

Small Signal Product

**FEATURES**

- Meet IEC61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 8\text{kV}$  (contact)
- Meet IEC61000-4-4 (EFT) rating. 40A (5/50 $\mu\text{s}$ )
- Meet IEC61000-4-5 (Lightning) rating. 2A (8/20 $\mu\text{s}$ )
- Protects four high speed I/O lines
- Working Voltage : 5V
- Pb free version, RoHS compliant, and Halogen free

**MECHANICAL DATA**

Case : SOT-26 standard package, molded plastic

Terminal : Matte tin plated, lead free, solderable

per MIL-STD-202, Method 202 guaranteed

Moisture sensitivity: level 1, per J-STD-020

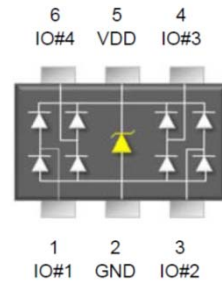
Molding compound flammability rating : UL 94V-0

Weight : 16 mg (approximately)

Marking Code : V05



**SOT-26**



**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power (tp=8/20 $\mu\text{s}$ waveform)	P <sub>PP</sub>	300	W
Peak Pulse Current (tp = 8/20 $\mu\text{s}$ )	I <sub>PP</sub>	2	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	$\pm 15$	KV
ESD per IEC 61000-4-2 (Contact)		$\pm 8$	
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to + 150	°C

Parameter	Symbol	Min	Max	Units
Reverse Stand-Off Voltage	V <sub>RWM</sub>	-	5	V
Reverse Breakdown Voltage	V <sub>(BR)</sub>	6	-	V
Reverse Leakage Current	I <sub>R</sub>	-	1	$\mu\text{A}$
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A	12.5	V
		I <sub>PP</sub> = 2 A	25	
Junction Capacitance	C <sub>J</sub>	1.2 (Typ.)		pF

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**Rating and Characteristics Curves**

