



**THE DATASHEET OF  
D5V0P4UR6SO-7**



**4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**
**Product Summary**

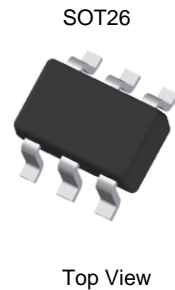
$V_{BR}$ (Min)	$I_{PP}$ (Max)	$C_T$ (Typ)
4.5V	45A	2.1pF

**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**

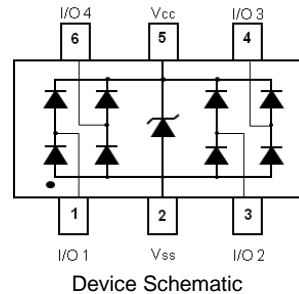
Typically used at high-speed ports such as USB 2.0, IEEE1394 (Firewire<sup>®</sup>, iLink<sup>™</sup>), Serial ATA, DVI, HDMI and PCI.


**Features**

- Low Clamping Voltage: Typical 7.5V at 12A 100ns, TLP, I/O to  $V_{SS}$ ; Typical 5.8V at 12A 100ns, TLP,  $V_{CC}$  to  $V_{SS}$
- IEC 61000-4-2 (ESD): Air –  $\pm 30kV$ , Contact –  $\pm 30kV$
- IEC 61000-4-4 (EFT):  $\pm 80A$  (5/50ns)
- IEC 61000-4-5 (Lighting): 20A, I/O to  $V_{SS}$ ; 45A,  $V_{CC}$  to  $V_{SS}$
- TLP Dynamic Resistance: 0.15 $\Omega$ , I/O to  $V_{SS}$ ; 0.07 $\Omega$ ,  $V_{CC}$  to  $V_{SS}$
- 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)**

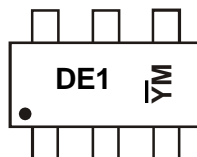
**Mechanical Data**

- Case: SOT26
- 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 <sup>(E3)</sup>
- Weight: 0.016 grams (Approximate)


**Ordering Information** (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D5V0P4UR6SO-7	Standard	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) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

**Marking Information**


DE1 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: D = 2016)  
 M = Month (ex: 9 = September)  
 Note: "—" Represents Internal Code

**Date Code Key**

Year	2016	2017	2018	2019	2020	2021
Code	D	E	F	G	H	I

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, per IEC 61000-4-5	I <sub>PP</sub>	20	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Current, per IEC 61000-4-5	I <sub>PP</sub>	45	A	V <sub>CC</sub> to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP</sub>	180	W	I/O to V <sub>SS</sub> , 8/20μs
Operating Supply Voltage (DC)	V <sub>DC</sub>	3.6	V	V <sub>CC</sub> to V <sub>SS</sub>
ESD Protection – Contact Discharge, per IEC 61000-4-2	V <sub>ESD_CONTACT</sub>	±30	kV	I/O to V <sub>SS</sub> , V <sub>CC</sub> to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_AIR</sub>	±30	kV	I/O to V <sub>SS</sub> , V <sub>CC</sub> to V <sub>SS</sub>
Operating Temperature	T <sub>OP</sub>	-55 to +85	°C	—
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C	—

