

4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY
Product Summary

| | | |
|-----------------------------|-----------------------------|------------------------------|
| V_{BR} (min) | I_{PP} (max) | C_{I/O} (typ) |
| 6.2V | 6A | 0.65pF |

Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of low capacitance and high ESD surge capability makes it ideal for use in high speed ports such as USB 2.0, IEEE1394, HDMI, Laptop and Personal Computers, Flat Panel Displays, Video Graphics Displays, SIM Ports.

Applications

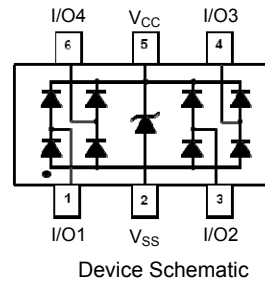
- USB 2.0
- IEEE1394
- SIM Ports
- Portable Electronics
- Computers and Peripheral

Features

- Low Clamping Voltage, I/O to V_{SS}
Typical 9V at 10A 100ns, TLP
Typical 7.7V at 6A 8μs/20μs
- IEC 61000-4-2 (ESD): Air – +27/-19kV, Contact – ±16kV
- IEC 61000-4-4 (EFT): Level-4
- 4 Channels of ESD Protection
- TLP Dynamic Resistance: 0.25Ω
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

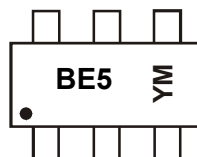
Mechanical Data

- Case: TSOT26
- 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 Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.013 grams (approximate)


Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| DT1042-04TS-7 | Standard | BE5 | 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 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


BE5= Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|------|------|------|------|------|
| Code | A | B | C | D | E | F |

| 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_I/O} | ±6 | A | I/O to V _{SS} , 8/20μs |
| Peak Pulse Power, per IEC 61000-4-5 | P _{PP_I/O} | 55 | W | I/O to V _{SS} , 8/20μs |
| Operating Voltage (DC) | V _{DC} | 5.5 | V | I/O to V _{SS} |
| ESD Protection – Contact Discharge, per IEC 61000-4-2 | V _{ESD_I/O} | ±16 | kV | I/O to V _{SS} |
| ESD Protection – Air Discharge, per IEC 61000-4-2 | V _{ESD_I/O} | +27/-19 | kV | I/O to V _{SS} |
| Operating Temperature | T _{OP} | -55 to +85 | °C | – |
| Storage Temperature | 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} | – | – | 5.0 | V | V _{CC} to V _{SS} |
| Reverse Current (Note 6) | I _{R(V_{CC} to V_{SS})} | – | – | 1.0 | μA | V _R = V _{RWM} = 5V, V _{CC} to V _{SS} |
| Reverse Current (Note 6) | I _{R(I/O to V_{SS})} | – | – | 0.5 | μA | V _R = V _{RWM} = 5V, any I/O to V _{SS} |
| Reverse Breakdown Voltage | V _{BR} | 6.2 | – | – | V | I _R = 1mA, V _{CC} to V _{SS} |
| Forward Clamping Voltage | V _F | -1.0 | -0.8 | – | V | I _F = -15mA, V _{CC} to V _{SS} |
| Reverse Clamping Voltage(Note 7) | V _{C_V_{CC}} | – | 6.3 | – | V | I _{PP} = 9A, V _{CC} to V _{SS} , 8/20 μs |
| | V _{C_I/O} | – | 7.7 | 9 | V | I _{PP} = 6A, I/O to V _{SS} , 8/20 μs |
| ESD Clamping Voltage | V _{ESD_V_{CC}} | – | 6.8 | – | V | TLP, 10A, tp = 100 ns, V _{CC} to V _{SS} , per Fig. 8 |
| | V _{ESD_I/O} | – | 9 | – | V | TLP, 10A, tp = 100 ns, I/O to V _{SS} , per Fig. 8 |
| Dynamic Resistance | R _{DIF_V_{CC}} | – | 0.1 | – | Ω | TLP, 10A, tp = 100 ns, V _{CC} to V _{SS} |
| | R _{DIF_I/O} | – | 0.25 | – | Ω | TLP, 10A, tp = 100 ns, I/O to V _{SS} |
| Channel Input Capacitance | C _{I/O to V_{SS}} | – | 0.65 | 0.8 | pF | V _R = 2.5V, V _{CC} = 5V, f = 1MHz |
| Variation of Channel Input Capacitance | ΔC _{I/O} | – | 0.02 | – | pF | V _{CC} = 5V, V _{SS} = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, I/O_x to V _{SS} – I/O_y to V _{SS} |

