

Small Signal Product

## Steering Diode Structure ESD Protection Array

### FEATURES

- Meet IEC61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 8\text{kV}$  (contact)
- Meet IEC61000-4-4 (EFT) rating, 40A (5/50ns)
- Protects two directional I/O lines
- Working voltage: 5V
- Pb free version and RoHS compliant
- Packing code with suffix "G" means green compound (halogen-free)

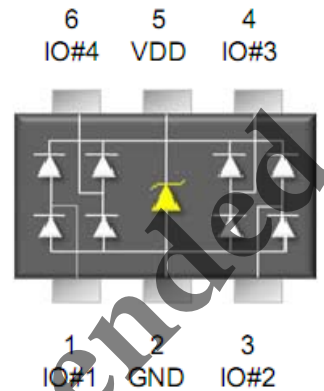


SOT-363



### MECHANICAL DATA

- Case: SOT-363 small outline plastic package
- Terminal: Matte tin plated, lead free., solderable per MIL-STD-202, Method 208 guaranteed
- Molding compound flammability Rating : UL 94V-0
- High temperature soldering guaranteed :  $260^{\circ}\text{C}/10\text{s}$
- Weight:  $8 \pm 0.5 \text{ mg}$
- Marking code: B54



### APPLICATIONS

- USB Power & Data Line Protection
- Notebooks, Desktops, Servers and Video Graphics Cards
- Monitors and Flat Panel Displays
- Portable Instrumentation
- Set Top Box

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak Pulse Power (tp=8/20 $\mu\text{s}$ waveform)	$P_{PP}$	150	W
Peak Pulse Current (tp=8/20 $\mu\text{s}$ )	$I_{PP}$	3	A
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$	$\pm 15$	KV
ESD per IEC 61000-4-2 (Contact)		$\pm 8$	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

PARAMETER	SYMBOL	MIN	MAX	UNIT
Reverse Stand-Off Voltage	$V_{RWM}$	-	5	V
Reverse Breakdown Voltage	$V_{(BR)}$	6	-	V
Reverse Leakage Current	$I_R$	-	1	$\mu\text{A}$
Clamping Voltage	$V_C$	-	15	V
		-	25	
Junction Capacitance	$C_J$	2		pF

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RATINGS AND CHARACTERISTICS CURVES

( $T_A=25^\circ\text{C}$  unless otherwise noted)

