

## VSIP® TVS ARRAY

### APPLICATIONS

- ✓ RS-232 and RS-423 Data Lines
- ✓ Telecommunications T/R Protection: ISDN, ADSL, V.34/V.90, HDLC, T1/E1 & T3/E3
- ✓ Low & High Speed Data Lines: Ethernet, Token Ring, USB & FireWire
- ✓ I/O Port Protection

### IEC COMPATIBILITY (EN61000-4)

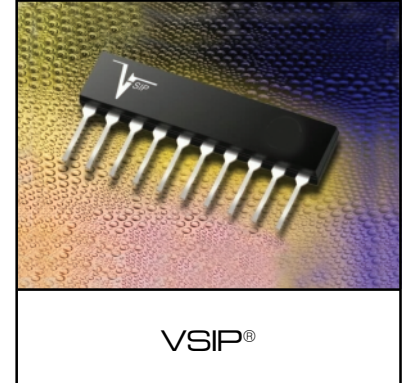
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 24A, 8/20µs - Level 2(Line-Gnd) & Level 3(Line-Line)

### FEATURES

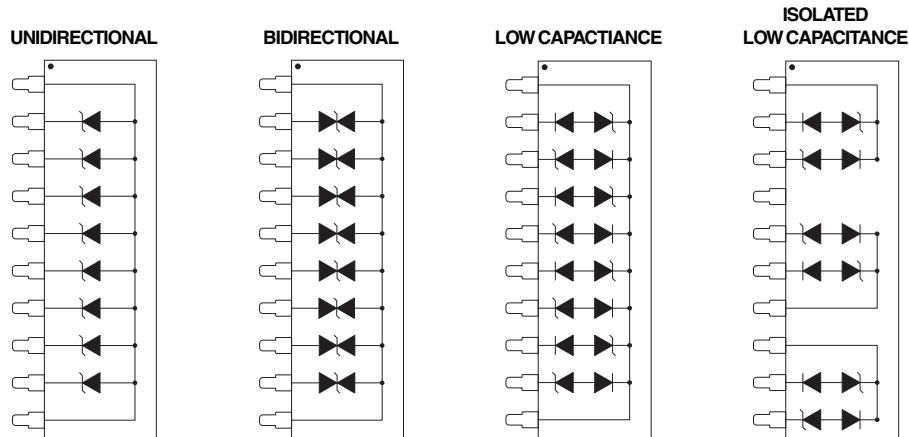
- ✓ Series A: 800 Watts Peak Pulse Power per Line (tp=8/20µs)
- ✓ Series B: 3,400 Watts Peak Pulse Power per Line (tp=8/20µs)
- ✓ ESD Protection > 40 kilovolts
- ✓ High Surge Capability & Low Capacitance Option
- ✓ Protects 8 to 9 Bidirectional Data Lines
- ✓ Available in 5 Voltages Types Ranging from 5V to 24V

### MECHANICAL CHARACTERISTICS

- ✓ Molded Plastic VSIP® Package
- ✓ Weight 1.5 grams (Approximate)
- ✓ Flammability rating UL 94V-0
- ✓ Marking: Logo, Part Number, Date Code & Pin One Defined By Dot on Top of Package



### PIN CONFIGURATIONS



## DEVICE CHARACTERISTICS

### MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER                                                      | SYMBOL    | VALUE          | UNITS |
|----------------------------------------------------------------|-----------|----------------|-------|
| Series A Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1 | $P_{PP}$  | 800            | Watts |
| Series B Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1 | $P_{PP}$  | 3400           | Watts |
| Operating Temperature                                          | $T_J$     | -55°C to 150°C | °C    |
| Storage Temperature                                            | $T_{STG}$ | -55°C to 150°C | °C    |

### ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| RATED<br>STAND-OFF<br>VOLTAGE<br>(See Notes 1-3)<br><br>$V_{WM}$<br>VOLTS | MINIMUM<br>BREAKDOWN<br>VOLTAGE<br><br>@ 1mA<br>$V_{BR}$<br>VOLTS | SERIES A                                                                             |                                                                                       |                                                                  |                                                                          | SERIES B                                                                             |                                                                                       |                                                                  |                                                                          |
|---------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
|                                                                           |                                                                   | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(See Fig. 2)<br><br>@ $I_P = 1A$<br>$V_C$<br>VOLTS | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(See Fig. 2)<br><br>@ $I_P = 10A$<br>$V_C$<br>VOLTS | MAXIMUM<br>LEAKAGE<br>CURRENT<br><br>@ $V_{WM}$<br>$I_D$<br>AMPS | MAXIMUM<br>PEAK PULSE<br>CURRENT<br>(See Fig. 2)<br><br>$I_{PP}$<br>AMPS | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(See Fig. 2)<br><br>@ $I_P = 1A$<br>$V_C$<br>VOLTS | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>(See Fig. 2)<br><br>@ $I_P = 10A$<br>$V_C$<br>VOLTS | MAXIMUM<br>LEAKAGE<br>CURRENT<br><br>@ $V_{WM}$<br>$I_D$<br>AMPS | MAXIMUM<br>PEAK PULSE<br>CURRENT<br>(See Fig. 2)<br><br>$I_{PP}$<br>AMPS |
| 5.0                                                                       | 6.0                                                               | 9.8                                                                                  | 12.5                                                                                  | 100                                                              | 45                                                                       | 8.6                                                                                  | 9.1                                                                                   | 300                                                              | 300                                                                      |
| 8.0                                                                       | 8.5                                                               | 13.4                                                                                 | 16.6                                                                                  | 10                                                               | 40                                                                       | 10.9                                                                                 | 12.0                                                                                  | 200                                                              | 258                                                                      |
| 12.0                                                                      | 13.3                                                              | 19.5                                                                                 | 22.7                                                                                  | 1                                                                | 34                                                                       | 17.0                                                                                 | 18.8                                                                                  | 2                                                                | 184                                                                      |
| 15.0                                                                      | 16.7                                                              | 24.4                                                                                 | 28.5                                                                                  | 1                                                                | 27                                                                       | 21.4                                                                                 | 23.6                                                                                  | 2                                                                | 147                                                                      |
| 24.0                                                                      | 26.7                                                              | 39.1                                                                                 | 45.6                                                                                  | 1                                                                | 22                                                                       | 34.2                                                                                 | 37.8                                                                                  | 2                                                                | 93                                                                       |

**Note 1:** For voltage types not shown on the product data sheet, consult the factory.

**Note 2:** The low capacitance configuration values for each bidirectional line pair is as follows:

Series "A" C = 25pF      Series "B" C = 100pF

**Note 3:** Forward voltage (*unidirectional configurations only*):

Series "A":  $V_F = 1.5V$  @ 200mA      Series "B":  $V_F = 1.5V$  200mA

### STANDARD PRODUCT ORDERING BY PART NUMBER

Unidirectional - VS10Pxx (A Series), VSB10Pxx (B Series)

Bidirectional - VS10PxxC (A Series), VSB10PxxC (B Series)

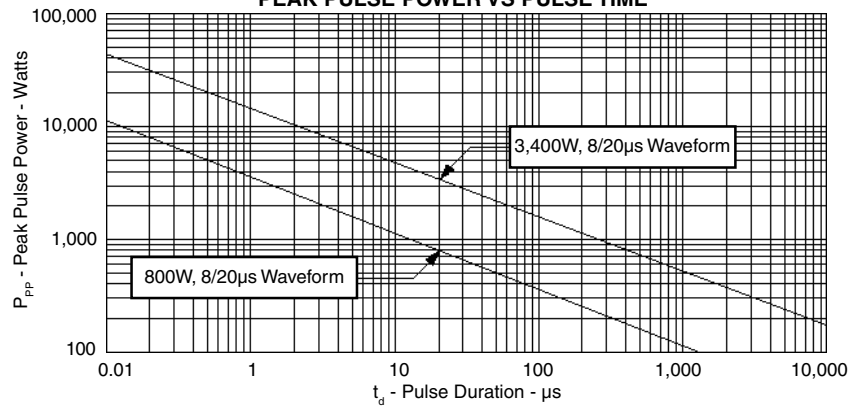
Low Capacitance - VS10PxxLC (A Series), VSB10PxxLC (B Series)

Isolated Low Capacitance- VS10PxxLCI (A Series), VSB10PxxLCI (B Series)