- Notes:
- Device mounted on Polyimide 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>.
 - Short duration pulse test used to minimize self-heating effect.
 - Clamping voltage value is based on an 8x20μs peak pulse current (I_{pp}) waveform.

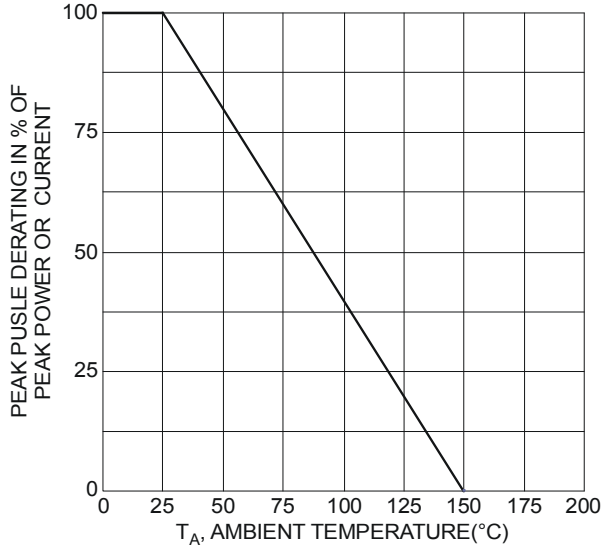


Figure 1 Pulse Derating Curve

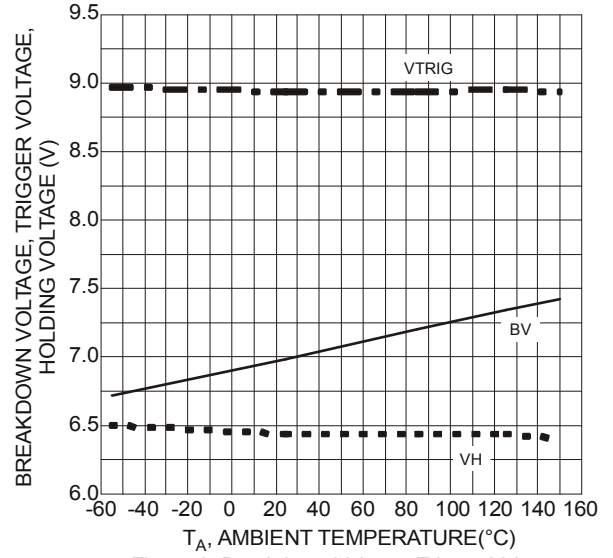


Figure 2 Breakdown Voltage, Trigger Voltage, Holding Voltage vs. Ambient Temperature