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

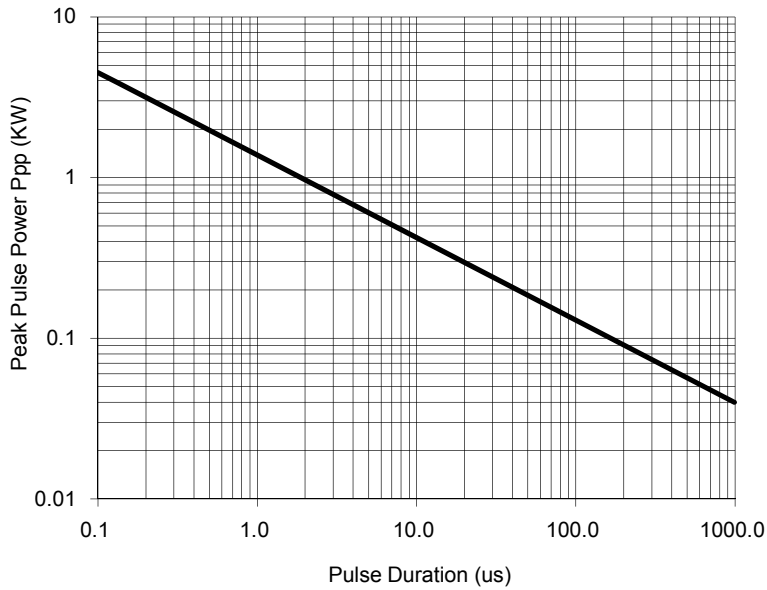


Fig. 2 Pulse Waveform

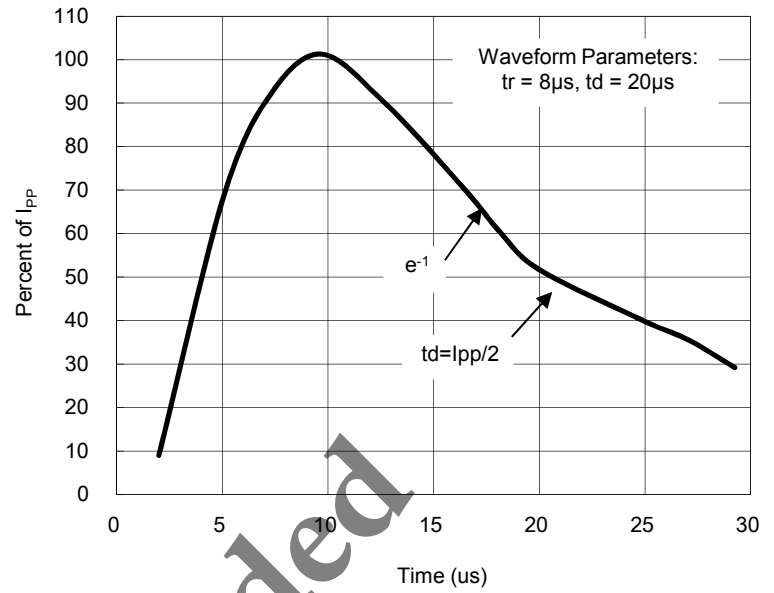


Fig.3 Admissible Power Dissipation Curve

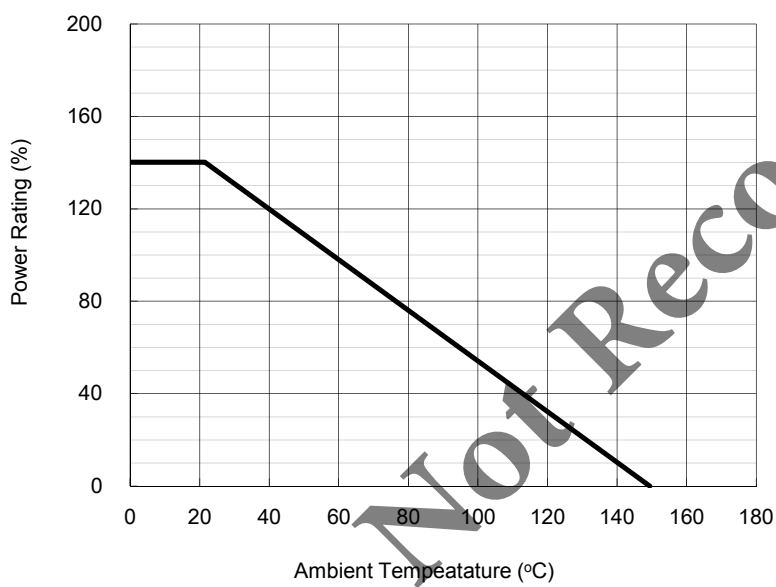


Fig. 4 Typical Junction Capacitance

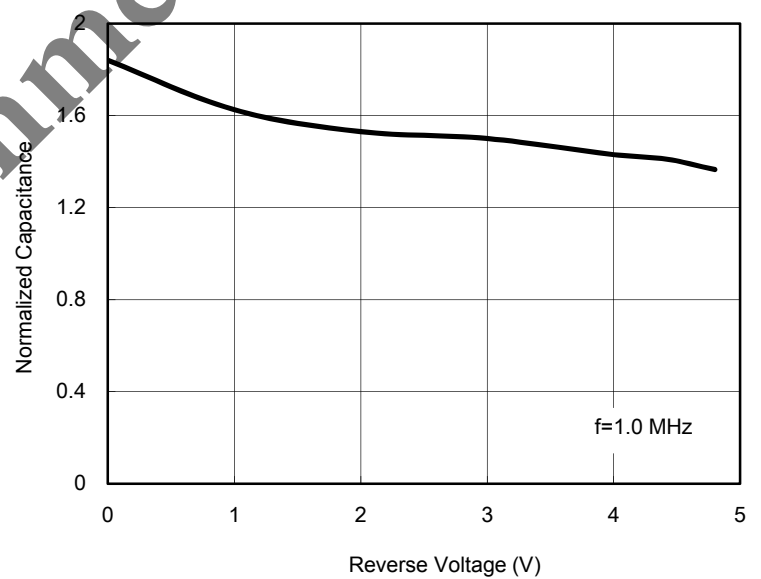
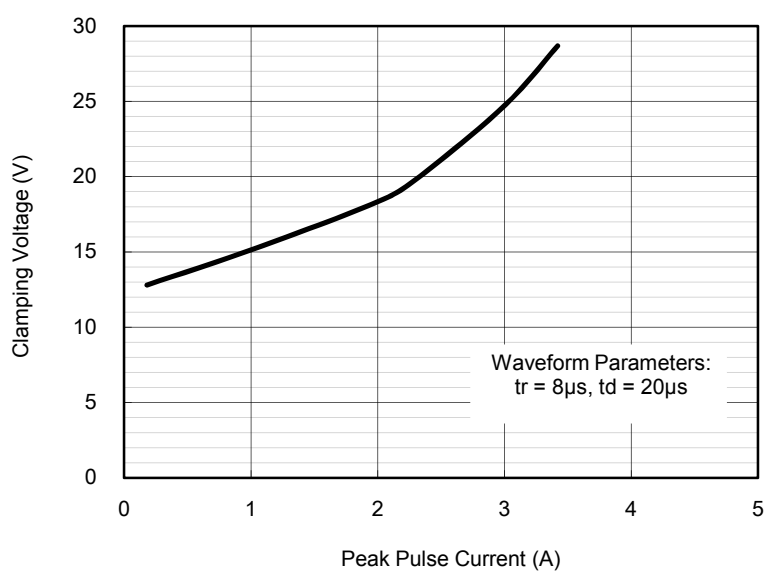


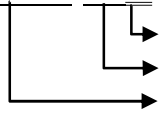
Fig. 5 Clamping Voltage VS. Peak Pulse Current



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ORDER INFORMATION (EXAMPLE)

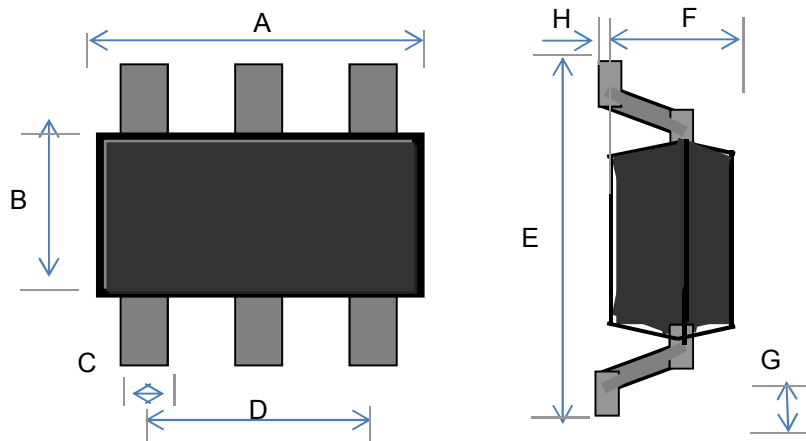
TESDV5V0A RFG



Green compound code  
Packing code  
Part no.

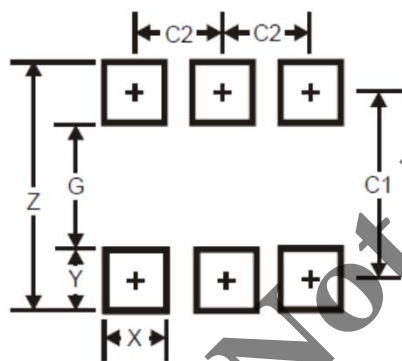
PACKAGE OUTLINE DIMENSIONS

**SOT-363**



DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.15	0.35	0.006	0.014
D	1.20	1.40	0.047	0.055
E	2.15	2.45	0.085	0.096
F	0.85	1.05	0.033	0.041
G	0.25	0.46	0.010	0.018
H	0.00	0.10	0.000	0.004

SUGGEST PAD LAYOUT



DIM.	Unit (mm)	Unit (inch)
	Typ.	Typ.
Z	3.20	0.126
G	1.60	0.063
X	0.55	0.022
Y	0.80	0.031
C1	2.40	0.094
C2	0.95	0.037

Note: 1. The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application.

