

BIDIRECTIONAL MONOLITHIC TVS DIODE ARRAY

APPLICATIONS

- RS-232, RS-422 & RS-423 Data Lines
- Industrial & Instrumentation Equipment
- Board Level Interface Protection
- I/O Port Protection

FEATURES

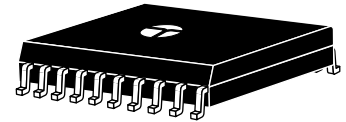
- IEC 1000-4-2, -4 & -5 Industry Requirements
- 1,500 Watts Peak Pulse Power Dissipation per Line (8/20 μ s)
- Low Inductance, Crosstalk & Low Overshoot Voltage
- ESD Protection > 40 kilovolts
- Available in 4 Voltage Types Ranging from 5.0V to 24V
- Up to 9 Bidirectional Data Lines of Protection
- Externally Low Clamping Voltage
- Bidirectional Monolithic Design
- UL 94V-0 Flammability Classification

DESCRIPTION

The SM20MTxxC family is a series of bidirectional, monolithic, silicon transient voltage suppressor (TVS) arrays designed to provide protection against ESD and EFT. The SM20MTxxC surface mount series is designed to protect up to nine (9) bidirectional I/O ports against IEC 1000-4-2, -4, -5 requirements and specifically for RS-232 and RS-423. This device provides a low clamping voltage at a high surge current of 40 Amps based on an 8/20 waveshape and 1,500 Watts per line peak pulse power (P_{PP}) rating for an 8/20 μ s waveshape. When subjected to fast rise time transient events such as ESD and EFT, the SM20MTxxC series yields a low overshoot voltage with a minimum lead inductance.

The SM20MTxxC series has a low inductance package consisting of a 4-point structure with isolated input to output pins that eliminates overshoot voltage due to external lead attachments and perturbations caused by parasitic inductances. This unique internal design provides protection against very high (di/dt) rates such as ESD. Considered an in-line protection device, the monolithic chip design and internal construction ensures reliable protection against the very fast transient overvoltage ESD events, such as Human Body Model (HBM), Machine Model (MM), and Charge Device Model (CDM).

