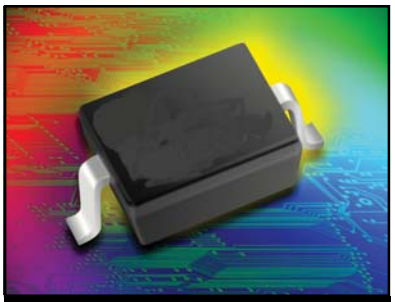
PROTEK DEVICES

# PSD03 thru PSD36C

## STANDARD CAPACITANCE TVS ARRAY



SOD-323

## APPLICATIONS

✔ Laptop Computers
✔ Cellular Phones
✔ Digital Cameras
✔ Personal Digital Assistant (PDA)

## IEC COMPATIBILITY (EN61000-4)

✔ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
✔ 61000-4-4 (EFT): 40A - 5/50ns
✔ 61000-4-5 (Surge): 24A, 8/20µs - Level 2(Line-Gnd) & Level 3(Line-Line)

## FEATURES

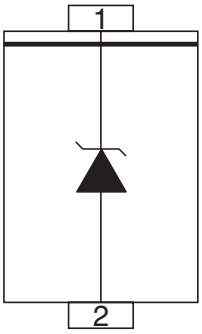
✔ Unidirectional: 500 Watts Peak Pulse Power per Line (tp = 8/20µs)
✔ BidirectionalL 400 Watts Peak Pulse Power per Line (tp = 8/20µs)
✔ Unidirectional & Bidirectional Configurations
✔ Replacement for MLV (0805)
✔ Protects One Power or I/O Port
✔ ESD Protection > 40 kilovolts
✔ Low Clamping Voltage
✔ Available in Multiple Voltage Types Ranging from 3V to 36V
✔ RoHS Compliant

## MECHANICAL CHARACTERISTICS

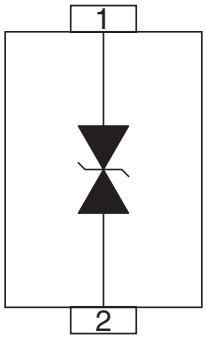
✔ Molded JEDEC SOD-323 Package
✔ Weight 5 milligrams (Approximate)
✔ Available in Lead-Free Pure-Tin Plating(Annealed)
✔ Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
✔ Consult Factory for Leaded Device Availability
✔ Flammability Rating UL 94V-0
✔ 8mm Tape and Reel Per EIA Standard 481
✔ Device Marking: Marking Code & Polarity Band *(Unidirectional Only)*

## PIN CONFIGURATIONS

**UNIDIRECTIONAL**




**BIDIRECTIONAL**



## DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **VALUE** | **UNITS** |
| Unidirectional Peak Pulse Power ($t_p$ = 8/20µs) - See Figure 1 | $P_{PP}$ | 500 | Watts |
| Bidirectional Peak Pulse Power ($t_p$ = 8/20µs) - See Figure 1 | $P_{PP}$ | 400 | Watts |
| Operating Temperature | $T_L$ | -55 to 150 | °C |
| Storage Temperature | $T_{STG}$ | -55 to 150 | °C |

| ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified | | | | | | | |
|---|---|---|---|---|---|---|---|
| PART NUMBER (See Notes 1-2) | DEVICE MARKING | RATED STAND-OFF VOLTAGE $V_{WM}$ VOLTS | MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_P$ = 1A $V_C$ VOLTS | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @8/20µs $V_C$ @ $I_{PP}$ | MAXIMUM LEAKAGE CURRENT @$V_{WM}$ $I_D$ µA | TYPICAL CAPACITANCE 0V @ 1 MHz C pF |
| PSD03 | A | 3.3 | 4.0 | 6.5 | 10.9V @ 43.0A | 125 | 500 |
| PSD03C | G | 3.3 | 4.0 | 7.0 | 10.9V @ 39.0A | 125 | 200 |
| PSD05 | B | 5.0 | 6.0 | 9.8 | 13.5V @ 42.0A | 10 | 350 |
| PSD05C | H | 5.0 | 6.0 | 9.8 | 14.5V @ 28.0A | 10 | 175 |
| PSD08 | C | 8.0 | 8.5 | 13.4 | 16.9V @ 34.0A | 10 | 250 |
| PSD08C | J | 8.0 | 8.5 | 13.4 | 18.5V @ 17.0A | 10 | 150 |
| PSD12 | D | 12.0 | 13.3 | 19.0 | 25.9V @ 21.0A | 1 | 150 |
| PSD12C | K | 12.0 | 13.3 | 19.0 | 29.5V @ 14.0A | 1 | 50 |
| PSD15 | E | 15.0 | 16.7 | 24.0 | 30.0V @ 17.0A | 1 | 100 |
| PSD15C | L | 15.0 | 16.7 | 24.0 | 33.0V @ 12.0A | 1 | 40 |
| PSD18 | G | 18.0 | 20.0 | 29.0 | 40.0V @ 9.0A | 1 | 90 |
| PSD18C | N | 18.0 | 20.0 | 29.0 | 40.0V @ 9.0A | 1 | 40 |
| PSD24 | F | 24.0 | 26.7 | 43.0 | 49.0V @ 12.0A | 1 | 88 |
| PSD24C | M | 24.0 | 26.7 | 43.0 | 46.2V @ 9.0A | 1 | 40 |
| PSD36 | R | 36.0 | 40.0 | 60.0 | 75.0V @ 5.0A | 1 | 75 |
| PSD36C | T | 36.0 | 40.0 | 60.0 | 75.0V @ 5.0A | 1 | 35 |

