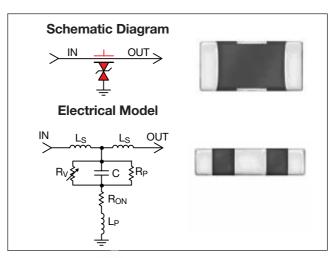


#### **GENERAL DESCRIPTION**

AVX has combined the best electrical characteristics of its TransGuard Transient Voltage Suppressors (TVS) and its Feedthru Capacitors into a single chip for state-of-the-art overvoltage circuit protection and EMI reduction over a broad range of frequencies. This unique combination of multilayer ceramic construction in a feedthru configuration gives the circuit designer a single 0805 chip that responds to transient events faster than any TVS device on the market today, and provides significant EMI attenuation when in the off-state.

The reduction in parallel inductance, typical of the feedthru chip construction when compared to the construction of standard TVS or ceramic capacitor chips, gives the TransFeed product two very important electrical advantages: (1) faster "turn-on" time. Calculated response times of <200 pSec are not unusual with this device, and measured response times range from 200 - 250 pSec. The TransFeed "turn-on" characteristic is less than half that of an equivalent TransGuard part - and TransGuards clamp transient voltages faster than any other bipolar TVS solution such as diodes; (2) the second electrical advantage of lower parallel inductance, coupled with optimal series inductance, is the enhanced attenuation characteristics of the TransFeed product. Not only is there significantly greater attenuation at a higher self-resonance frequency, but the roll-off characteristic becomes much flatter, resulting in EMI filtering over a much broader frequency spectrum. Typical applications include filtering/protection on Microcontroller I/O Lines, Interface I/O Lines, Power Line Conditioning and Power Regulation.



#### **TYPICAL APPLICATIONS**

- Fingerprint ID Circuit
- Magnetic Field Circuit
- LCD Dashboard Driver

Where designers are concerned with both transient voltage protection and EMI attenuation, either due to the electrical performance of their circuits or due to required compliance to specific EMC regulations, the TransFeed product is an ideal choice.

#### **HOW TO ORDER** F D 2 1 05 150 2 Ε P Δ γ Varistor Feedthru Voltage Varistor DC Packaging Code Capacitor Clamping Resistance 05 = 5.6 VDCPcs./Reel Voltage 1 = 0.150 Ohms 09 = 9.0 VDC150 = 18VD = 1,000 2 = 0.200 Ohms14 = 14.0VDC 200 = 22VR = 4.00018 = 18.0VDC 3 = 0.250 Ohms 300 = 32VT = 10,000400 = 42V500 = 50V**Chip Size** Feedthru **Termination Finish** No. of Energy Capacitance 2 = 0805 Elements Rating Tolerance Current P = Ni/Sn Alloy (Plated) X = 0.05JY = +100/-50% D = 500 mA 3 = 0612 M = Ni/Sn Pb (Plated) A = 0.1 JE = 750 mA C = 0.3JF = 1.0 Amp

