

Miniature AC Varistor – MAV

Low Power AC and Low Capacitance DC Circuit Protection

GENERAL DESCRIPTION

AVX Miniature AC Varistors are designed for use in low power AC circuit protection. MAV series devices are an ideal solution to transient suppression in LC resonant circuits intended for signal & power transfer. The AVX part provides low loss in the resonant circuit yet is able to clamp large amounts of transients in a bi-directional manner.

The ability to handle large transients makes the MAV series useful in low power AC circuit protection and the AEC Q200 qualification allows for use in automotive applications.

Low capacitance makes these parts useful also for higher DC voltage data lines and other capacitance sensitive applications.



GENERAL CHARACTERISTICS

- Operating Temperature: -55 to +125°C
- Working Voltage: 70Vdc / 52Vac
- Case Size: 0402, 0603, 0405 2xArray

FEATURES

- 110 Pk-Pk @ 125kHz capability
- AEC Q200 qualified
- ESD rated to 25kV (HBM ESD Level 6)
- EMI/RFI attenuation in off state
- Bi-Directional protection

APPLICATIONS

- LC resonant circuits
- AC sampling circuitry
- Transformer secondaries
- GFI modules
- Immobilizers
- Keyless entry
- Data lines
- Capacitance sensitive applications and more

HOW TO ORDER

| | | | | | |
|------------|--|-------------|---|-------------------------------|--|
| MAV | 002 | 0 | W | P | |
| Series | Size | Capacitance | Packaging | Termination | |
| | 001 = 0603 002 = 0405 004 = 0402 | 0 = Low | D = 7" reel (1,000 pcs) R = 7" reel (4,000 pcs) T = 13" reel (10,000 pcs) W = 7" Reel (10,000 pcs 0402 only) | P = Plated Sn over Ni barrier | |



ANTENNAGUARD CATALOG PART NUMBERS/ELECTRICAL VALUES

| AVX Part Number | V _W (DC) | V _W (AC) | V _B | V _C | I _{VC} | E _T | I _P | I _L | Cap | Elements |
|-----------------|---------------------|---------------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------|----------|
| MAV0010_P | 70 | 52 | 120 ±15% | 225 | 1 | 0.015 | 2 | 10 | 22pF Max | 1 |
| MAV0020_P | 70 | 52 | 120 ±15% | 225 | 1 | 0.020 | 3 | 10 | 8pF Max | 2 |
| MAV0040_P | 70 | 52 | 120 ± 15% | 225 | 1 | 0.020 | 1 | 10 | 6pF Max | 1 |

└ Packaging Code

- | | | | |
|---------------------|--|----------------|---|
| V _W (DC) | DC Working Voltage [V] | I _L | Maximum leakage current at the working voltage [μA] |
| V _W (AC) | AC Working Voltage [V] | E _T | Transient Energy Rating [J, 10x100μS] |
| V _B | Breakdown Voltage [V @ 1mA _{DC}] | I _P | Peak Current Rating [A, 8x10μS] |
| V _C | Clamping Voltage [V @ I _{VC}] | Cap | Maximum capacitance @ 1MHz and 0.5V _{RMS} |