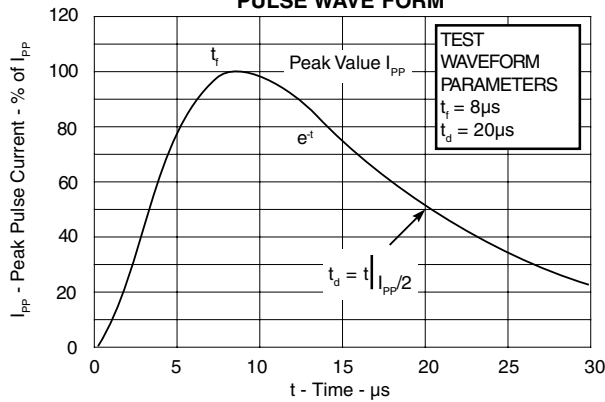
xx = Selected Voltage

GRAPHS

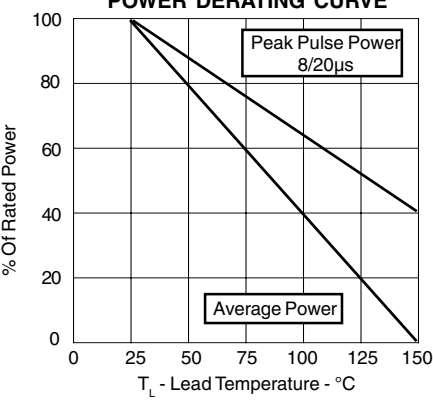
**FIGURE 1**  
**PEAK PULSE POWER VS PULSE TIME**



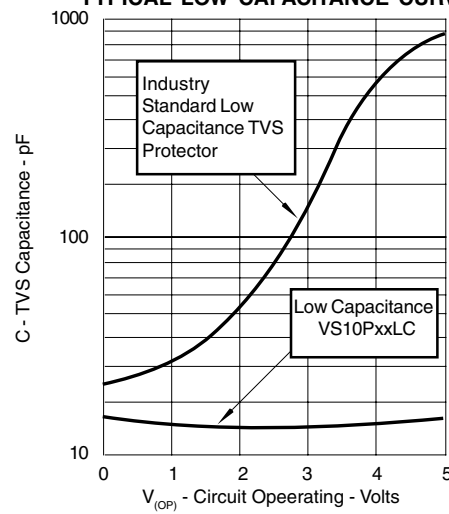
**FIGURE 2**  
**PULSE WAVE FORM**



**FIGURE 3**  
**POWER DERATING CURVE**

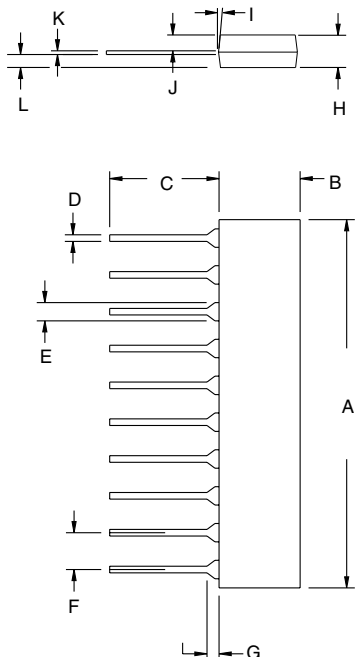


**FIGURE 4**  
**TYPICAL LOW CAPACITANCE CURVE**

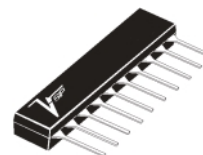


## PACKAGE OUTLINE & DIMENSIONS

### PACKAGE OUTLINE



### VSIP® PACKAGE



### VSIP DIMENSIONS

| DIM | MILLIMETERS |        | INCHES |        |
|-----|-------------|--------|--------|--------|
|     | MIN         | MAX    | MIN    | MAX    |
| A   | 25.81       | 26.01  | 1.016  | 1.024  |
| B   | 6.25        | 6.45   | 0.246  | 0.254  |
| C   | 5.92        | 6.02   | 0.233  | 0.237  |
| D   | 0.406       | 0.508  | 0.016  | 0.020  |
| E   | 1.47        | 1.57   | 0.058  | 0.062  |
| F   | 2.49        | 2.59   | 0.098  | 0.102  |
| G   | 0.38        | 1.02   | 0.015  | 0.040  |
| H   | 3.20        | 3.40   | 0.126  | 0.134  |
| I   | 7° TYP      | 7° TYP | 7° TYP | 7° TYP |
| J   | 1.47        | 1.57   | 0.058  | 0.062  |
| K   | 0.20        | 0.30   | 0.008  | 0.012  |
| L   | 1.47        | 1.57   | 0.058  | 0.062  |

#### NOTES

1. Dimensions are exclusive of mold flash and metal burrs.

#### BULK ORDERING NOMENCLATURE

1. Product Shipped in Tubes of 18 pcs per Tube.

**Outline & Dimensions: Rev 1 - 11/01, 06016**

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