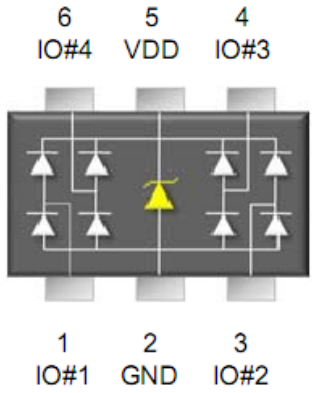
# Steering Diode Structure ESD Protection Array

## FEATURES

- Meet IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- Meet IEC61000-4-4 (EFT) rating. 40A (5/50ns)
- Meet IEC61000-4-5 (Lightning) rating. 2A (8/20μs)
- Protects four directional I/O lines
- Working voltage: 5V
- Pb free version and RoHS compliant
- Packing code with suffix "G" means green compound (halogen-free)



**SOT-26**




Pb-Free

RoHS COMPLIANT

## MECHANICAL DATA

- Case: SOT-26 small outline plastic package
- Terminal: Matte tin plated, lead free., solderable per MIL-STD-202, Method 208 guaranteed
- Moisture sensitivity: level 1, per J-STD-020
- High temperature soldering guaranteed : 260°C/10s
- Weight: 16 ± 0.5 mg
- Marking code: V05

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)**

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Peak Pulse Power (tp=8/20μs waveform) | $P_{PP}$ | 300 | W |
| Peak Pulse Current (tp=8/20μs) | $I_{PP}$ | 2 | A |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | ± 15<br>± 8 | KV |
| Junction and Storage Temperature Range | $T_J$ , $T_{STG}$ | -55 to +150 | °C |

| PARAMETER | | SYMBOL | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| Reverse Stand-Off Voltage | | $V_{RWM}$ | - | 5 | V |
| Reverse Breakdown Voltage | $I_R$ = 1 mA | $V_{(BR)}$ | 6 | - | V |
| Reverse Leakage Current | $V_R$ = 5 V | $I_R$ | - | 1 | μA |
| Clamping Voltage | $I_{PP}$ = 1 A | $V_C$ | - | 12.5 | V |
| | $I_{PP}$ = 2 A | | - | 25 | |
| Junction Capacitance | $V_R$ = 0 V , f = 1.0 MHz | $C_J$ | 1.2 | | pF |

## RATINGS AND CHARACTERISTICS CURVES

($T_A$=25°C unless otherwise noted)

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

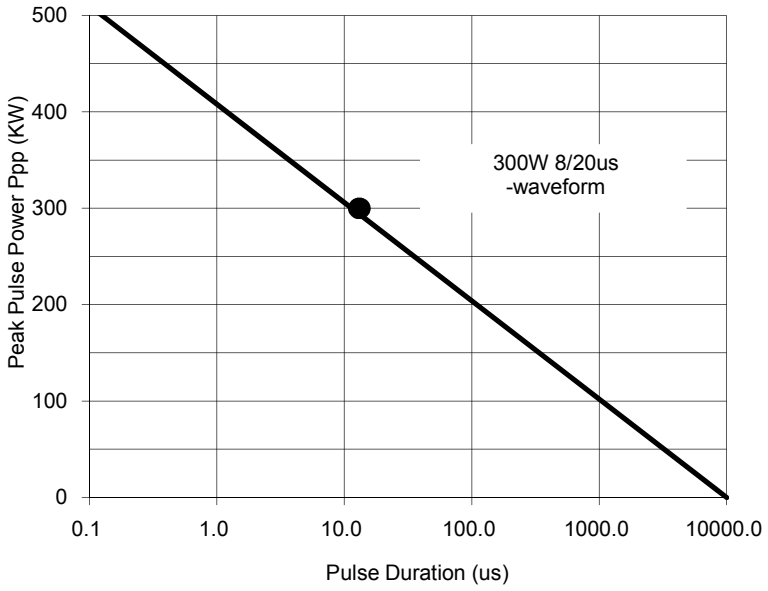
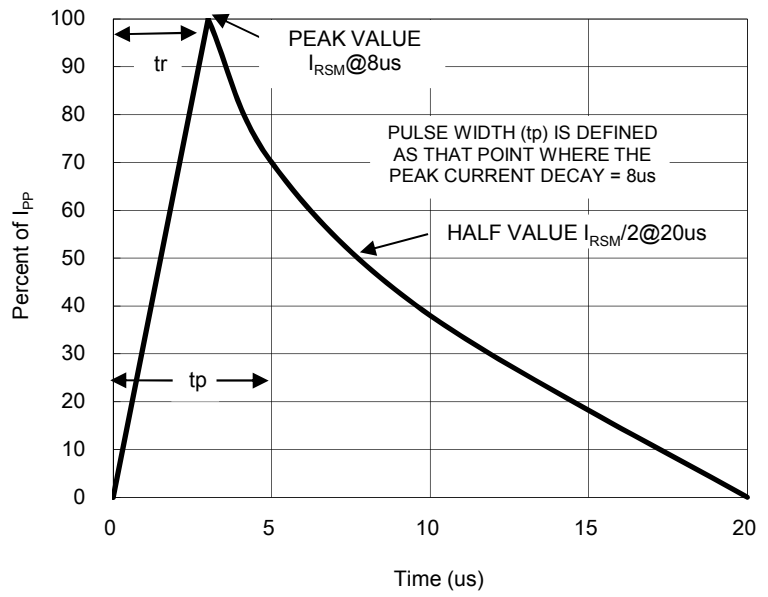