# 

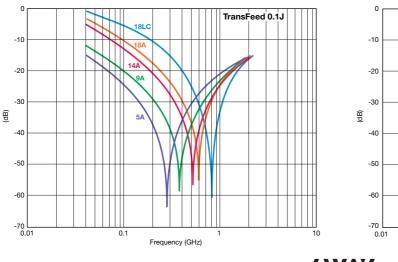


### **TRANSFEED ELECTRICAL SPECIFICATIONS (0805 CHIP SIZE)**

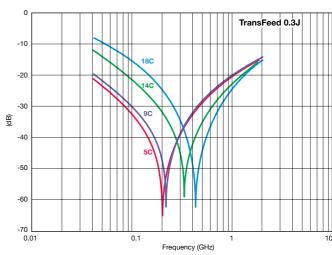
AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	DC Resistance	Maximum Feedthru Current
V2F105A150Y2E	5.6	4.0	8.5±20%	18	35	0.10	30	800	0.200	0.75
V2F105C150Y1F	5.6	4.0	8.5±20%	18	35	0.30	120	2500	0.150	1.00
V2F109A200Y2E	9.0	6.4	12.7±15%	22	25	0.10	30	575	0.200	0.75
V2F109C200Y1F	9.0	6.4	12.7±15%	22	25	0.30	120	1800	0.150	1.00
V2F114A300Y2E	14.0	10.0	18.5±12%	32	15	0.10	30	300	0.200	0.75
V2F114C300Y1F	14.0	10.0	18.5±12%	32	15	0.30	120	900	0.150	1.00
V2F118A400Y2E	18.0	13.0	25.5±10%	42	10	0.10	30	200	0.200	0.75
V2F118C400Y1F	18.0	13.0	25.5±10%	42	10	0.30	120	500	0.150	1.00
V2F118X500Y3D	18.0	13.0	25.5±10%	50	10	0.05	20	75	0.250	0.50
V3F418A400Y3G	18.0	13.0	25.5±10%	42	10	0.10	20	150	0.200	0.30
V3F418C400Y3G	18.0	13.0	25.5±10%	50	10	0.05	15	65	0.250	0.20
V3F418C400Y3G 18.0 13.0 25.5±10% 50 10 0.05 15 65 0.250 0.20   L Termination Finish Code Packaging Code										
Vw (DC) DC Working Voltage (V)   Vw (AC) AC Working Voltage (V)										

Typical Breakdown Voltage (V @ 1mAnd  $V_{\scriptscriptstyle B}$ 

- $V_{B}$  Tolerance is  $\pm$  from Typical Value  $V_{\scriptscriptstyle B}$  Tol
- Clamping Voltage (V @ 1A 8x20µS)  $V_{\rm C}$
- Maximum Leakage Current at the Working Voltage (µA) |
- Transient Energy Rating (J, 10x1000µS) Eт
- Peak Current Rating (Å, 8x20µS)  $|_{P}$
- Typical Capacitance (pF) @ 1MHz and 0.5 V Cap
- DCR DC Resistance (Ohms)
- Maximum Feedthru Current (A)  $|_{FT}$



#### dB Attenuation vs Frequency





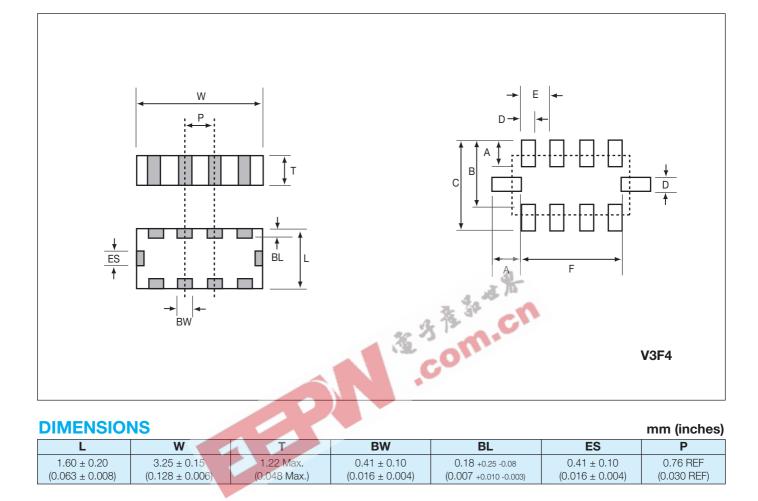


DIM	ENSIONS							mm (inches)	
	L	W	Т	BW	BL	EW	X	S	
0805	$2.01 \pm 0.20$	$1.25 \pm 0.20$	1.143 Max.	$0.46 \pm 0.10$	0.18 + 0.25 - 0.08	$0.25 \pm 0.13$	$1.02 \pm 0.10$	$0.23 \pm 0.05$	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$									
REC		DED SOLD	DER PAD		Typical Dimen	isions)	L	mm (inches) C	
	0805	3.45 (0.136)	0.51 (0.02		(0.030) 1.27 (0.0	50) 1.02	2 (0.040)	0.46 (0.018)	
			INPUT						