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	417	°C/W

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

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

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

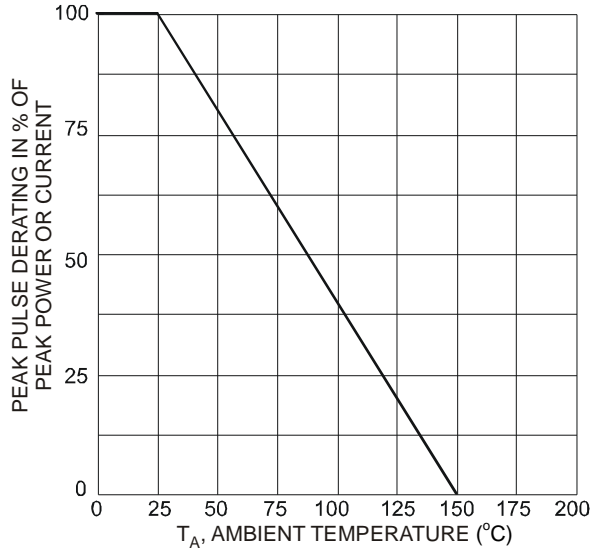


Figure 1 Pulse Derating Curve

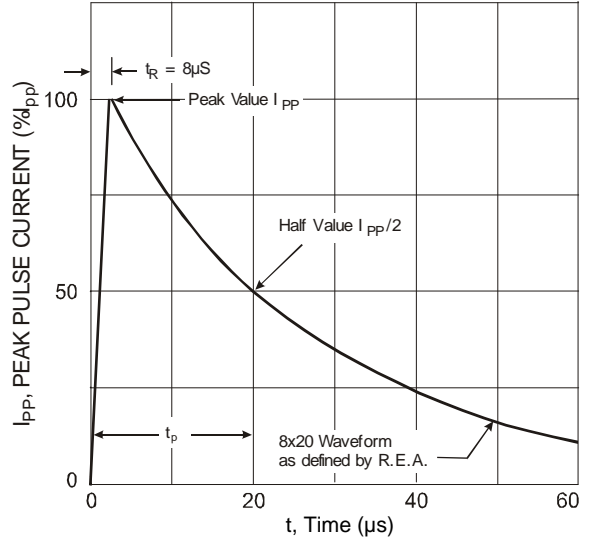


Figure 2 Pulse Waveform

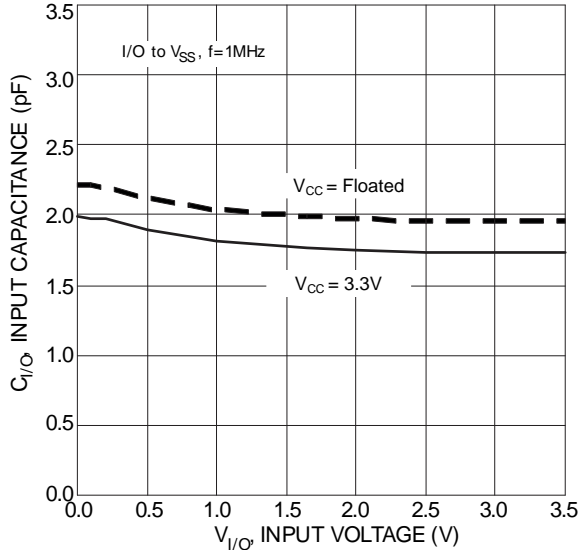


Figure 3 Input Capacitance vs. Input Voltage

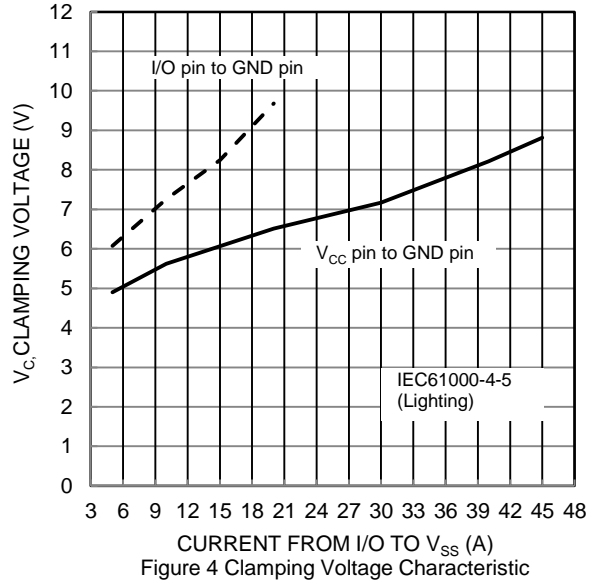