Fig. 2 Pulse Waveform




Fiig.3 Admissible Power Dissipation Curve




Fig. 4 Typical Junction Capacitance




Fig. 5 Clamping Voltage VS. Peak Pulse Current

Small Signal Product

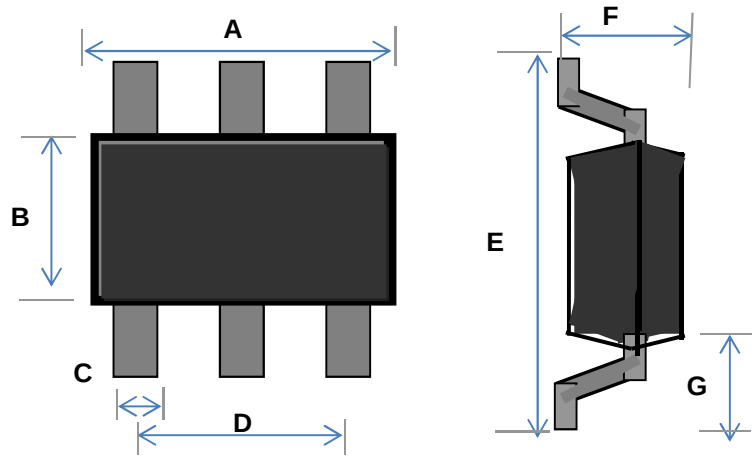
## ORDER INFORMATION (EXAMPLE)

TESDS5V0A RFG

- Green compound code
- Packing code
- Part no.

