

High Temperature +150°C Automotive Series Varistors



+150°C Glass Encapsulated High Temperature TransGuard®



GENERAL DESCRIPTION

AVX High Temperature 150°C Multi-Layer Varistors are designed for underhood and other high temperature automotive or industrial applications. Parts are AEC-Q200 qualified.

They offer bi-directional overvoltage protection as well as EMI/RFI attenuation in a single SMT package. This allows designers the ability to combine the circuit protection and EMI/RFI attenuation function into a single highly reliable device. The glass encapsulation provides enhanced resistance against harsh environment or process such as acidic environment, salts or chlorite flux.

Available in 1206 to 3220 case size, 16 - 31Vdc working voltage, energy rating 0.6 -13J, load dump energy 1.5 - 50J, peak current 200 - 1800A and capacitance 700 - 15000pF. Operating temperature range is -55°C to +150°C. Parts offer excellent lead free solderability thanks to Ni Barrier/100% Sn termination.

GENERAL CHARACTERISTICS

- Operating Temp.: -55 to +150°C
- Working Voltage: 16 to 31Vdc
- Case Size: 1206 to 3220

FEATURES AND BENEFITS

- AEC-Q200 Qualified
- 150°C High Temp
- EMI/RFI filtering in the off-state

TYPICAL APPLICATIONS

- Under hood
- Down Hole Drilling
- Any high temperature application

HOW TO ORDER

VG
Varistor Glass Encapsulated

AH
Automotive High Temp 150°C

1206
Case Size
1206
1210
1812
2220
3220

16
Working Voltage
16 = 16Vdc
22 = 22Vdc
26 = 26Vdc
31 = 31Vdc

K
Energy Rating
H = 1.2J
J = 1.5-1.6J
K = 0.6J
M = 1.0J
P = 2.5-3.7J
R = 1.7J
S = 1.9-2.0J
Y = 6.5-12J
Z = 13J

390
Clamping Voltage
390 = 40V
400 = 42V
490 = 49V
560 = 60V
570 = 57V
650 = 57V

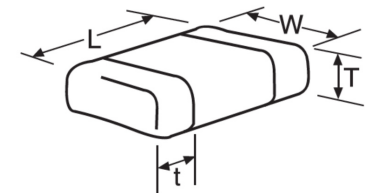
R
Packaging
D = 7" reel
R = 7" reel
T = 13" reel

P
Termination
P = Ni/Sn plated



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 max. (0.067 max.) | 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 max. (0.067 max.) | 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 max. (0.079 max.) | 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 max. (0.098 max.) | 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.) |



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| AVX PN | V _w (DC) | V _w (AC) | V _B | V _C | I _{vc} | I _L | E _T | E _{LD} | I _p | Cap | V _{Jump} | P _{Diss. Max} |
|----------------|---------------------|---------------------|----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|-------|-------------------|------------------------|
| | Vdc | Vac | V | V | A | μA | J | J | A | pF | V | W |
| VGAH120616K390 | 16 | 11 | 24.5±10% | 40 | 1.0 | 15 | 0.6 | 1.5 | 200 | 1100 | 27.5 | 0.01 |
| VGAH121016J400 | 16 | 13 | 25.5±10% | 42 | 5.0 | 15 | 1.6 | 3.0 | 500 | 2300 | 27.5 | 0.03 |
| VGAH121016S390 | 16 | 14 | 24.5±10% | 40 | 2.5 | 15 | 2.0 | 5.0 | 500 | 3000 | 27.5 | 0.01 |
| VGAH181216P390 | 16 | 11 | 24.5±10% | 40 | 5.0 | 15 | 2.9 | 10.0 | 1000 | 7000 | 27.5 | 0.07 |
| VGAH222016Y400 | 16 | 11 | 24.5±10% | 42 | 10.0 | 10 | 7.2 | 25.0 | 1500 | 13000 | 27.5 | 0.1 |
| VGAH222022Y490 | 22 | 17 | 30±10% | 49 | 10.0 | 15 | 6.8 | 25.0 | 1200 | 12000 | 27.5 | 0.03 |
| VGAH121026H560 | 26 | 18 | 34.5±10% | 60 | 5.0 | 15 | 1.2 | 3.0 | 300 | 1200 | 27.5 | 0.018 |
| VGAH181226P570 | 26 | 23 | 35±10% | 57 | 5.0 | 15 | 3.0 | 8.0 | 600 | 3000 | 30.0 | 0.015 |
| VGAH222026Y570 | 26 | 23 | 35±10% | 57 | 10.0 | 15 | 6.8 | 20.0 | 1100 | 7000 | 30.0 | 0.03 |
| VGAH322026Z570 | 26 | 23 | 35±10% | 57 | 10.0 | 15 | 13.0 | 50.0 | 1800 | 15000 | 30.0 | 0.04 |
| VGAH120631M650 | 31 | 25 | 39±10% | 65 | 1.0 | 15 | 1.0 | 2.5 | 200 | 700 | 30.0 | 0.03 |
| VGAH121031R650 | 31 | 25 | 39±10% | 65 | 2.5 | 15 | 1.7 | 4.5 | 300 | 1200 | 30.0 | 0.05 |
| VGAH181231P650 | 31 | 25 | 39±10% | 65 | 5.0 | 15 | 3.7 | 8.0 | 800 | 2600 | 30.0 | 0.06 |
| VGAH222031Y650 | 31 | 25 | 39±10% | 65 | 10.0 | 15 | 9.6 | 23.0 | 1200 | 6100 | 30.0 | 0.03 |

V_w(DC) DC Working Voltage [V]

V_w(AC) AC Working Voltage [V]

V_B Typical Breakdown Voltage [V @ 1mA_{DC}]

V_C Clamping Voltage [V @ I_{vc}]

I_{vc} Test Current for V_C

I_L Maximum leakage current at the working voltage [μA]

E_T Transient Energy Rating [J, 10x1000μS]

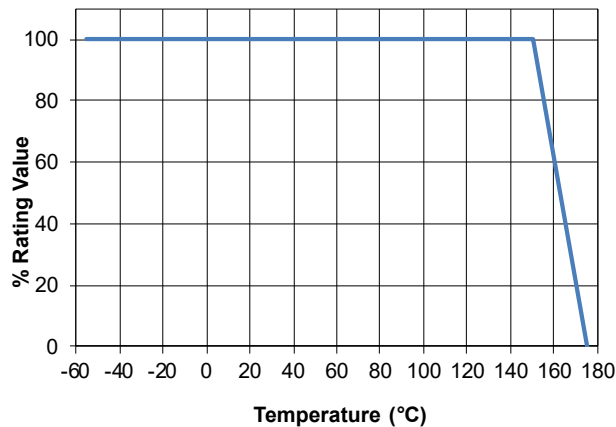
I_p Peak Current Rating [A, 8x20μS]

Cap Typical capacitance [pF] @ frequency specified and 0.5V_{RMS}

V_{Jump} Jump Start (V)

P_{Diss. Max} Power Dissipation (W)

POWER DERATING CURVE (CURRENT, ENERGY, POWER)



OPERATING VOLTAGE DERATING