Figure 4 Clamping Voltage Characteristic

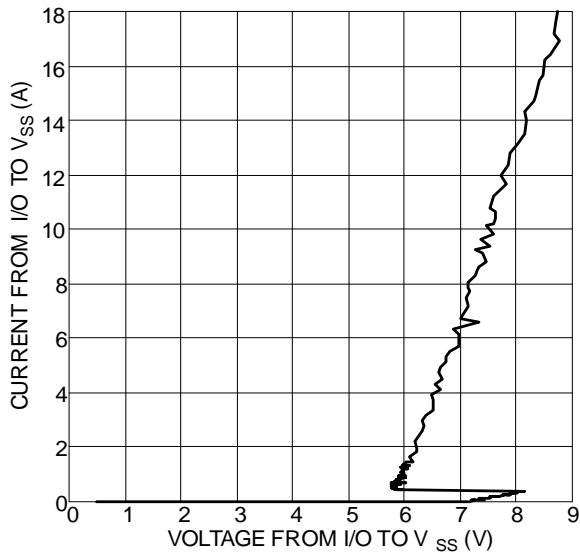


Figure 5 Current vs. Voltage

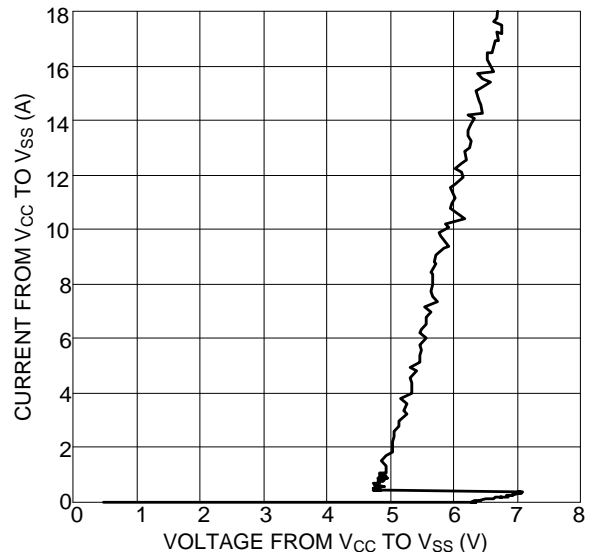
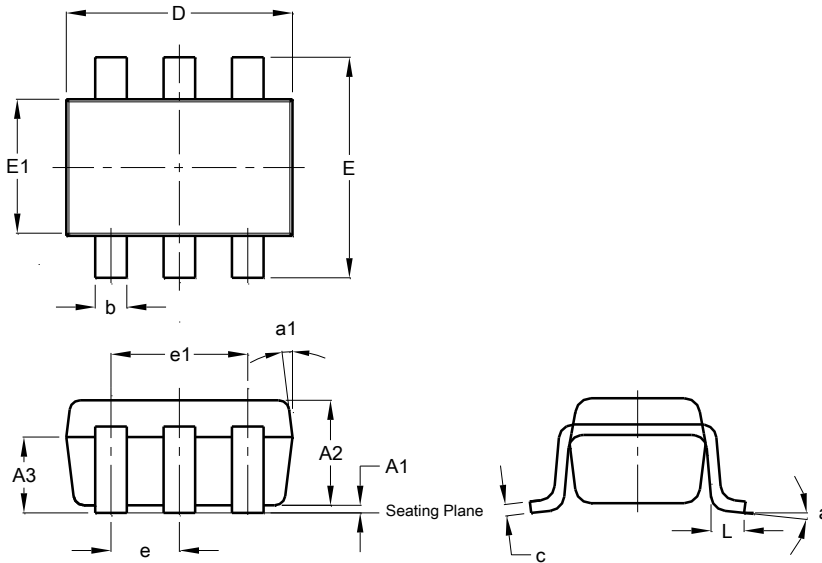


Figure 6 Current vs. Voltage

## Package Outline Dimensions

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

SOT26

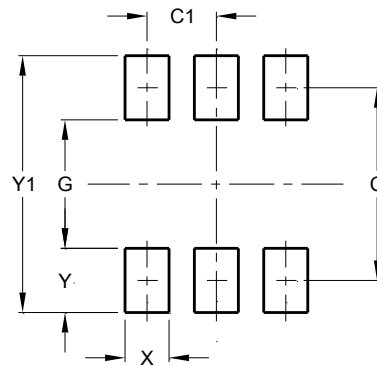


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

## 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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