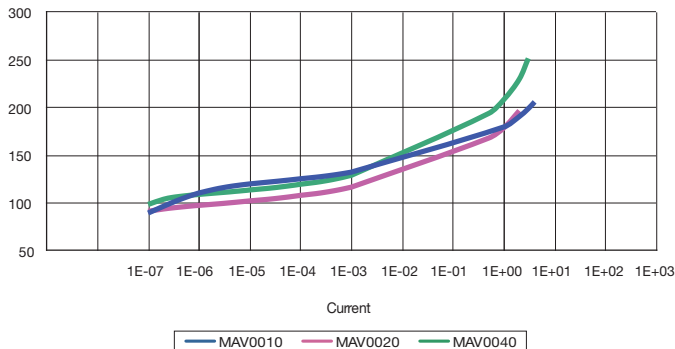
Miniature AC Varistor – MAV



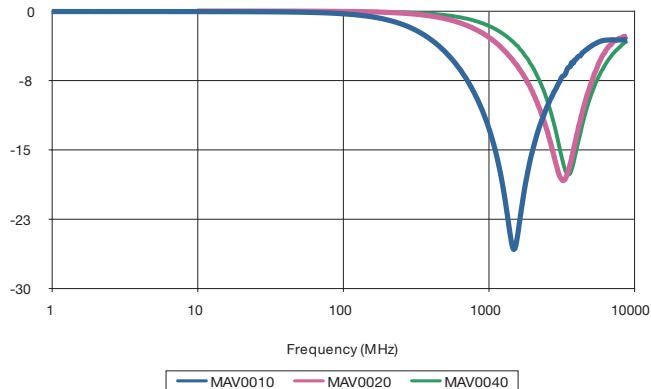
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TYPICAL PERFORMANCE CURVES

Voltage/Current Characteristics

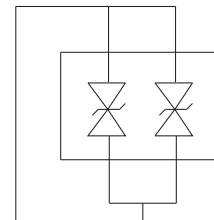
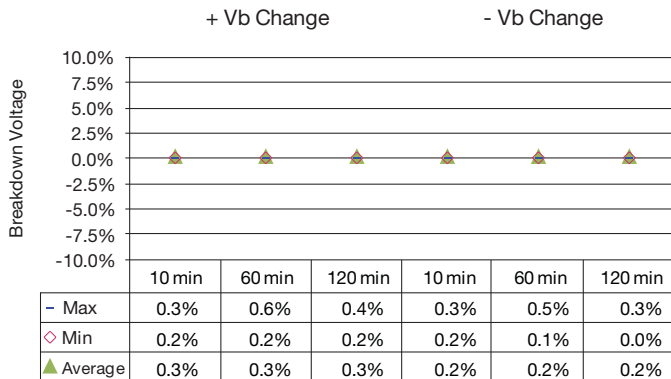


Transmission Characteristics



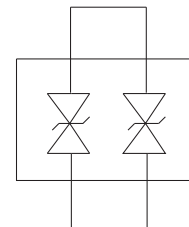
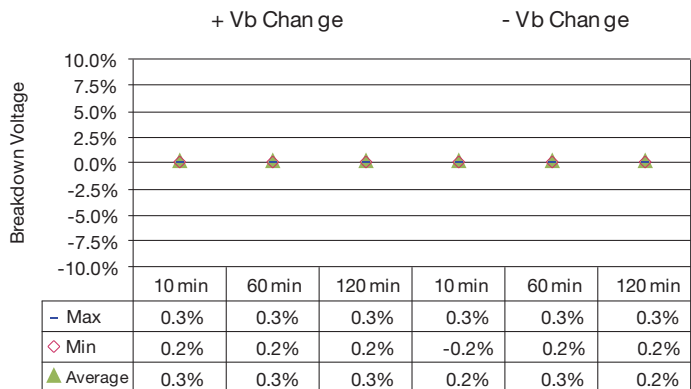
TYPICAL PERFORMANCE CURVES

Impact of AC Voltage on Breakdown Voltage
Parallel 110VPP @ 125 kHz



Apply 110V pp
125KHz Sine wave
(Parallel)

Impact of AC Voltage on Breakdown Voltage
Series 110VPP @ 125 kHz



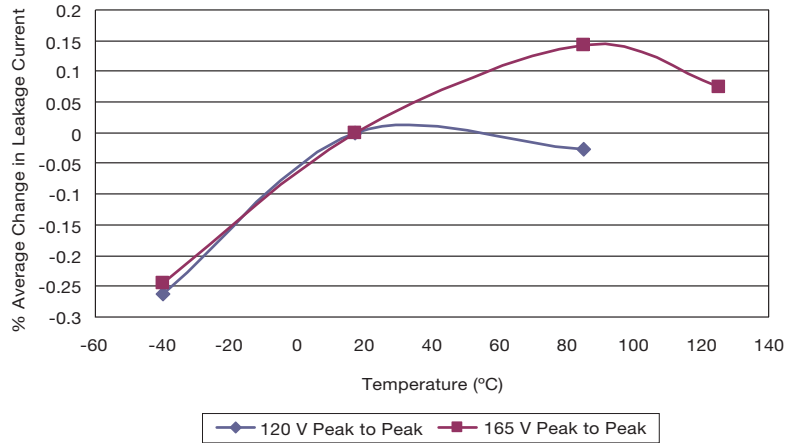
Apply 110V pp
125KHz Sine wave
(Series)