Fig. 1 Non-Repetitive Peak Pulse Power VS. Pulse Time

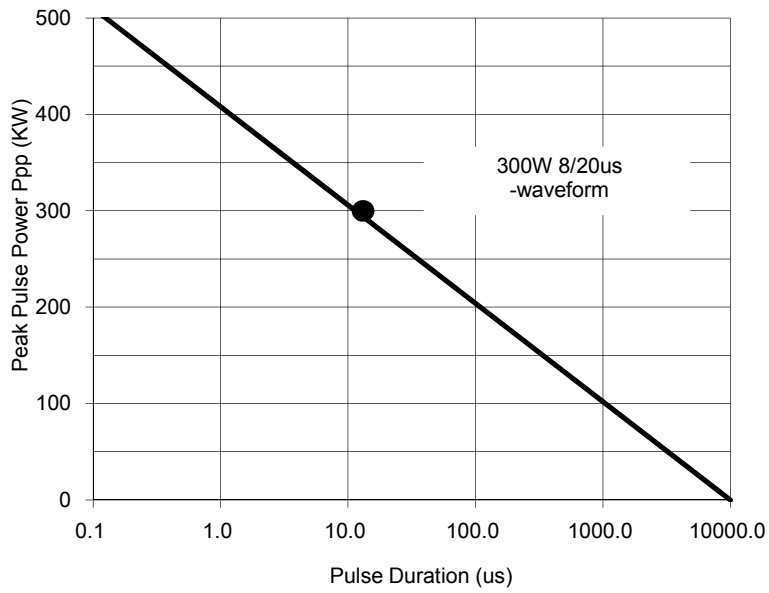


Fig. 2 Pulse Waveform

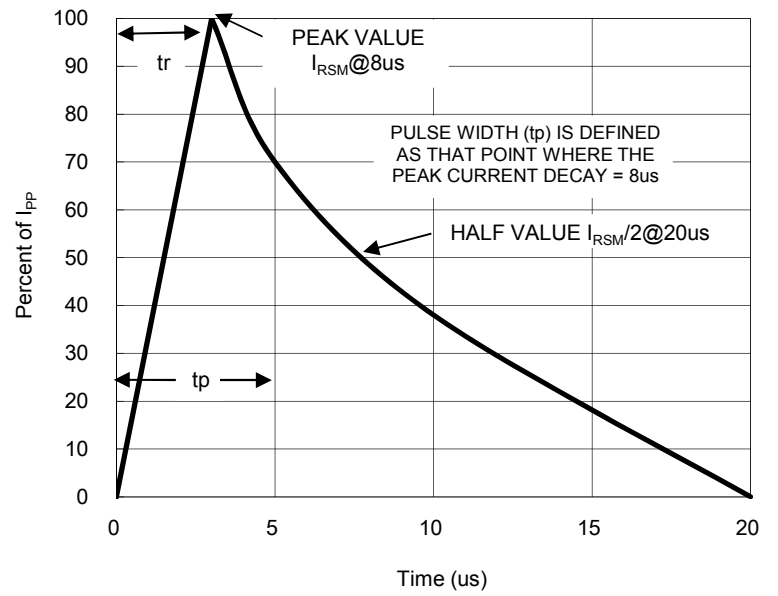


Fig.3 Admissible Power Dissipation Curve

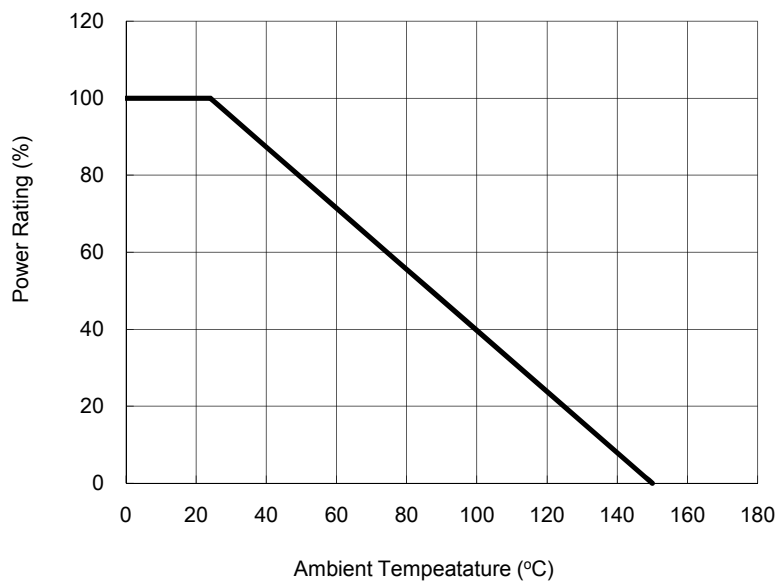


Fig. 4 Typical Junction Capacitance

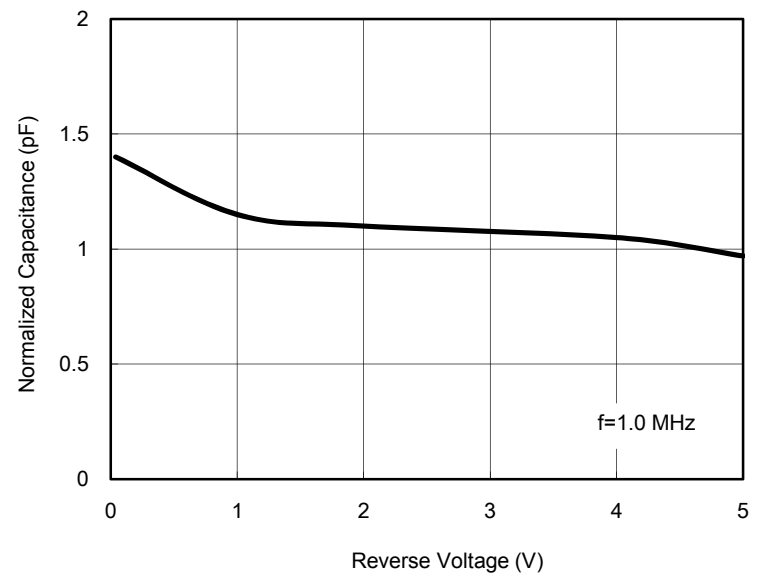
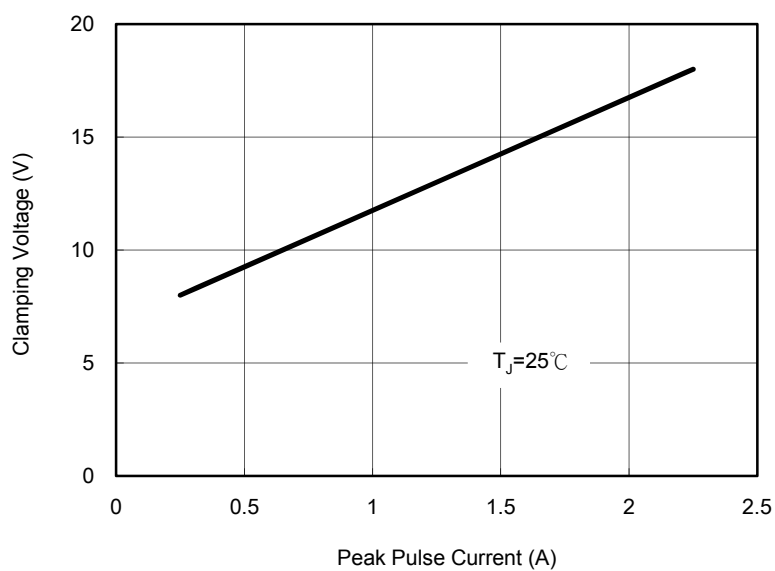