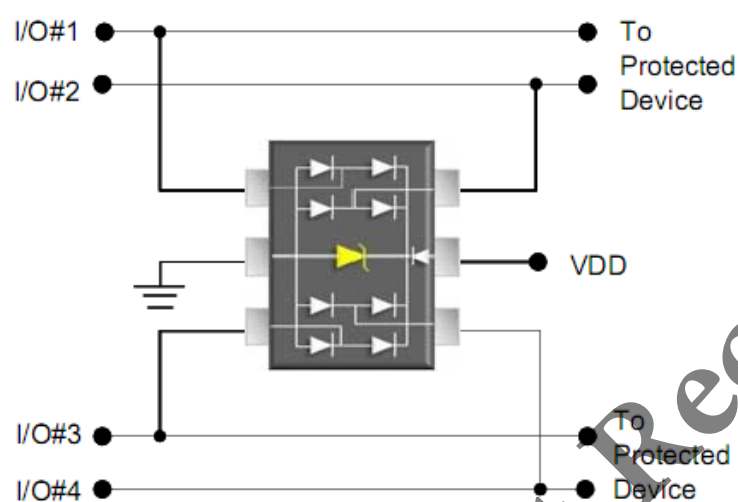
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APPLICATIONS INFORMATION

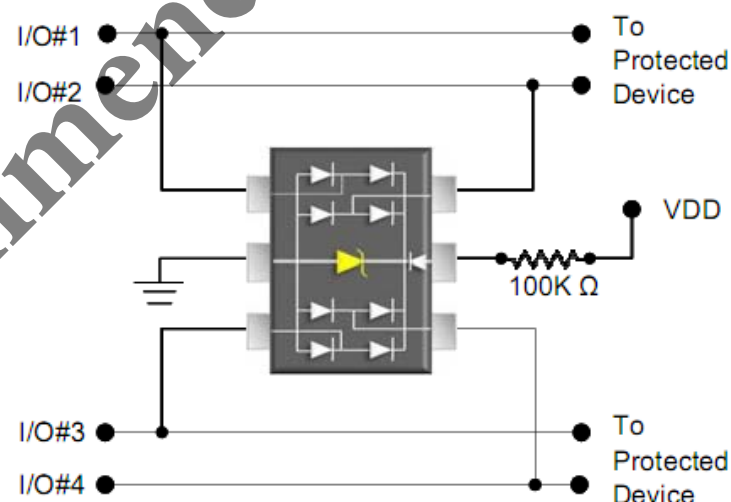
- ◇ Designed to protect high speed data interfaces
- ◇ Designed to protect four data lines from transient over-voltages by clamping them to a fixed reference
- ◇ Designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by electrostatic discharge (ESD), electrical fast transients (EFT), and lightning.
- ◇ TESDV5V0A 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

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

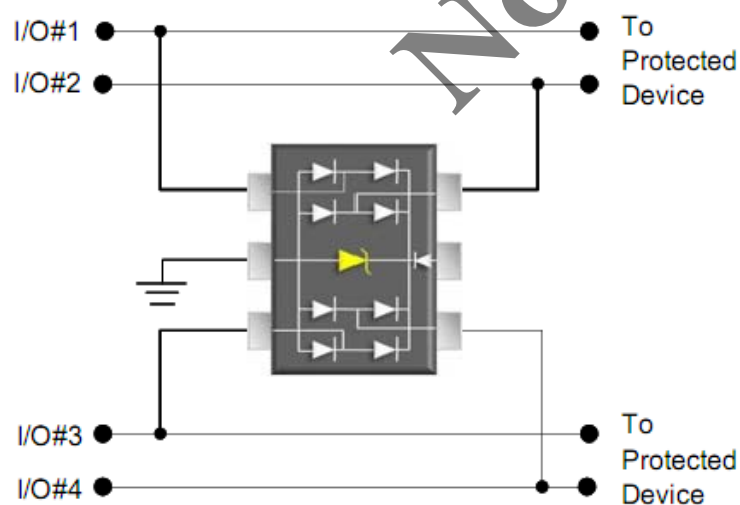
- ◇ To protect data lines and the power line, connect pin 5 directly to the VDD. In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail.
- ◇ The TESDV5V0A can be isolated from the power supply by adding a series resistor 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

**Not Recommended**

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