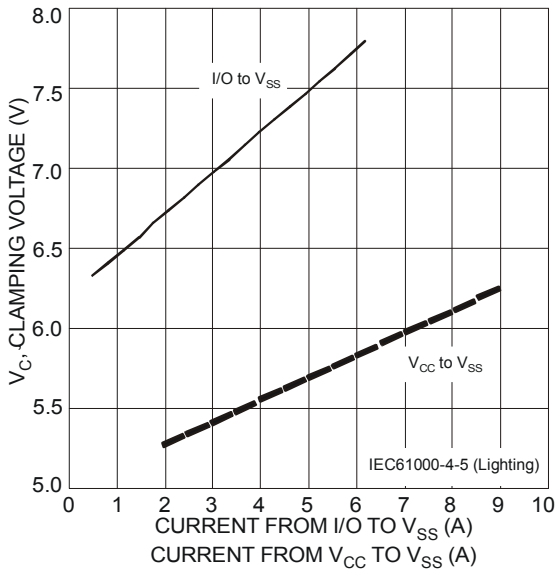


Figure 3 Clamping Voltage Characteristics

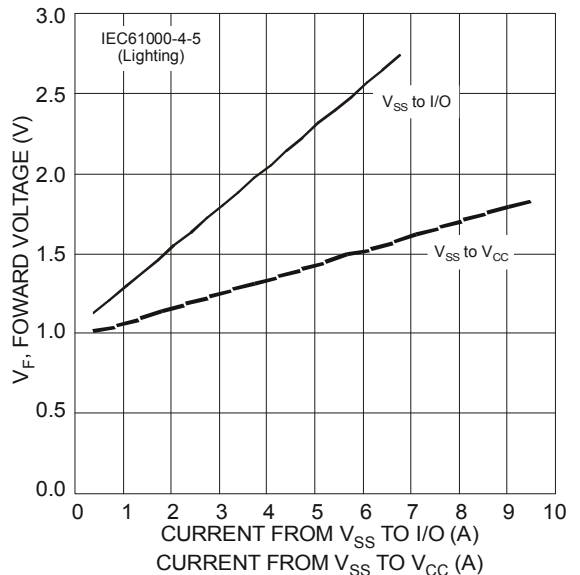


Figure 4 Forward Voltage Characteristics

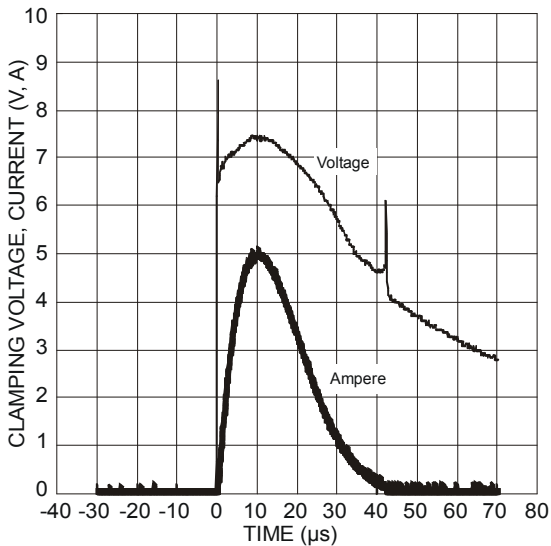


Figure 5 Waveform of Clamping Voltage, Current vs. Time (8/20µs, I/O to VSS)

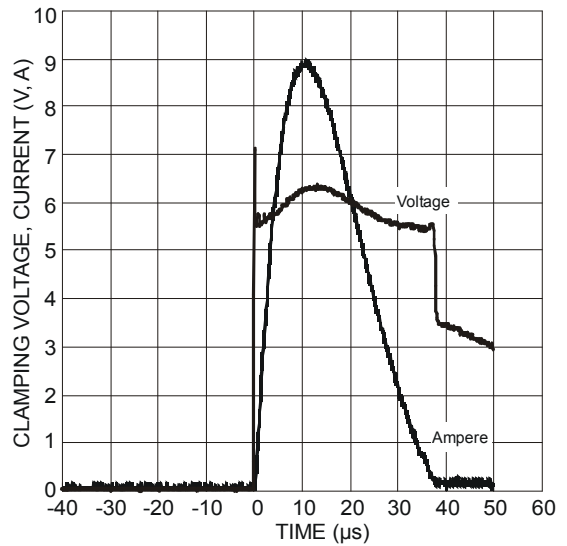


Figure 6 Waveform of Clamping Voltage, Current vs. Time (8/20µs, VCC to VSS)

