



**THE DATASHEET OF  
DESD1P0RFWQ-7**



## Features

- Low Capacitance
- Small Surface Mount Package
- For ESD Protection of High Speed Data Lines
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

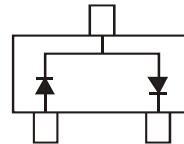
## Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed Over Alloy 42 Leadframe  
(Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Weight: 0.006 Grams (Approximate)

SOT323



Top View



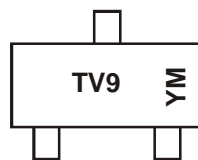
Top View  
Internal Schematic

## Ordering Information (Notes 3)

| Part Number   | Qualification | Case   | Packaging        |
|---------------|---------------|--------|------------------|
| DESD1P0RFW-7  | Commercial    | SOT323 | 3000/Tape & Reel |
| DESD1P0RFWQ-7 | Automotive    | SOT323 | 3000/Tape & Reel |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For Packaging Details, go to our website at <http://www.diodes.com>.

## Marking Information



TV9 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|
| Code | Y    | Z    | A    | B    | C    | D    | E    |

| 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** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                     | Symbol             | Value    | Unit | Conditions                       |
|------------------------------------|--------------------|----------|------|----------------------------------|
| Peak Pulse Current                 | $I_{PP}$           | 15       | A    | 8/20 $\mu\text{s}$ (Notes 4 & 5) |
| ESD Protection – Contact Discharge | $V_{ESD\_Contact}$ | $\pm 30$ | kV   | Standard IEC 61000-4-2(Notes 5)  |
| ESD Protection – Air Discharge     | $V_{ESD\_Air}$     | $\pm 30$ | kV   | Standard IEC 61000-4-2(Notes 5)  |

**Thermal Characteristics**

| Characteristic                                      | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 6)                          | $P_D$           | 200         | mW                 |
| Thermal Resistance Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 625         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range             | $T_J, T_{STG}$  | -65 to +150 | $^\circ\text{C}$   |

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic (Note 4)           | Symbol    | Min | Typ | Max | Unit | Test Conditions                                   |
|-----------------------------------|-----------|-----|-----|-----|------|---|
| Reverse Working Voltage           | $V_{RWM}$ | -   | -   | 70  | V    | -   |
| Reverse Current                   | $I_{RM}$  | -   | -   | 100 | nA   | $V_{RM} = 70\text{V}$                             |
| Forward Clamping Voltage (Note 5) | $V_{FC}$  | -   | 2   | 6   | V    | $I_{PP} = 3\text{A}$ ; per IEC 61000-4-5 (Note 7) |
|                                   |           | -   | 4   | 8   |      |   |
| Capacitance                       | $C_T$     | -   | 1   | 1.5 | pF   | $V_R = 0\text{V}, f = 1\text{MHz}$ (Note 8)       |

- Notes:
4. Diodes Short duration pulse test used to minimize self-heating effect.
  5. Anti-parallel or rail-to-rail connection
  6. Device mounted on FR-4 PCB with minimum recommended pad layout.
  7. Clamping voltage value is based on an 8x20  $\mu\text{s}$  peak pulse current ( $I_{pp}$ ) waveform.
  8. Total capacitance line to ground (2 diodes in parallel)