Fig. 5 Clamping Voltage VS. Peak Pulse Current



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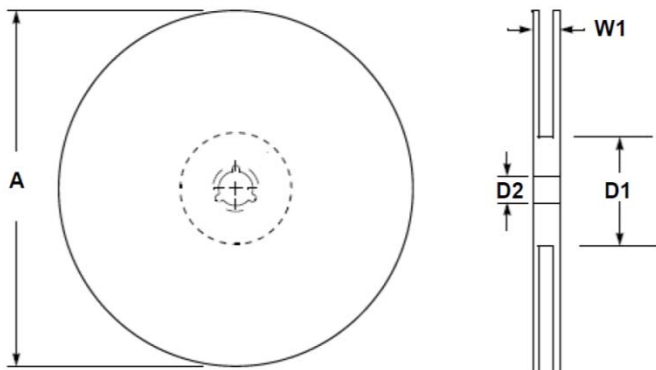
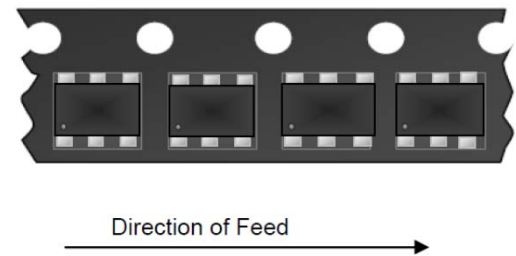
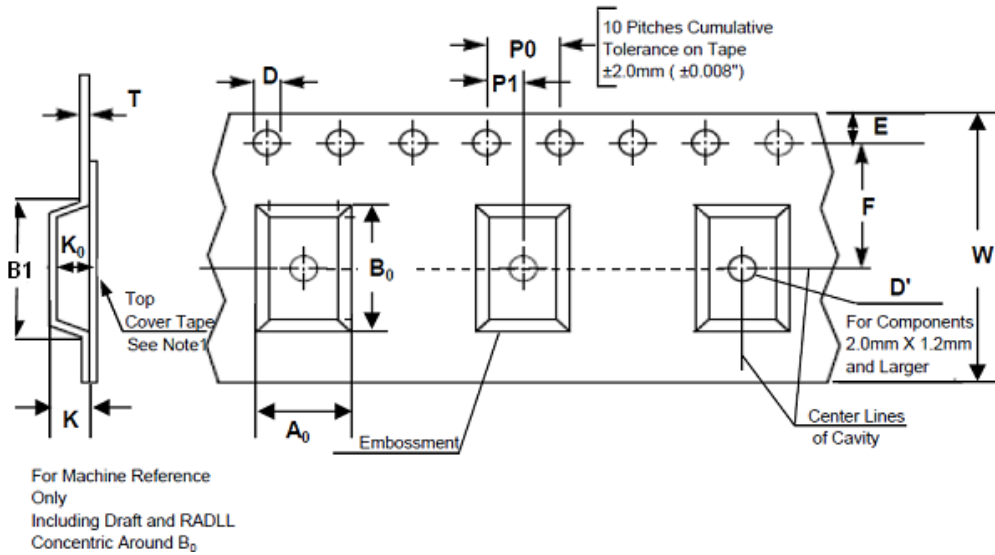
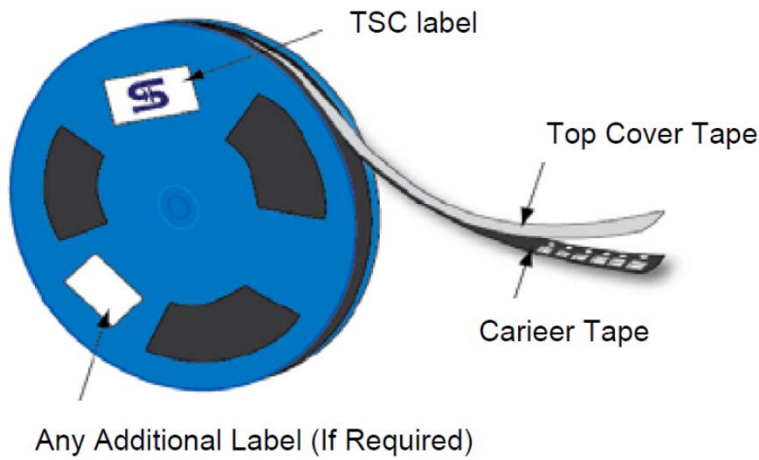
### Ordering information (example)

