

Product Summary

| V_{BR} (Min) | I_{PP} (Max) | $C_{I/O}$ (Typ) |
|----------------|----------------|-----------------|
| 4.5V | 45A | 2.1pF |

Description

The D5V0P4UR6SO is a high-performance device suitable for protecting four high-speed I/Os. These devices are assembled in SOT26 package and have high ESD surge capability and low capacitance.

Applications

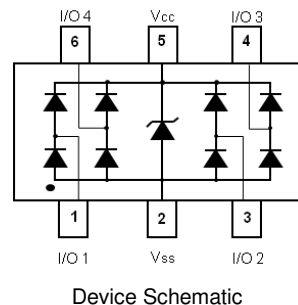
Typically used at high-speed ports such as USB 2.0, IEEE1394 (FireWire®, iLink), Serial ATA, DVI™, HDMI™ and PCI™.

Features

- Low Clamping Voltage: Typical 7.5V at 12A 100ns, TLP, I/O to Vss; Typical 5.8V at 12A 100ns, TLP, Vcc to Vss
- IEC 61000-4-2 (ESD): Air – ±30kV, Contact – ±30kV
- IEC 61000-4-4 (EFT): ±80A (5/50ns)
- IEC 61000-4-5 (Lighting): 20A, I/O to Vss; 45A, Vcc to Vss
- TLP Dynamic Resistance: 0.15Ω, I/O to Vss; 0.07Ω, Vcc to Vss
- Low Channel Input Capacitance of 2.1pF Typical
- 4 Channels of ESD Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: SOT26
- Package Material: Molded Plastic, “Green” Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals – Finish – Matte Tin Pleated Leadframe.
Solderable per MIL-STD-202, Method 208 (G3)
- Weight: 0.016 grams (Approximate)



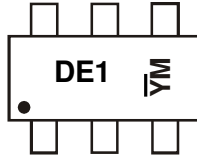
Ordering Information (Note 4)

| Part Number | Compliance | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|---------------|------------|---------|---------|--------------------|-----------------|---------|-------------|
| | | | | | | Qty. | Carrier |
| D5V0P4UR6SO-7 | Standard | SOT26 | DE1 | 7 | 8 | 3,000 | Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

FireWire is a registered trademark of Apple Computer, Inc.

Marking Information



DE1 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: J = 2022)
 M = Month (ex: 2 = February)
 Note: "—" Represents Internal Code

