	Cap	Typical capacitance [pF] @ frequency specified and 0.5V <sub>RMS</sub> , 25°C, M = 1MHz, K = 1kHz
V <sub>C</sub>	Clamping Voltage [V @ I <sub>VC</sub> ]	CCITT	10 pulses applied at 1min intervals [A, 10x700µs]
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]		