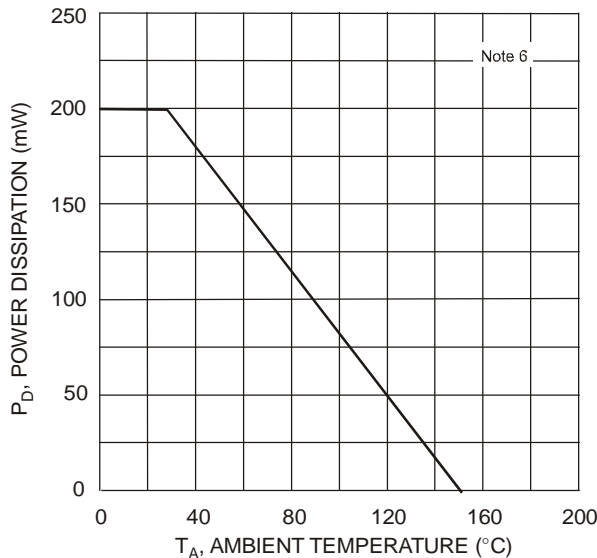


Fig. 1 Power Derating Curve, Total Package

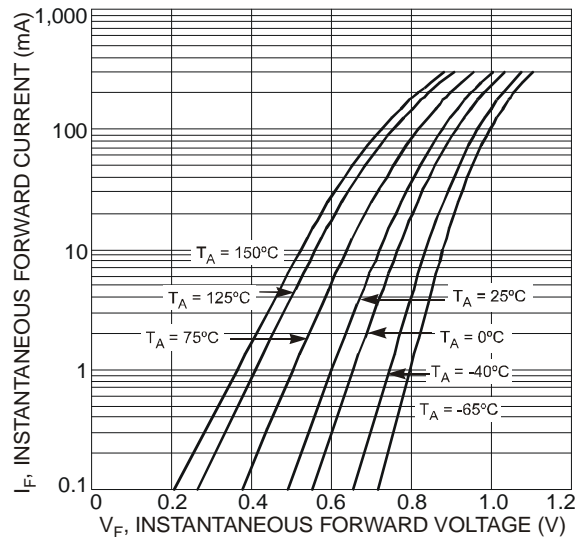


Fig. 2 Typical Forward Characteristics, Per Element

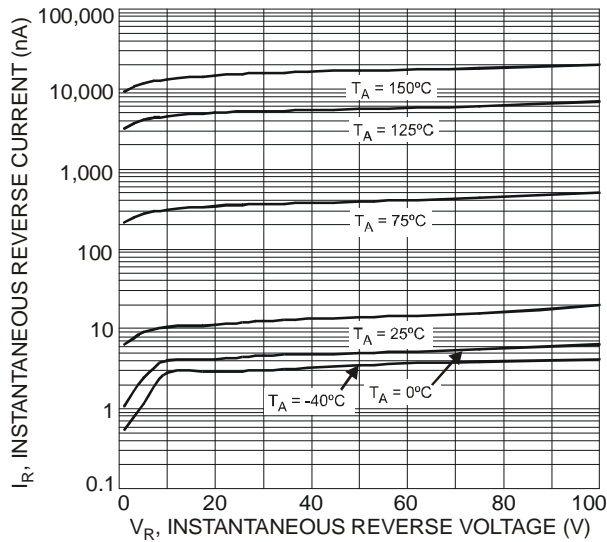


Fig. 3 Typical Reverse Characteristics, Per Element

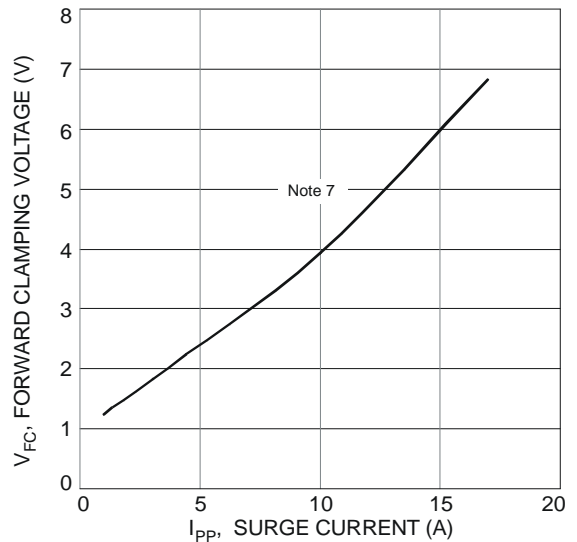
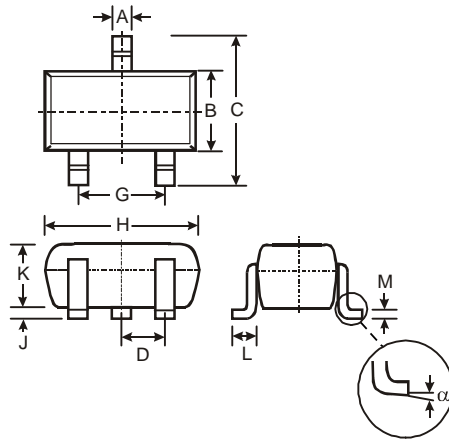


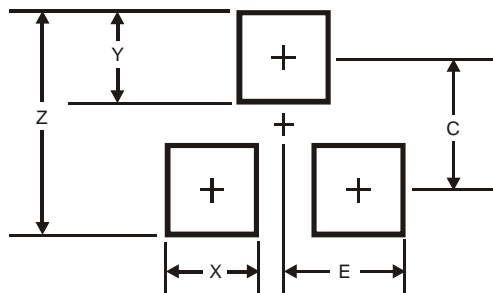
Fig. 4 Typical Forward Clamping Characteristics

**Package Outline Dimensions**



| SOT323               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.25 | 0.40 | 0.30 |
| B                    | 1.15 | 1.35 | 1.30 |
| C                    | 2.00 | 2.20 | 2.10 |
| D                    | -    | -    | 0.65 |
| G                    | 1.20 | 1.40 | 1.30 |
| H                    | 1.80 | 2.20 | 2.15 |
| J                    | 0.0  | 0.10 | 0.05 |
| K                    | 0.90 | 1.00 | 1.00 |
| L                    | 0.25 | 0.40 | 0.30 |
| M                    | 0.10 | 0.18 | 0.11 |
| $\alpha$             | 0°   | 8°   | -    |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.8           |
| X          | 0.7           |
| Y          | 0.9           |
| C          | 1.9           |
| E          | 1.0           |

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