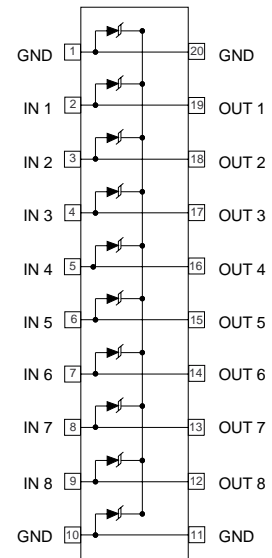
IEC 1000-4 COMPATIBLE



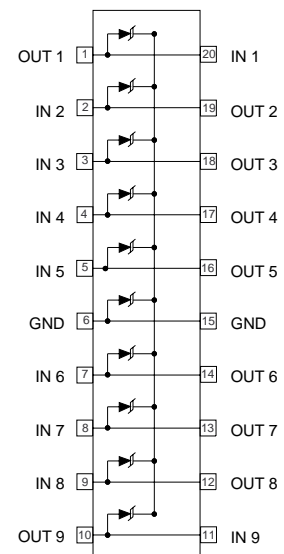
SO-20L PACKAGE

CIRCUIT DIAGRAMS

EQUAL TO 8 BIDIRECTIONAL TVS DEVICES



EQUAL TO 9 BIDIRECTIONAL TVS DEVICES



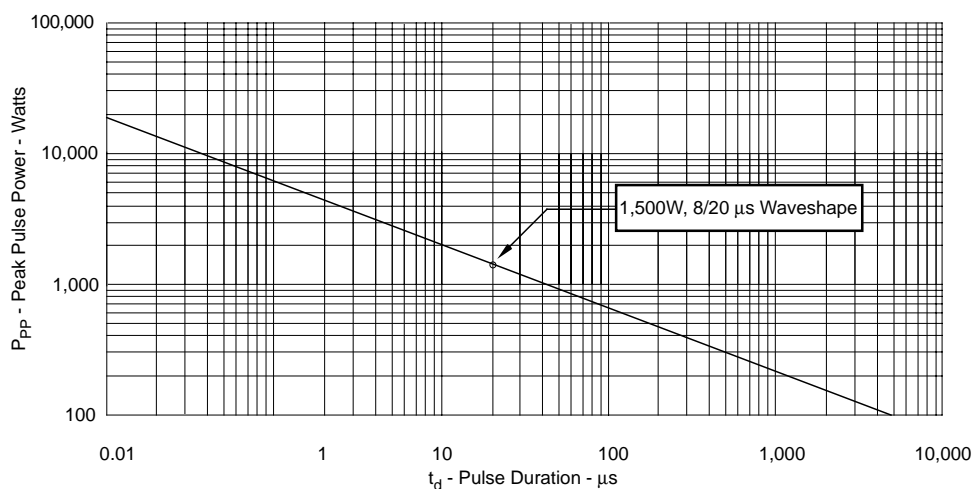
MAXIMUM RATINGS	
P_{PP} @ 25°C (See Figure 1)	1,500 Watts per Line, 8/20 μ s Waveshape
Operating & Storage Temperature	-55° to +150°C
Repetition Rate (Duty Cycle)	0.01%
$t_{Clamping}$ (0 Volts to $V_{(BR)}$ Min.)	Bidirectional: < 10 x 10 ⁻⁹ seconds
MECHANICAL CHARACTERISTICS	
Package	Molded SO-20L Wide Body Surface Mount Package
Packaging	Tube or 24mm Tape per EIA 481
Approximate Weight	0.5 grams
Device Markings	Logo & Part Number
Miscellaneous	Pin No. 1 Indicated by Dot on Top of Package

ELECTRICAL CHARACTERISTICS @ 25° C Ambient Temperature

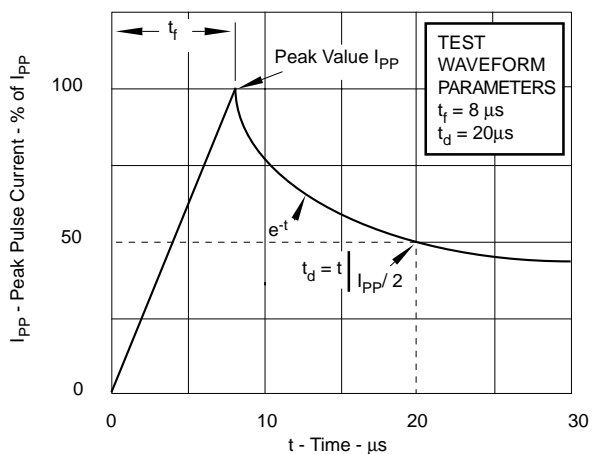
PROTEK PART NUMBER (See Note 1)	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1 mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_P = 10$ A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_P = 25$ A V_C VOLTS	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA	TYPICAL CAPACITANCE @ 1 MHz, V_{WM} C pF
SM20MT05C	5.0	6.5	9.5	11	50	700
SM20MT08C	8.0	10	13	17	10	360
SM20MT15C	15.0	18	23	26	4	250
SM20MT24C	24.0	25	31	36	4	140

Note 1: These devices are bidirectional only. Electrical characteristics apply in both directions. The monolithic TVS array is based on 10 unidirectional P/N junctions with a common cathode and can be configured to offer 8 to 9 bidirectional data lines of protection. The inputs and outputs are symmetrical and can be reversed for specific application layout requirements.

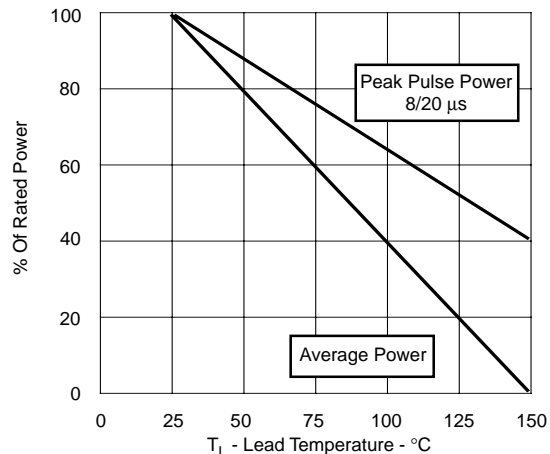
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



