

SURFACE MOUNT DATALINE PROTECTION DEVICE

Features

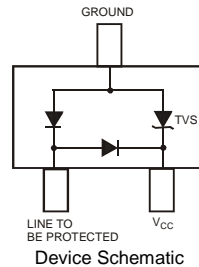
- 300W Peak Pulse Power ($t_p = 8 \times 20 \mu s$)
- Transient Protection for Data Line to IEC61000-4-2 Level 4 (ESD), 8kV HBM
 - Contact: Discharge – $\pm 30kV$
 - Air: Discharge – $\pm 30kV$
- IEC 61000-4-4 (EFT)
- Low Leakage Current
- Surface Mount Package Ideally Suited for Automated Insertion
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 Leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Page 1
- Ordering Information: See Page 1
- Weight: 0.008 grams (Approximate)



Top View



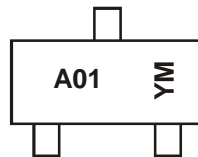
Device Schematic

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|-------|------------------|
| DLPT05-7-F | SOT23 | 3000/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 <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



A01 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | ... | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|-----|------|------|------|------|
| Code | J | K | L | M | ... | G | H | I | J |

| 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 |

- Notes:
5. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb_2O_3 Fire Retardants.

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|-----------|-------|------|
| Peak Pulse Power ($t_p = 8 \times 20 \mu\text{s}$, per Figure 2) | P_{PK} | 300 | W |
| Peak Forward Voltage ($I_{PP} = 1\text{A}$, $t_p = 8 \times 20 \mu\text{s}$, per Figure 2) | V_{FP} | 2.1 | V |
| Diode Peak Repetitive Reverse Voltage | V_{RRM} | 75 | V |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Typical Thermal Resistance, Junction to Ambient (Note 10) | $R_{\theta JA}$ | 417 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

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

| Reverse Standoff Voltage | Breakdown Voltage V_{BR} @ I_T | | Test Current | Max. Reverse Leakage @ V_{RWM} (Note 9) | Max. Clamping Voltage @ $I_{pp} = 1\text{A}$ (Note 8) | Typical Peak Pulse Current (Note 7) | Typical Total Capacitance (Note 6) |
|--------------------------|------------------------------------|---------|--------------|---|---|-------------------------------------|------------------------------------|
| | V_{RWM} (V) | Min (V) | Max (V) | I_T (mA) | I_R (μA) | V_C (V) | (A) |
| 5 | 6.0 | — | 1.0 | 20 | 9.8 | 17 | 1.9 |

- Notes:
6. $V_R = 0\text{V}$, $f = 1\text{MHz}$ from line to be protected to ground pin.
 7. $t_p = 8 \times 20 \mu\text{s}$.
 8. Clamping voltage value is based on an $8 \times 20 \mu\text{s}$ peak pulse current (I_{pp}) waveform.
 9. Short duration pulse test used to minimize self-heating effect.
 10. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.