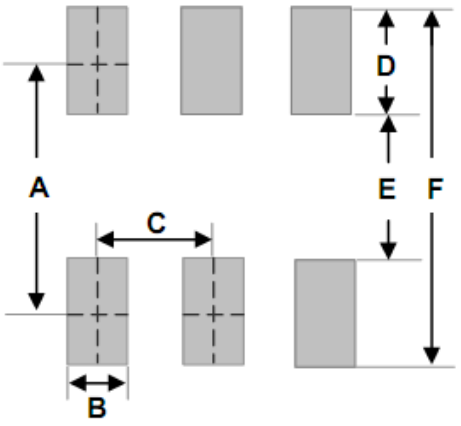
## PACKAGE OUTLINE DIMENSIONS

**SOT-26**




| 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 |

## SUGGEST PAD LAYOUT




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

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

## APPLICATIONS INFORMATION

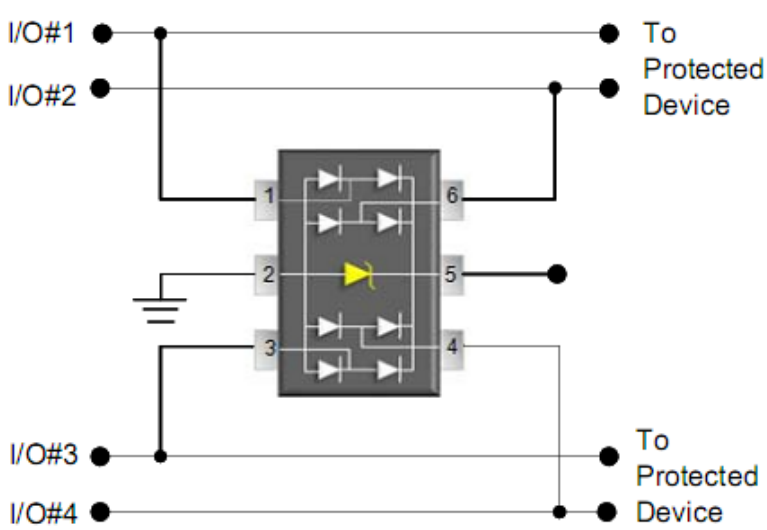
◇ Designed to protect high speed data interfaces
◇ Designed to protect four data lines from transient over-voltages by clamping them to a fixed reference
◇ Designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by electrostatic discharge (ESD),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

## CIRCUIT BOARD LAYOUT RECOMMENDATIONS

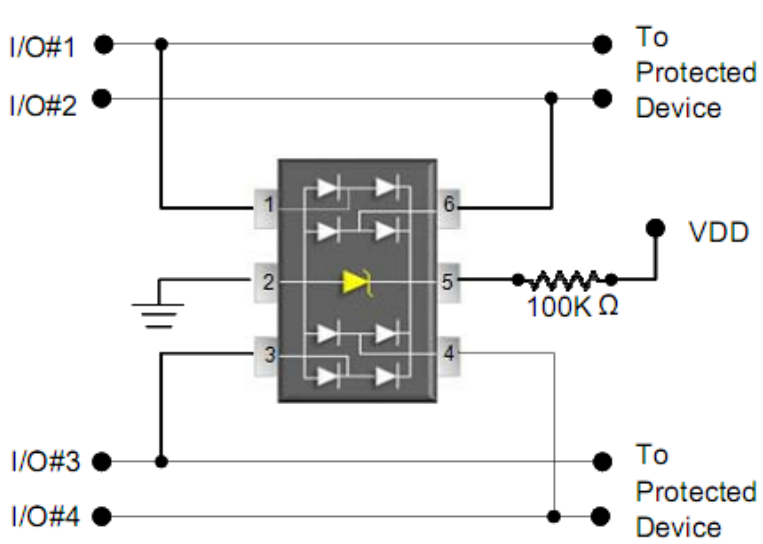
◇ To protect data lines and the power line, connect pin 5 directly to the VDD. In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail.

◇ 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.

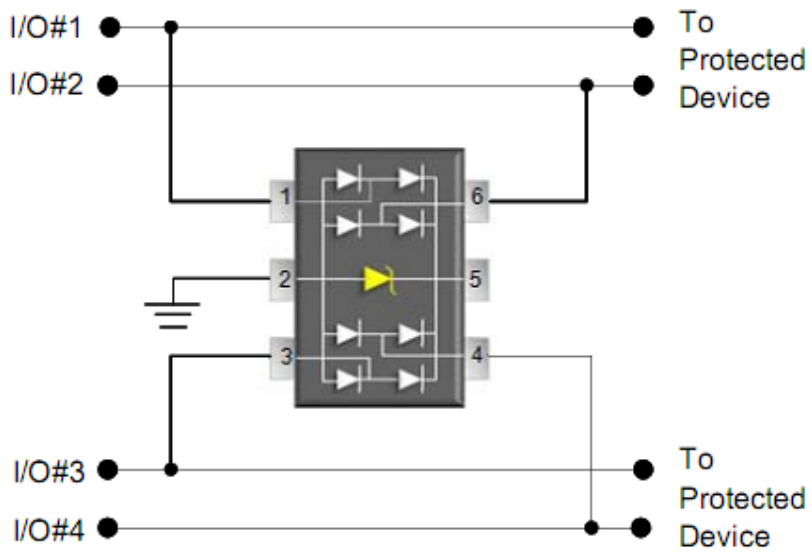
◇ In applications where no positive supply reference is available, or complete supply isolation is desired, the internal TVS may be used as the reference. In this case, pin 5 is not connected. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working voltage 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

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