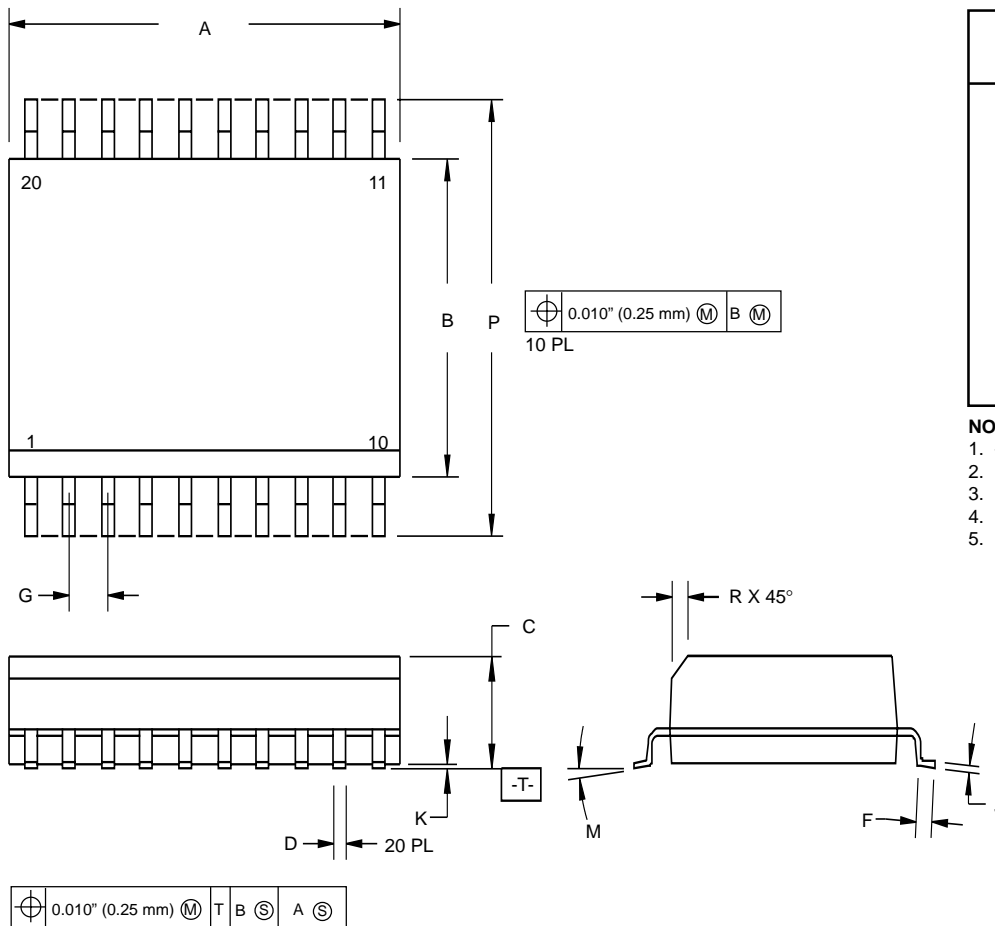
**FIGURE 2
PULSE WAVE FORM**



**FIGURE 3
POWER DERATING CURVE**



SO-20L PACKAGE OUTLINE



SO-20L PACKAGE DIMENSIONS (WIDE BODY)

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.65	12.95	0.499	0.510
B	7.40	7.60	0.292	0.299
C	2.35	2.65	0.093	0.104
D	0.35	0.49	0.014	0.019
F	0.50	0.90	0.020	0.035
G	1.27 BSC	1.27 BSC	0.05 BSC	0.05 BSC
J	0.25	0.32	0.010	0.012
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	10.05	10.55	0.395	0.415
	0.25	0.75	0.010	0.029

NOTES:

1. - T - = Seating Plane
2. Dimension "A" is Datum
3. Dimension "A" and "B" do not include mold protrusion.
4. Maximum mold protrusion is 0.15" (0.006 mm).
5. Dimensioning and tolerances per ANSI Y14.5M, 1982.