Date Code Key

| Year | 2016 | ... | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | D | ... | J | K | L | M | N | O | P | R | S | T |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Conditions |
|---|-----------------------------------|-------------|------|---|
| Peak Pulse Current, per IEC 61000-4-5 | I _{PP} | 20 | A | I/O to V _{SS} , 8/20μs |
| Peak Pulse Current, per IEC 61000-4-5 | I _{PP} | 45 | A | V _{CC} to V _{SS} , 8/20μs |
| Peak Pulse Power, per IEC 61000-4-5 | P _{PP} | 180 | W | I/O to V _{SS} , 8/20μs |
| Operating Supply Voltage (DC) | V _{DC} | 3.6 | V | V _{CC} to V _{SS} |
| ESD Protection – Contact Discharge, per IEC 61000-4-2 | V _{ESD_CONTACT} | ±30 | kV | I/O to V _{SS} , V _{CC} to V _{SS} |
| ESD Protection – Air Discharge, per IEC 61000-4-2 | V _{ESD_AIR} | ±30 | kV | I/O to V _{SS} , V _{CC} to V _{SS} |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C | — |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Power Dissipation Typical (Note 5) | P _D | 300 | mW |
| Thermal Resistance, Junction to Ambient Typical (Note 5) | R _{θJA} | 417 | °C/W |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|----------------------|-----|------|-----|------|--|
| Reverse Working Voltage | V _{RWM} | — | — | 3.3 | V | V _{CC} to V _{SS} |
| Reverse Leakage Current (Note 6) | I _{LEAK} | — | — | 5 | μA | V _{CC} = 3.3V, V _{CC} to V _{SS} |
| Channel Leakage Current (Note 6) | I _{CH-LEAK} | — | — | 1 | μA | V _{I/O} = 3.3V, I/O to V _{SS} |
| Reverse Breakdown Voltage | V _{BR} | 4.5 | — | 7 | V | I _{BR} = 1mA, V _{CC} to V _{SS} |
| Forward Clamping Voltage | V _F | — | 0.8 | 1.2 | V | I _F = 15mA, V _{SS} to V _{CC} |
| Reverse Clamping Voltage (Note 7) | V _{C_5A} | — | 6 | — | V | I _{PP} = 5A, I/O to V _{SS} , 8/20μs |
| | | — | 4.8 | — | V | I _{PP} = 5A, V _{CC} to V _{SS} , 8/20μs |
| ESD Clamping Voltage | V _{ESD} | — | 7.5 | — | V | TLP, 12A, t _P = 100ns, I/O to V _{SS} |
| | | — | 5.8 | — | | TLP, 12A, t _P = 100ns, V _{CC} to V _{SS} |
| Dynamic Resistance | R _{DIF} | — | 0.15 | — | Ω | TLP, 12A, t _P = 100ns, I/O to V _{SS} |
| | | — | 0.07 | — | | TLP, 12A, t _P = 100ns, V _{CC} to V _{SS} |
| Channel Input Capacitance | C _{I/O} | — | 2.1 | 2.5 | pF | V _{I/O} = 1.65V, V _{CC} = 3.3V, f = 1MHz |
| | | — | 2.4 | 3.0 | | V _{I/O} = 1.65V, V _{CC} = floated, f = 1MHz |
| Variation of Channel Input Capacitance | ΔC _{I/O} | — | 0.05 | — | pF | V _{SS} = 0V, I/O = 1.65V, V _{CC} = 3.3V, f = 1MHz, I/O _x to V _{SS} – I/O _y to V _{SS} |
| | | — | 0.04 | — | | V _{SS} = 0V, I/O = 1.65V, V _{CC} = floated, f = 1MHz, I/O _x to V _{SS} – I/O _y to V _{SS} |

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's website at <http://www.diodes.com/package-outlines.html>.
 6. Short duration pulse test used to minimize self-heating effect.
 7. Clamping voltage value is based on an 8x20μs peak pulse current (I_{PP}) waveform.