# **TransFeed Array - V3F4 Series**



**TVS Protection and EMI Attenuation in a 4-Element Array** 

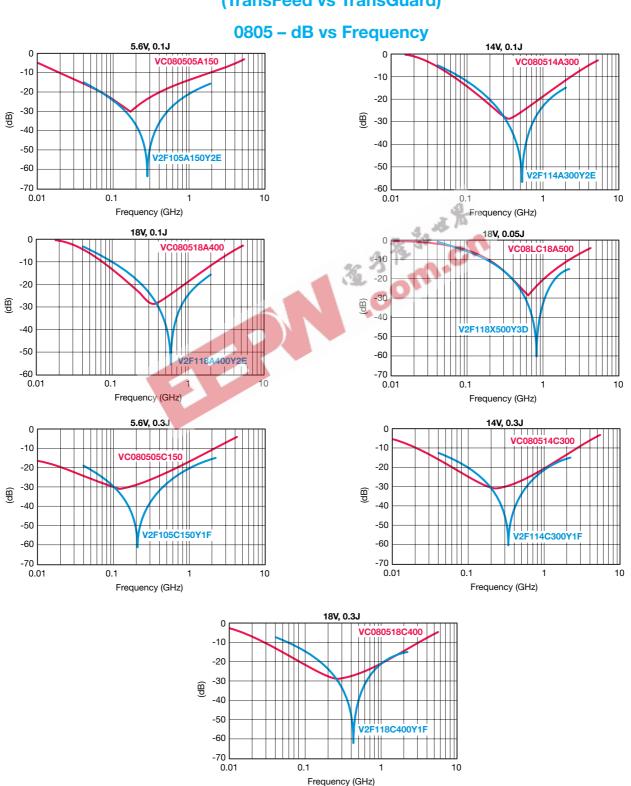


#### mm (inches)

Α	В	С	D	E	F
0.60 (0.024)	1.60 (0.064)	2.20 (0.088)	0.35 (0.014)	0.76 (0.030)	2.60 (0.104)