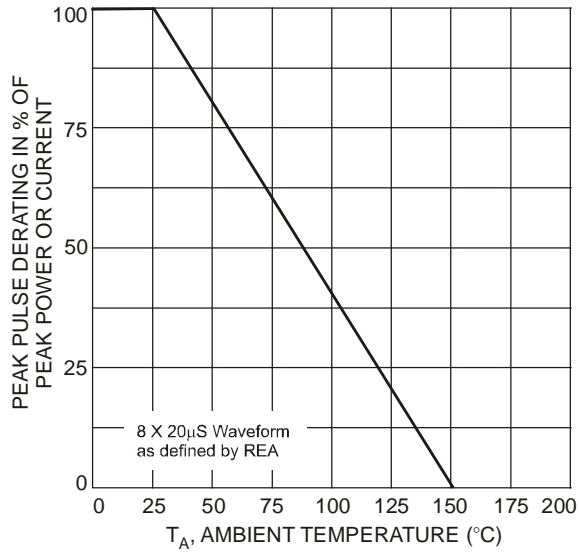


Fig. 1 Pulse Derating Curve

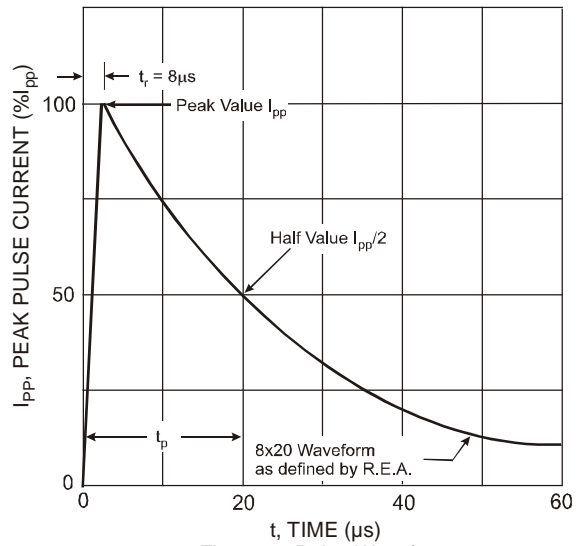


Figure 2. Pulse Waveform

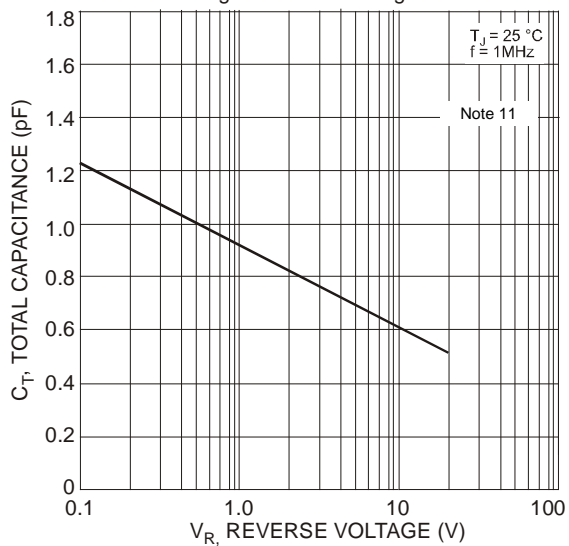


Fig. 3 Typical Total Capacitance vs. Reverse Voltage

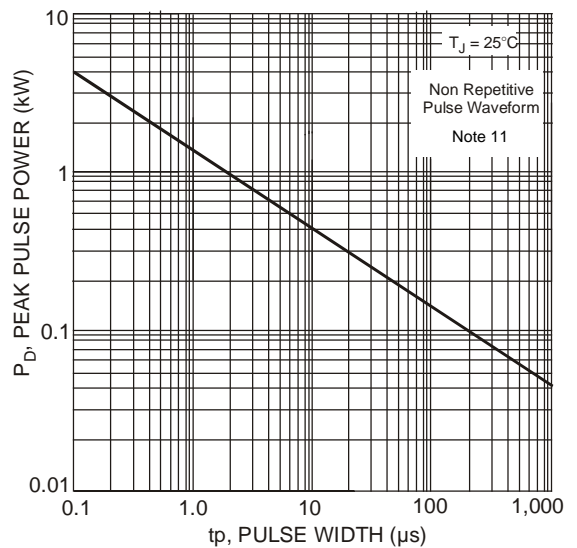


Fig. 4 Pulse Rating Curve

Notes: 11. Measured from line to be protected to ground pin.

Typical Application Schematics

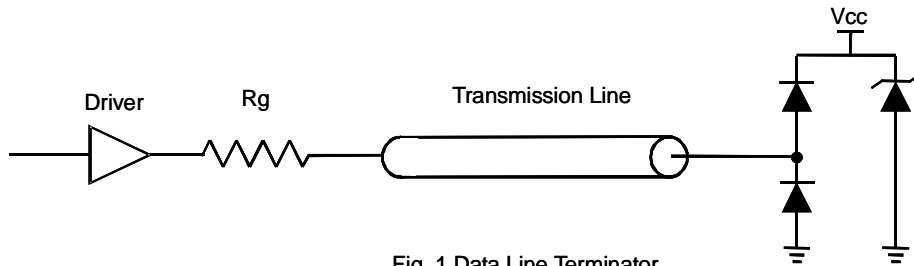


Fig. 1 Data Line Terminator

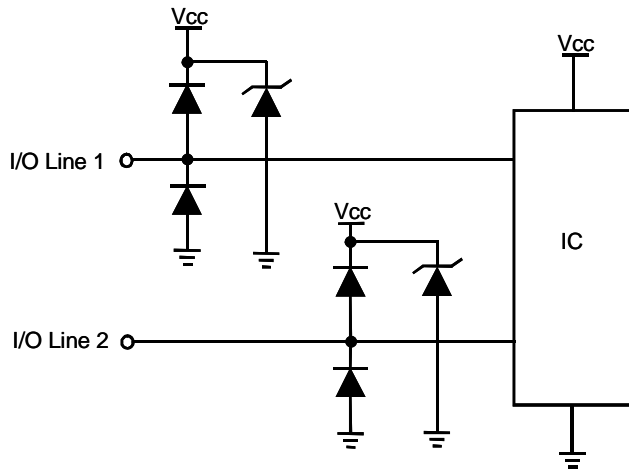
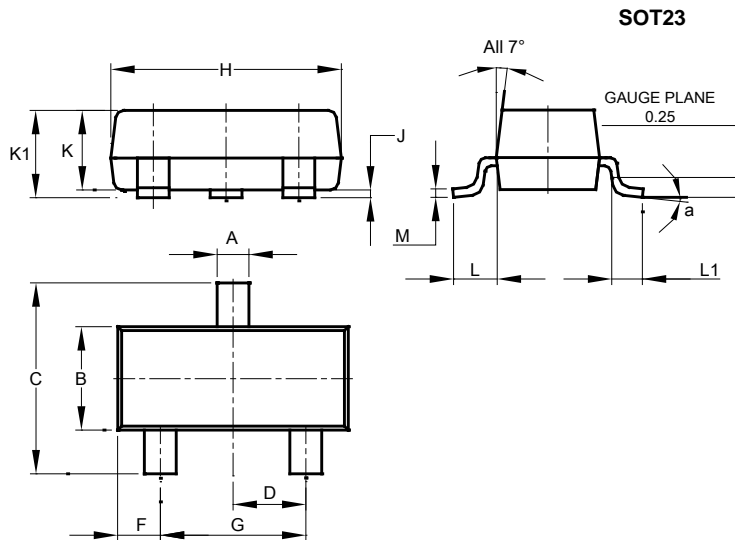


Fig. 2 Data Line Protection

Package Outline Dimensions

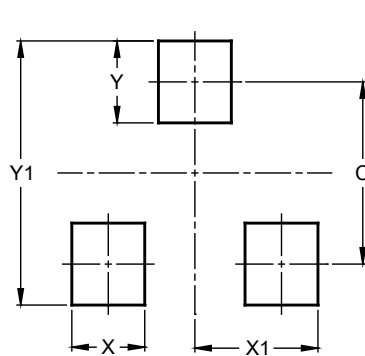
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.890 | 1.00 | 0.975 |
| K1 | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L1 | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.0 |
| X | 0.8 |
| X1 | 1.35 |
| Y | 0.9 |
| Y1 | 2.9 |

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