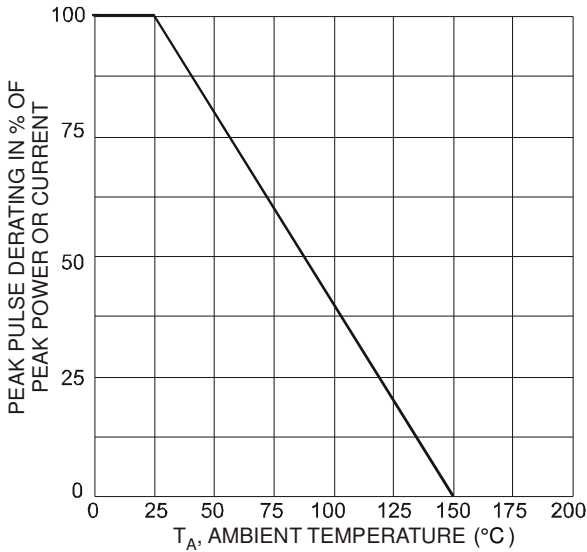


Figure 1 Pulse Derating Curve

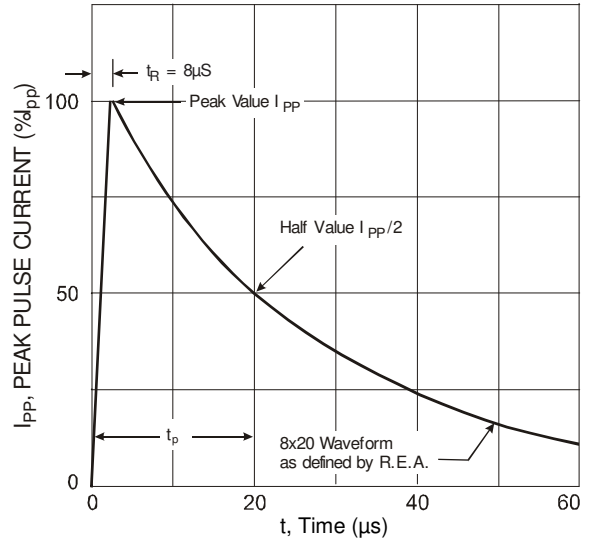


Figure 2 Pulse Waveform

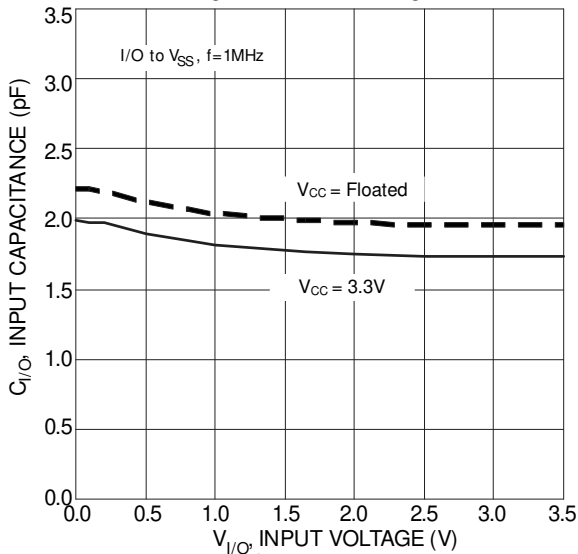


Figure 3 Input Capacitance vs. Input Voltage

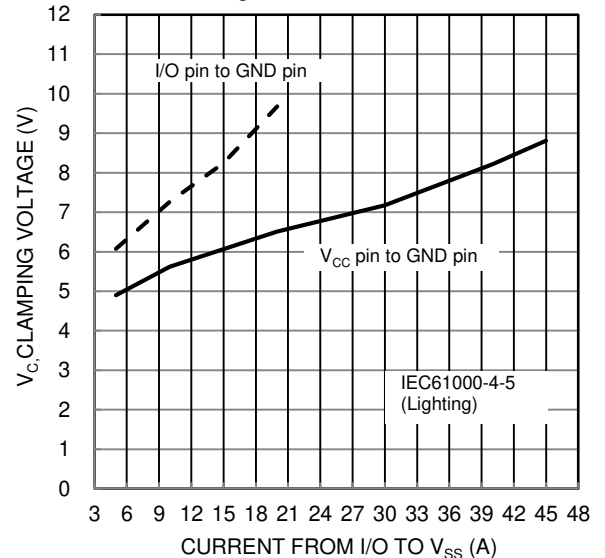


Figure 4 Clamping Voltage Characteristic

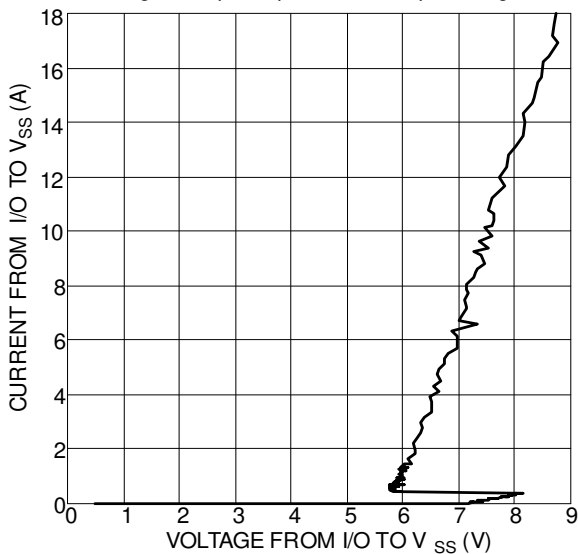


Figure 5 Current vs. Voltage

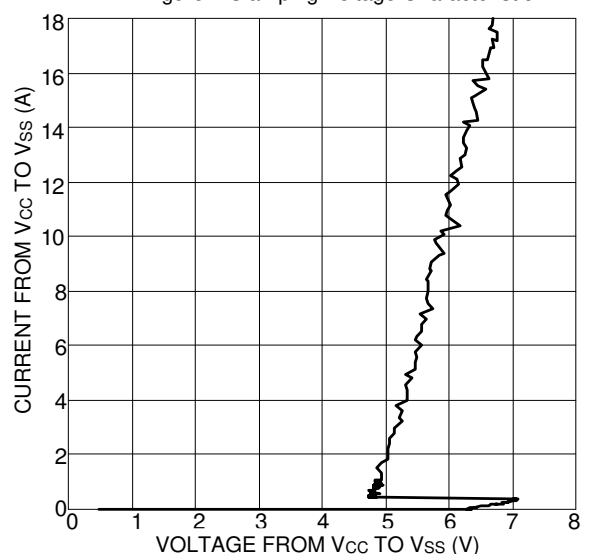
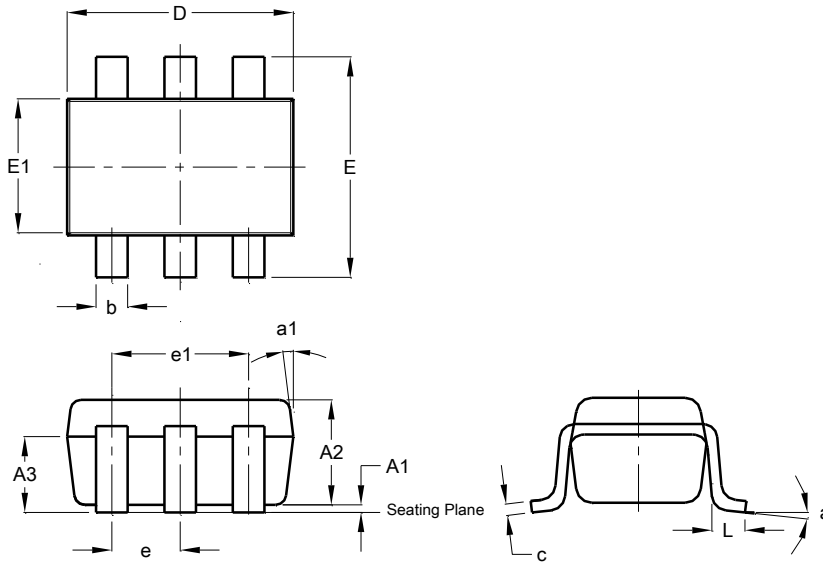


Figure 6 Current vs. Voltage

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT26

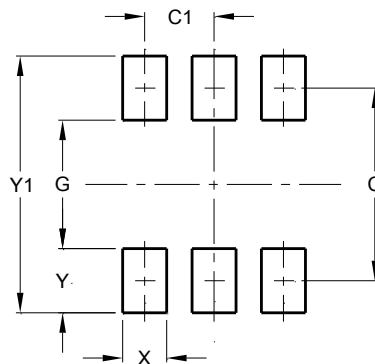


| SOT26 | | | |
|-----------------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.013 | 0.10 | 0.05 |
| A2 | 1.00 | 1.30 | 1.10 |
| A3 | 0.70 | 0.80 | 0.75 |
| b | 0.35 | 0.50 | 0.38 |
| c | 0.10 | 0.20 | 0.15 |
| D | 2.90 | 3.10 | 3.00 |
| e | - | - | 0.95 |
| e1 | - | - | 1.90 |
| E | 2.70 | 3.00 | 2.80 |
| E1 | 1.50 | 1.70 | 1.60 |
| L | 0.35 | 0.55 | 0.40 |
| a | - | - | 8° |
| a1 | - | - | 7° |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT26



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.40 |
| C1 | 0.95 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| Y1 | 3.20 |

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