**Note 1:** Part numbers with an additional “C” suffix are bidirectional devices, i.e., PSD05C.
**Note 2:** *Unidirectional Only:* Positive potential is applied from pin 2 to 1 or pin 3 to 4.

## GRAPHS

**FIGURE 1**
**PEAK PULSE POWER VS PULSE TIME**

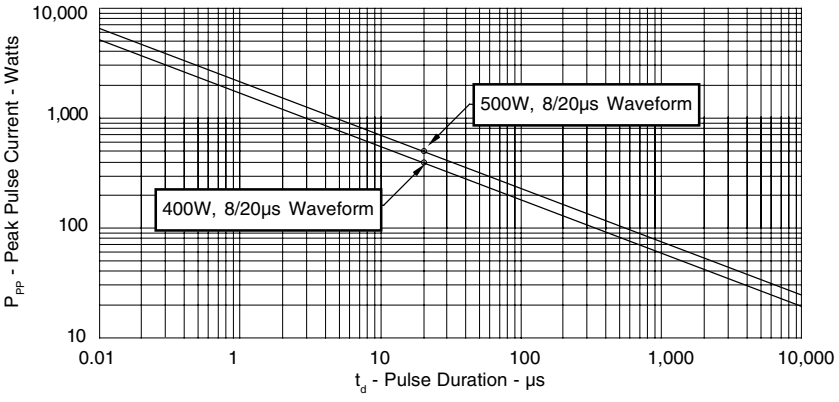



**FIGURE 2**
**PULSE WAVE FORM**

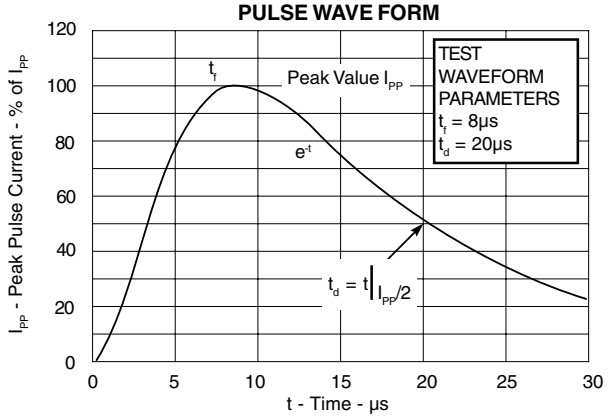



**FIGURE 3**
**POWER DERATING CURVE**

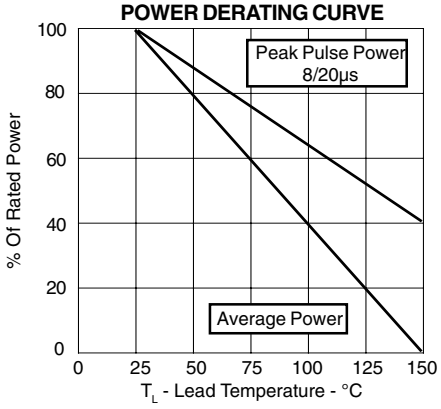
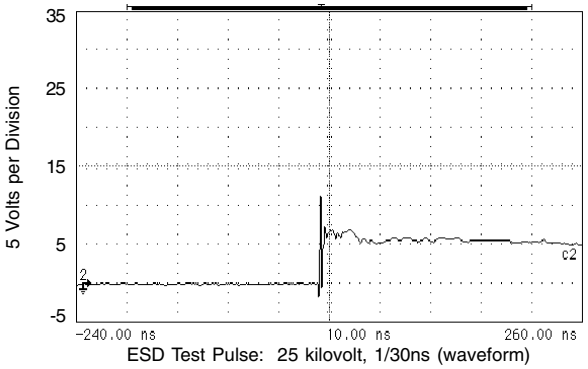
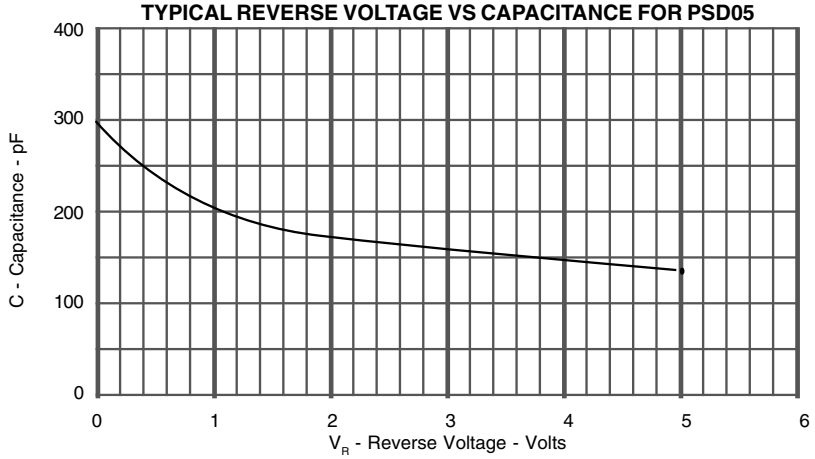



