CAN BUS Varistor

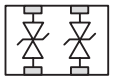
GENERAL DESCRIPTION

The CAN BUS varistor is a zinc oxide (ZnO) based ceramic semiconductor device with non-linear voltage-current characteristics (bi-directional) similar to back-to-back Zener diodes and an EMC capacitor in parallel (see equivalent circuit model). They have the added advantage of greater current and energy handling capabilities as well as EMI/RFI attenuation. Devices are fabricated by a ceramic sintering process that yields a structure of conductive ZnO grains surrounded by electrically insulating barriers, creating varistor like behavior.

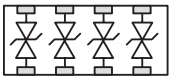
HOW TO ORDER

CAN	0001	D	P
Style	**Case Size**	**Packaging Code (Reel Size)**	**Termination**
Controlled Area Network Varistor Series	0001 = 0603 Discrete 0002 = 0405 2-Element 0004 = 0612 4-Element 0005 = 0402 Discrete	D = 7" reel (1,000 pcs.) R = 7" reel (4,000 pcs.) T = 13" reel (10,000 pcs.) W = 7" reel (10,000 pcs.)	P = Ni/Sn Alloy (Plated)

0402, 0603 Discrete



0405 Array



0612 Array

PERFORMANCE CHARACTERISTICS

AVX Part No.	V_W (DC)	V_W (AC)	V_B	I_L	E_T	I_P	Cap.	Case Size	Elements
CAN0001_ _	≤18	≤14	120	2	0.015	4	22	0603	1
CAN0002_ _	≤18	≤14	70	2	0.015	4	22	0405	2
CAN0004_ _	≤18	≤14	100	2	0.015	4	22	0612	4
CAN0005_ _	≤18	≤14	21.6	5µa	0.020	1	15pF ±30%	0402	1

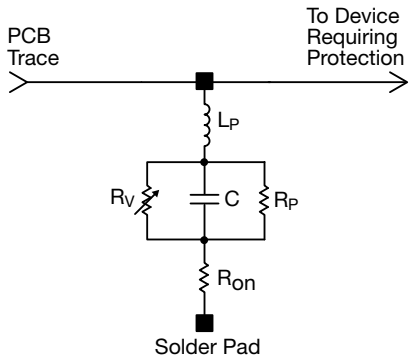
Termination Finish Code
Packaging Code

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 (A, 8x20µS)

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	Maximum Capacitance (pF) @ 1 MHz and 0.5Vrms
Temp Range	-55ºC to +125ºC

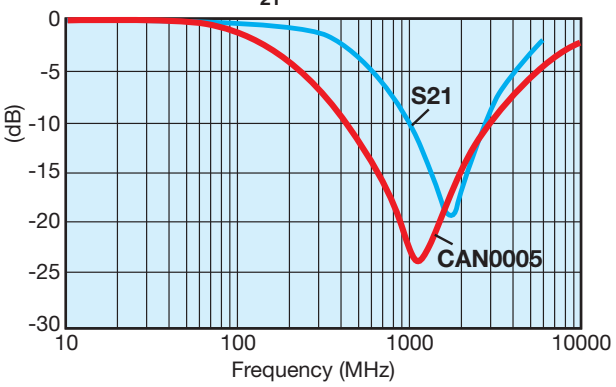
EQUIVALENT CIRCUIT MODEL

Discrete MLV Model

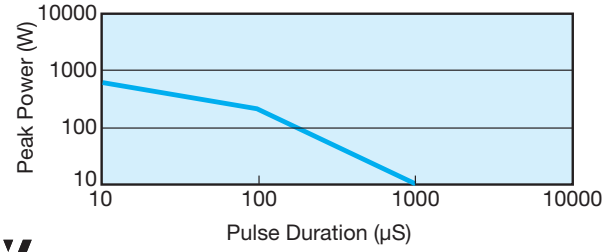


Where: R_v = Voltage Variable resistance (per VI curve)
R_p ≥ 10^{12} Ω
C = defined by voltage rating and energy level
R_{on} = turn on resistance
L_p = parallel body inductance

S_{21} Curve



Typical Pulse Rating Curve



PHYSICAL DIMENSIONS

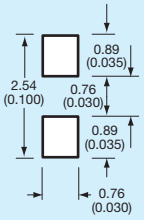
mm (inches)