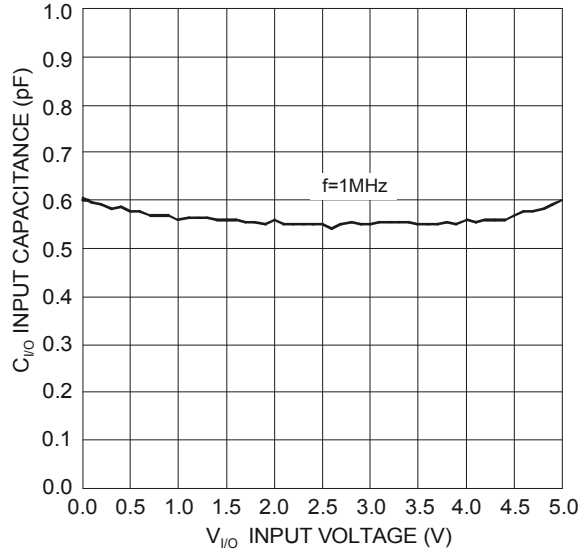


Figure 7 Input Capacitance vs. Input Voltage

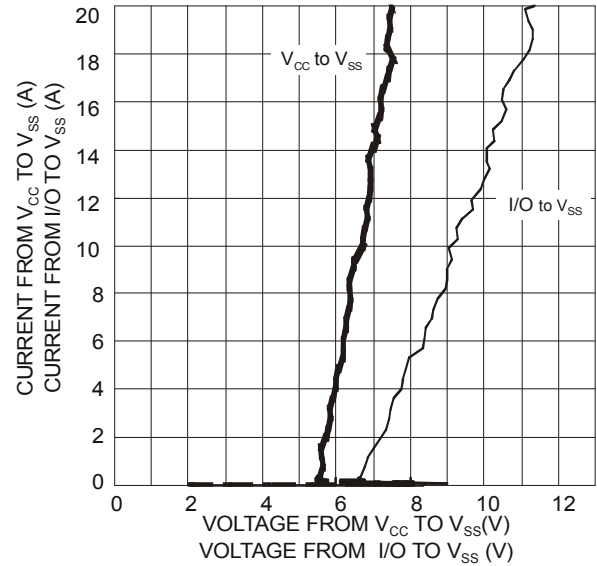
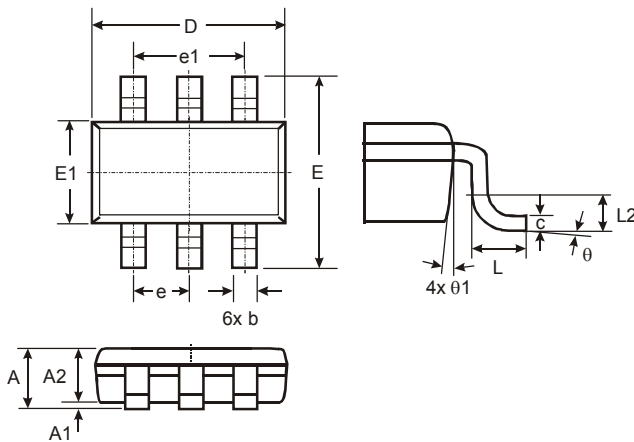


Figure 8. Current vs. Voltage

Package Outline Dimensions

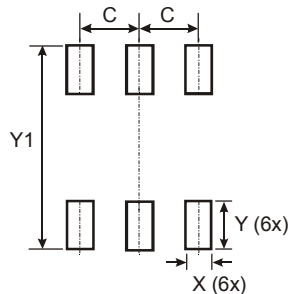
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| TSOT26 | | | |
|-----------------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | – | 1.00 | – |
| A1 | 0.01 | 0.10 | – |
| A2 | 0.84 | 0.90 | – |
| D | – | – | 2.90 |
| E | – | – | 2.80 |
| E1 | – | – | 1.60 |
| b | 0.30 | 0.45 | – |
| c | 0.12 | 0.20 | – |
| e | – | – | 0.95 |
| e1 | – | – | 1.90 |
| L | 0.30 | 0.50 | – |
| L2 | – | – | 0.25 |
| θ | 0° | 8° | 4° |
| θ1 | 4° | 12° | – |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.950 |
| X | 0.700 |
| Y | 1.000 |
| Y1 | 3.199 |

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