Part No.	Package	Packing	Packing code	Packing code (Green)	Marking	Manufacture code
TESDS5V0A	SOT-26	3K / 7" Reel	RF	RFG	V05	(Note)
TESDS5V0A	SOT-26	3K / 7" Reel	RF	RFG	V05	
TESDS5V0A	SOT-26	3K / 7" Reel	RF	RFG	V05	E0

Note : Manufacture special control, if empty means no special control requirement.

### Tape & Reel specification

Item	Symbol	Dimension(mm)
Carrier depth	K	1.22 Max.
Sprocket hole	D	1.50 ±0.10
Reel outside diameter	A	180 ± 1
Reel inner diameter	D1	50 Min.
Feed hole width	D2	13.0 ± 0.5
Sprocket hole position	E	1.75 ±0.10
Sprocket hole pitch	P0	4.00 ±0.10
Embossment center	P1	2.00 ±0.10
Overall tape thickness	T	0.6 Max.
Tape width	W	8.30 Max.
Reel width	W1	14.4 Max.

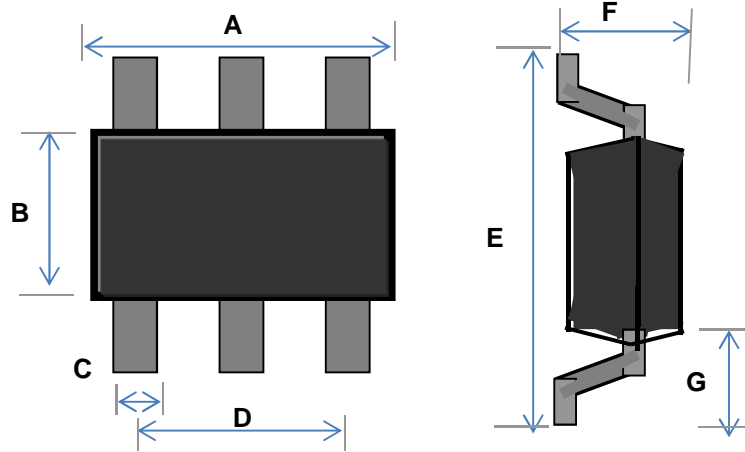


Note 1 :  $A_0$ ,  $B_0$ , and  $K_0$  are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min. to 0.5 mm max. The component cannot rotate more than  $10^\circ$  within the determined cavity.

Note 2 : If  $B_1$  exceeds 4.2 mm(0.165") for 8 mm embossed tape, the tape may not feed through all tape feeders.

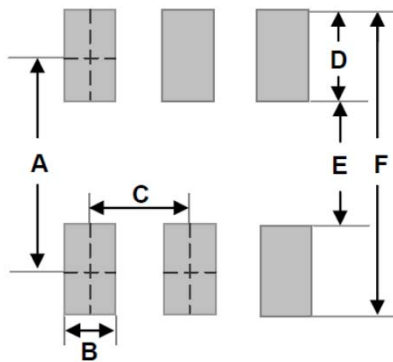
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### Dimensions



DIM.	Unit(mm)		Unit(inch)	
	Min	Max	Min	Max
A	2.800	3.100	0.110	0.122
B	1.500	1.750	0.059	0.069
C	0.250	0.500	0.010	0.020
D	1.800	2.000	0.071	0.079
E	2.650	2.950	0.104	0.116
F	0.900	1.450	0.035	0.057
G	0.475	0.725	0.019	0.029

### Suggested PAD Layout



DIM.	Unit(mm)	Unit(inch)
	Typ.	Typ.
A	0.098	2.50
B	0.024	0.60
C	0.037	0.95
D	0.043	1.10
E	0.055	1.40
F	0.142	3.60

Note : The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application.