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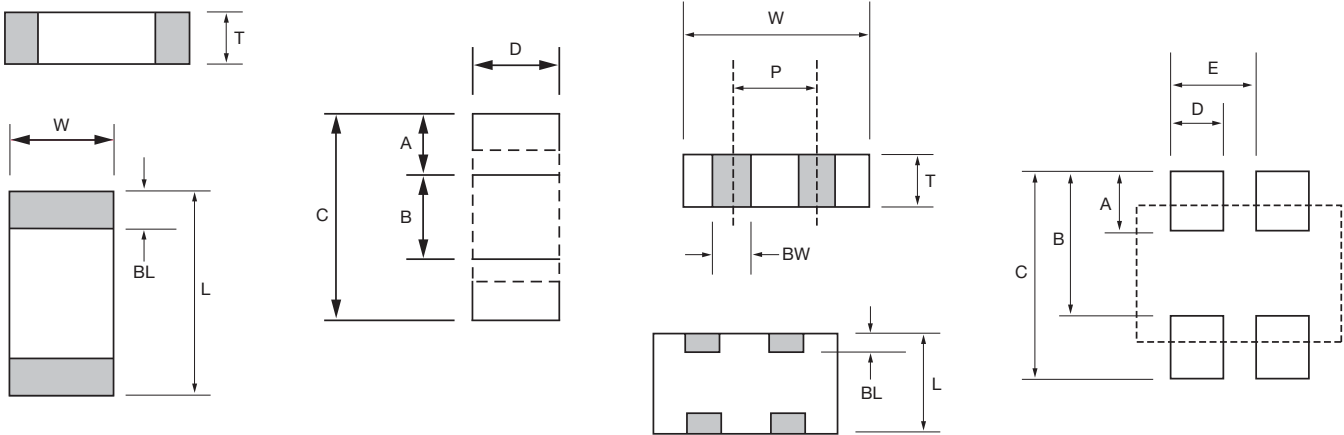


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IMPACT OF AC VOLTAGE ON LEAKAGE CURRENT



PHYSICAL DIMENSIONS AND RECOMMENDED PAD LAYOUT



| L | W | T | BW | BL | P | A | B | C | D | E |
|------------------------------|------------------------------|-------------------------|------------------------------|------------------------------|------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| MAV0010 | | | | | | | | | | |
| 1.60 ± 0.15 (0.063±0.006) | 0.80 ± 0.15 (0.032±0.006) | 0.90 Max (0.035) Max | N/A | 0.35 ± 0.15 (0.014±0.006) | N/A | 0.89 (0.035) | 0.76 (0.030) | 2.54 (0.100) | 0.76 (0.030) | N/A |
| MAV0020 | | | | | | | | | | |
| 1.00 ± 0.15 (0.039±0.006) | 1.37 ± 0.15 (0.054±0.006) | 0.66 Max (0.026) Max | 0.36 ± 0.10 (0.014±0.004) | 0.20 ± 0.10 (0.008±0.004) | 0.64 REF (0.025)REF | 0.46 (0.018) | 0.74 (0.029) | 1.20 (0.047) | 0.30 (0.012) | 0.64 (0.025) |
| MAV0040 | | | | | | | | | | |
| 1.00±0.10 (0.040±0.004) | 0.50±0.10 (0.020±0.004) | 0.60 Max (0.024) Max | N/A | 0.25±0.15 (0.010±0.006) | N/A | 0.61 (0.024) | 0.51 (0.020) | 1.70 (0.067) | 0.51 (0.020) | N/A |