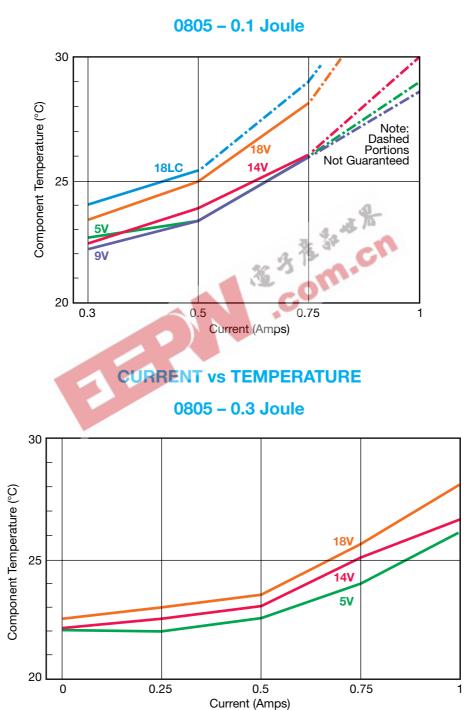
#### **PERFORMANCE CHARACTERISTICS**



#### INSERTION LOSS COMPARISON (TransFeed vs TransGuard)



#### **PERFORMANCE CHARACTERISTICS**



**CURRENT vs TEMPERATURE** 





#### **PERFORMANCE CHARACTERISTICS**

### **FEEDTHRU VARISTORS**

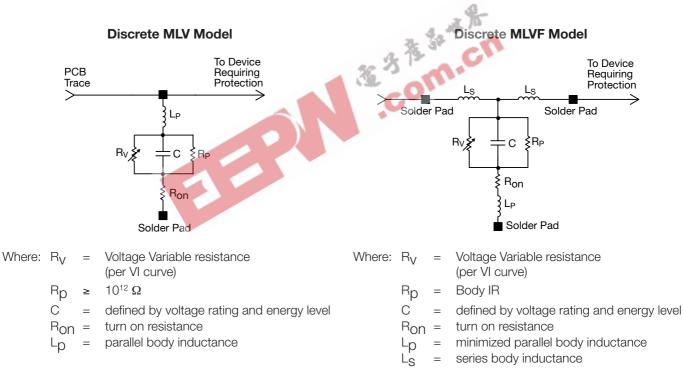
AVX Multilayer Feedthru Varistors (MLVF) are an ideal choice for system designers with transient strike and broadband EMI/RFI concerns.

Feedthru Varistors utilize a ZnO varistor material and the electrode pattern of a feedthru capacitor. This combination allows the package advantage of the feedthru and material advantages of the ZnO dielectric to be optimized.

ZnO MLV Feedthrus exhibit electrical and physical advantages over standard ZnO MLVs. Among them are:

- 1. Faster Turn on Time
- 2. Broadband EMI attenuation
- 3. Small size (relative to discrete MLV and EMI filter schemes)

The electrical model for a ZnO MLV and a ZnO Feedthru MLV are shown below. The key difference in the model for the Feedthru is a transformation in parallel to series inductance. The added series inductance helps lower the injected transient peak current (by  $2\pi$ fL) resulting in an additional benefit of a lower clamping voltage. The lowered parallel inductance decreases the turn on time for the varistor to <250ps.





#### **PERFORMANCE CHARACTERISTICS**

#### **APPLICATIONS**

- EMI Suppression
- Broadband I/O Filtering
- Vcc Line Conditioning

#### **FEATURES**

- Small Size
- Low ESR
- Ultra-fast Response Time Broad S21 Characteristics

- MARKET SEGMENTS
  - Computers
  - Automotive
  - Power Supplies
  - Multimedia Add-On Cards
  - Bar Code Scanners
  - Remote Terminals
  - Medical Instrumentation
  - Test Equipment
  - Transceivers
  - Cellular Phones / Pagers

#### **TYPICAL CIRCUITS REQUIRING TRANSIENT VOLTAGE PROTECTION AND EMI FILTERING**

The following applications and schematic diagrams show where TransFeed TVS/ EMI filtering devices might be used:

- System Board Level Interfaces: (Fig. 1) Digital to RF Analog to Digital Digital to Analog
- Voltage Regulation (Fig. 2)
- Power Conversion Circuits (Fig. 3)

Fig. 2 - Voltage Regulators

REGULATOR

Fig. 3 - Power Conversion Circuits/Power Switching Circuits

• GaAs FET Protection (Fig. 4)

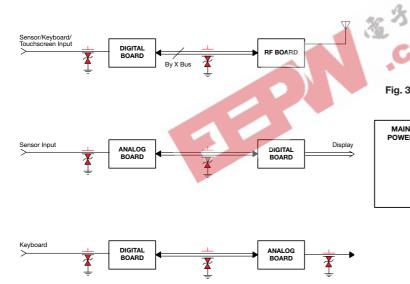


Fig. 1 – System Interface

#### SPECIFICATION COMPARISON

MLVF 0805		PARAMETER	MLV 0805	
5ph	Ls	typical	N/A	
<600nh	Lp	typical	<1.5nh	
<0.025Ω	Ron	typical	<0.1Ω	
100pf to 2.5nf	С	typical	100pf to 5.5nf	
see VI curves	Rv	typical	see VI curves	
>0.25 x 10 <sup>12</sup> Ω	Rp	typical	>1 x 10 <sup>12</sup> Ω	
<250ps	Typical turn on time Typical frequency response		<500ps	

A comparison table showing typical element parameters and resulting performance features for MLV and MLVF is shown above.