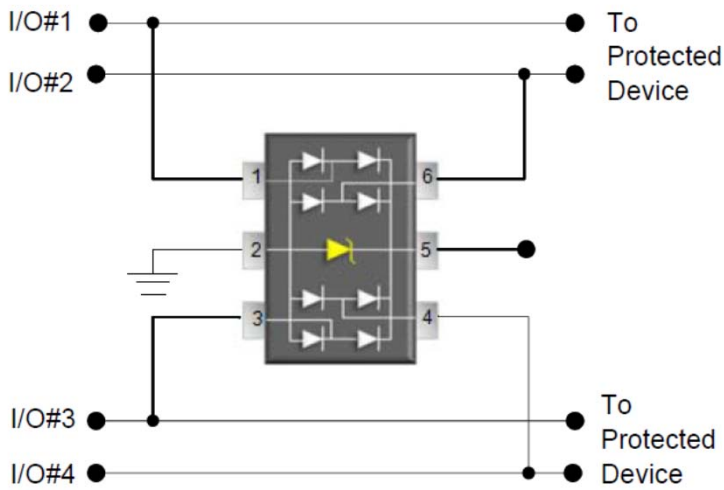
### Applications Information

- ◇ Designed to protect high speed data interfaces
- ◇ Designed to protect four data lines from transient over-voltages by clamping them to a fixed reference
- ◇ Designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by electrostatic discharge (ESD), electrical fast transients (EFT), and lightning.
- ◇ TESDS5V0A incorporates eight surge rated, low capacitance steering diodes and a TVS diode in a single package
- ◇ During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground
- ◇ The internal TVS diode prevents over-voltage on the power line, protecting any downstream components

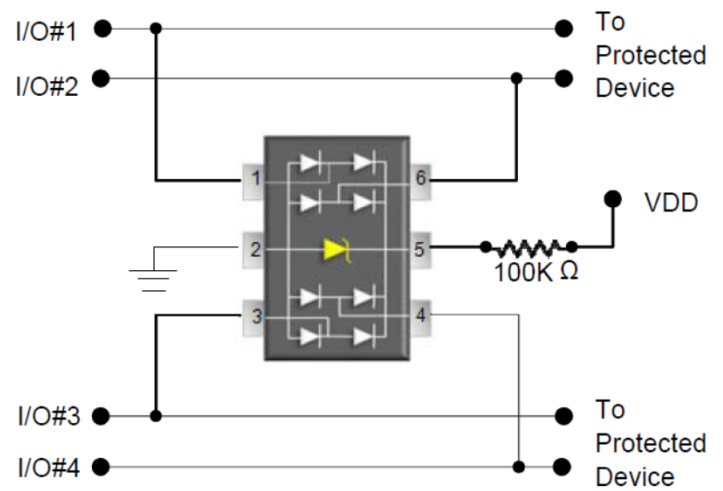
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### Circuit Board Layout Recommendations

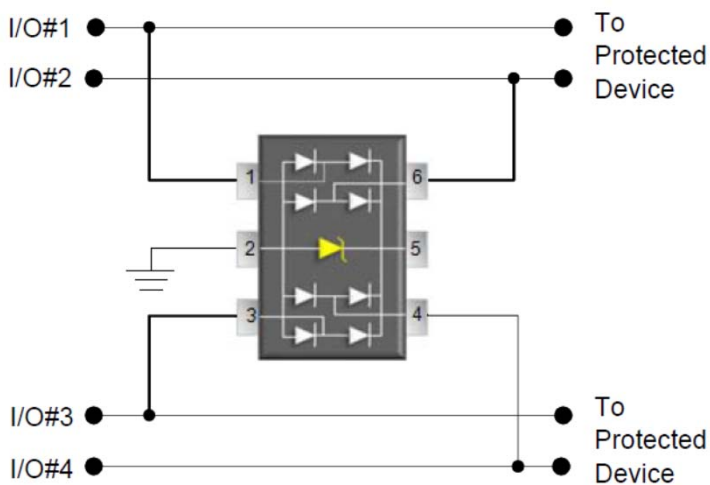
- ◇ To protect data lines and the power line, connect pin 5 directly to the VDD. In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail.
- ◇ The TESDS5V0A can be isolated from the power supply by adding a series resistor between pin 5 and VDD. A value of 100kΩ is recommended. The internal TVS and steering diodes remain biased, providing the advantage of lower capacitance.
- ◇ In applications where no positive supply reference is available, or complete supply isolation is desired, the internal TVS may be used as the reference. In this case, pin 5 is not connected. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working voltage of the TVS (plus one diode drop).



Data Line and Power Supply Protection Using Vcc as reference



Data Line Protection with Bias and Power Supply Isolation



Data Line Protection Using Internal TVS Diode as Reference