**FIGURE 4**
**OVERSHOOT & CLAMPING VOLTAGE FOR PSD03**



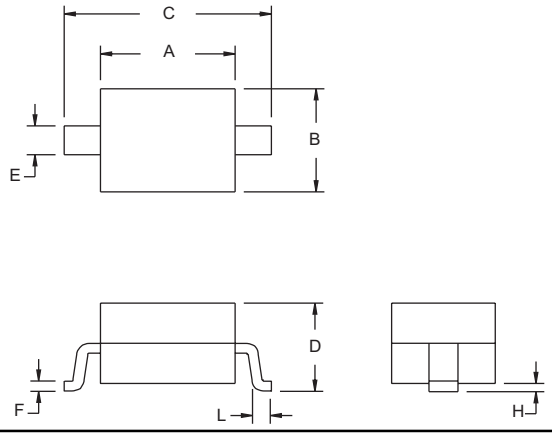

ESD Test Pulse: 25 kilovolt, 1/30ns (waveform)

**FIGURE 5**
**TYPICAL REVERSE VOLTAGE VS CAPACITANCE FOR PSD05**



## SOD-323 PACKAGE OUTLINE & DIMENSIONS

**PACKAGE OUTLINE**



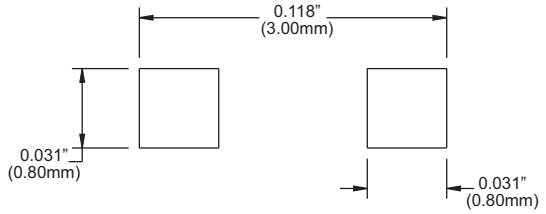

**SOD-323 PACKAGE**



**PACKAGE DIMENSIONS**

| DIM | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.60 | 1.90 | 0.063 | 0.075 |
| B | 1.15 | 1.45 | 0.045 | 0.057 |
| C | 2.39 | 2.70 | 0.094 | 0.106 |
| D | 0.92 | 1.10 | 0.033 | 0.043 |
| E | 0.25 | 0.40 | 0.010 | 0.016 |
| F | 0.10 | 0.20 | 0.004 | 0.008 |
| H | - | 0.10 | - | 0.004 |
| L | 0.20 | - | 0.08 | - |

**MOUNTING PAD**




**NOTES**

1. Controlling Dimensions in Millimeters.
2. Dimensions are exclusive of mold flash and metal burrs.

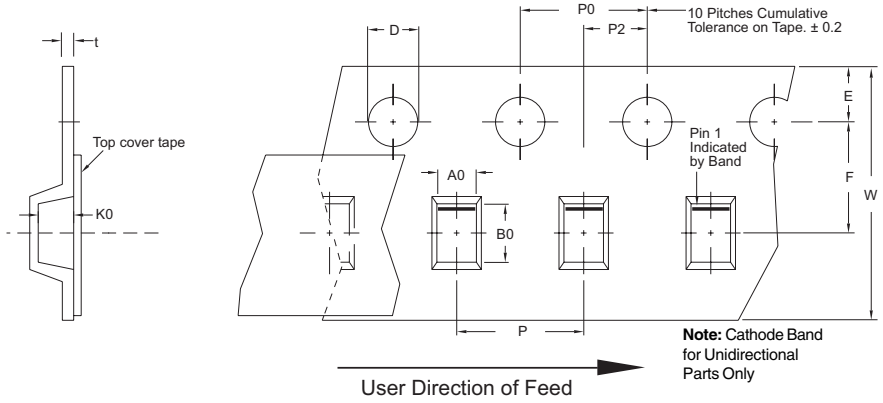
**TAPE & REEL ORDERING NOMENCLATURE**

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Suffix-T7 = 7 Inch Reel - 3,000 pieces per 8mm tape, i.e., *PSD05C-T7.*
3. Suffix - LF = Lead-Free, Pure-Tin Plating, i.e., *PSD05C-LF-T7.*

**Outline & Dimensions: Rev 2 - 9/05, 06010**

Tape & Reel Specifications (Dimensions in millimeters)

| Reel Dia. | Tape Width | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 178mm (7") | 8mm | 1.55 ± 0.10 | 2.90 ± 0.10 | 1.35 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ±0.30 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | 0.25 |

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