	0402 Discrete	0603 Discrete	0405 Array	0612 Array
Length	1.00 ±0.10 (0.040 ±0.004)	1.60 ±0.15 (0.063 ±0.006)	1.00 ±0.15 (0.039 ±0.006)	1.60 ±0.20 (0.063 ±0.008)
Width	0.50 ±0.10 (0.020 ±0.004)	0.80 ±0.15 (0.032 ±0.006)	1.37 ±0.15 (0.054 ±0.006)	3.20 ±0.20 (0.126 ±0.008)
Thickness	0.60 Max. (0.024 Max.)	0.90 Max. (0.035 Max.)	0.66 Max. (0.026 Max.)	1.22 Max. (0.048 Max.)
Term Band Width	0.25 ±0.15 (0.010 ±0.006)	0.35 ±0.15 (0.014 ±0.006)	0.36 ±0.10 (0.014 ±0.004)	0.41 ±0.10 (0.016 ±0.010)

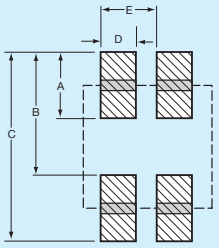
SOLDER PAD DIMENSIONS

mm (inches)

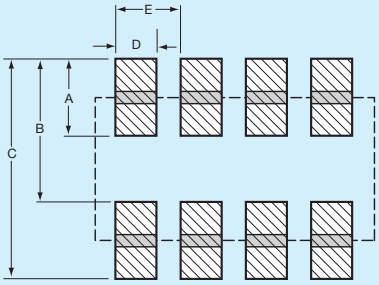
0603 Discrete



0405 Array



0612 Array



0405 Array

A	B	C	D	E
0.46 (0.018)	0.74 (0.029)	1.20 (0.047)	0.38 (0.015)	0.64 (0.025)

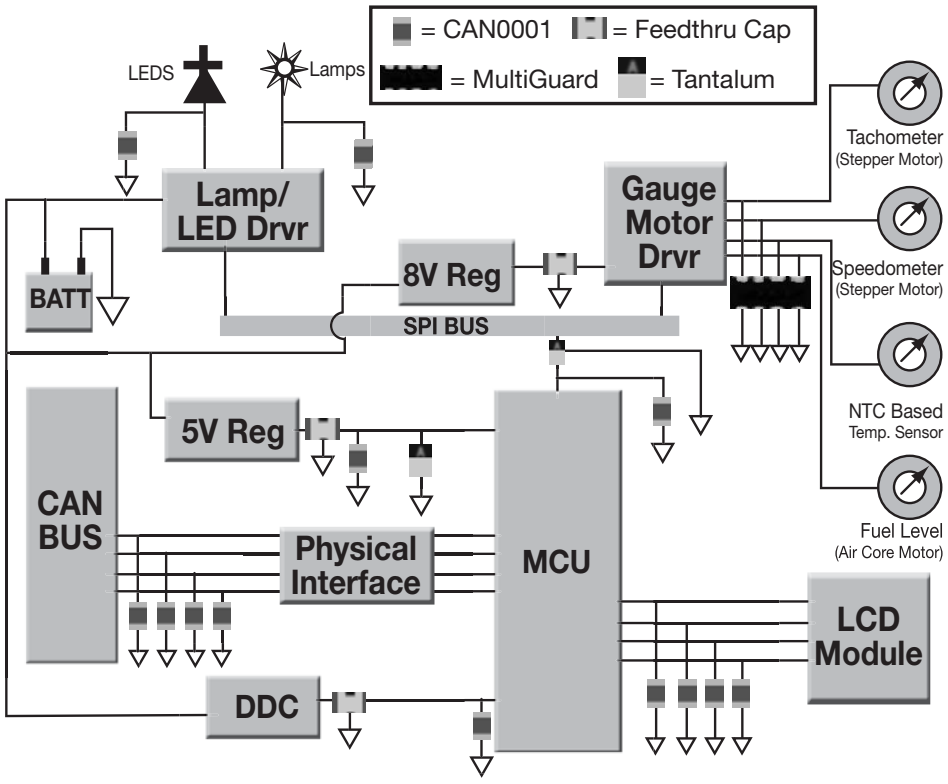
0612 Array

A	B	C	D	E
0.89 (0.035)	1.65 (0.065)	2.54 (0.100)	0.46 (0.018)	0.76 (0.030)

APPLICATION

AVX CAN BUS varistors offer significant advantages in general areas of a typical CAN network as shown on the right. Some of the advantages over diodes include:

- space savings
- higher ESD capability @ 25kV contact
- higher in rush current (4A) 8 x 20µS
- FIT rate ≤0.1 failures (per billion hours)



43