



**THE DATASHEET OF  
D5V0Q1B2CSP-7**



## Product Summary

|                             |                             |                            |
|-----------------------------|-----------------------------|----------------------------|
| <b>V<sub>BR</sub> (min)</b> | <b>I<sub>PP</sub> (max)</b> | <b>C<sub>T</sub> (typ)</b> |
| 6.0V                        | 3A                          | 5.5pF                      |

## Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for use in portable applications such as cellular phones, digital cameras and MP3 players.

## Applications

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

## Features

- Ultra-Small, Low Profile Leadless Surface Mount Package (0.600 \* 0.300 x 0.300mm)
- IEC 61000-4-2 (ESD): Air – ±15kV, Contact – ±14kV
- IEC 61000-4-5 (Lightning): 3A (8/20µs)
- 1 Channel of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

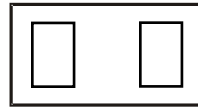
## Mechanical Data

- Case: X2-DSN0603-2
- Case Material: Chip Scale Package
- Terminals: NiAu Bump. Solderable per MIL-STD-202, Method 208 <sup>e4</sup>
- Weight: 0.0002 grams (Approximate)

X2-DSN0603-2



Top View



Bottom View



Device Schematic

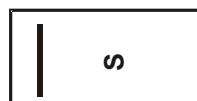
## Ordering Information (Note 4)

| Product       | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel  |
|---------------|------------|---------|--------------------|-----------------|--------------------|
| D5V0Q1B2CSP-7 | Standard   | S       | 7                  | 8               | 10,000/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

X2-DSN0603-2



S = Product Type Marking Code

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

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Current                 | I <sub>PP</sub>          | 3     | A    | 8/20μs, per Figure 1   |
| ESD Protection – Contact Discharge | V <sub>ESD_Contact</sub> | ±14   | kV   | IEC 61000-4-2 Standard |
| ESD Protection – Air Discharge     | V <sub>ESD_Air</sub>     | ±15   | kV   | IEC 61000-4-2 Standard |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5)               | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 500         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

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

| Characteristic                   | Symbol           | Min | Typ | Max | Unit | Test Conditions   |
|----------------------------------|------------------|-----|-----|-----|------|---|
| Reverse Standoff Voltage         | V <sub>RWM</sub> | —   | —   | 5.5 | V    | —   |
| Channel Leakage Current (Note 6) | I <sub>RM</sub>  | —   | —   | 100 | nA   | V <sub>RWM</sub> = 5.5V                                   |
| Clamping Voltage                 | V <sub>CL</sub>  | —   | 7.2 | —   | V    | I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μS             |
|                                  |                  | —   | 8.4 | —   |      | I <sub>PP</sub> = 3A, t <sub>p</sub> = 8/20μS             |
| ESD Clamping Voltage             | V <sub>CL</sub>  | —   | 5.9 | —   | V    | TLP, 1A, t <sub>p</sub> = 100 ns, I/O to V <sub>SS</sub>  |
|                                  |                  | —   | 8.3 | —   |      | TLP, 16A, t <sub>p</sub> = 100 ns, I/O to V <sub>SS</sub> |
| Differential Resistance          | R <sub>DYN</sub> | —   | 0.2 | —   | Ω    | TLP, 10A, t <sub>p</sub> = 100ns                          |
| Breakdown Voltage                | V <sub>BR</sub>  | 6   | —   | 10  | V    | I <sub>R</sub> = 1mA                                      |
| Channel Input Capacitance        | C <sub>T</sub>   | —   | 5.5 | —   | pF   | V <sub>R</sub> = 0V, f = 1MHz                             |

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.  
6. Short duration pulse test used to minimize self-heating effect.

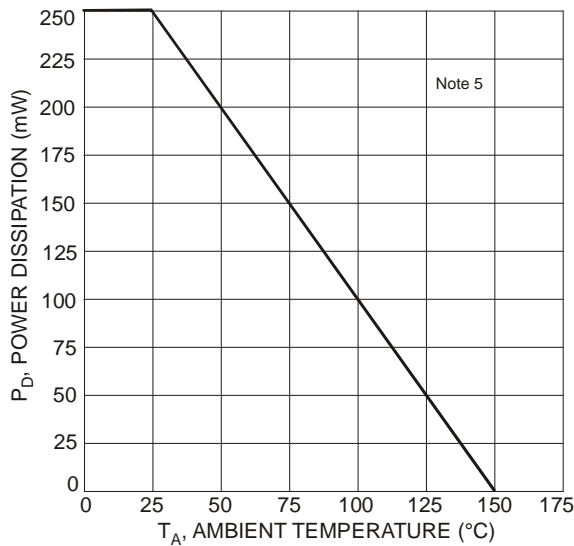


Figure 1 Power Derating Curve

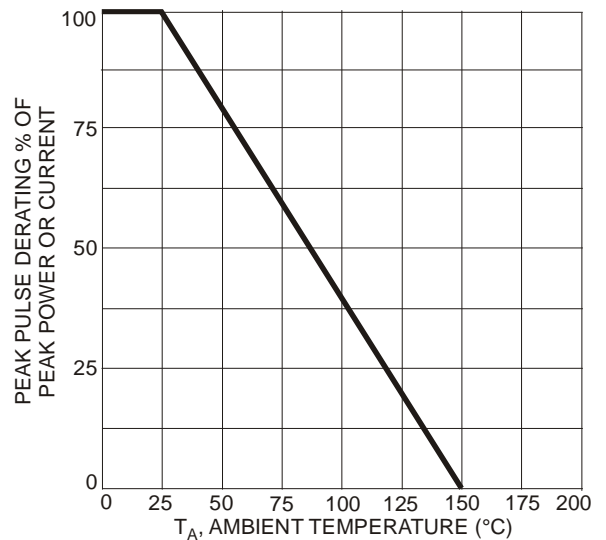
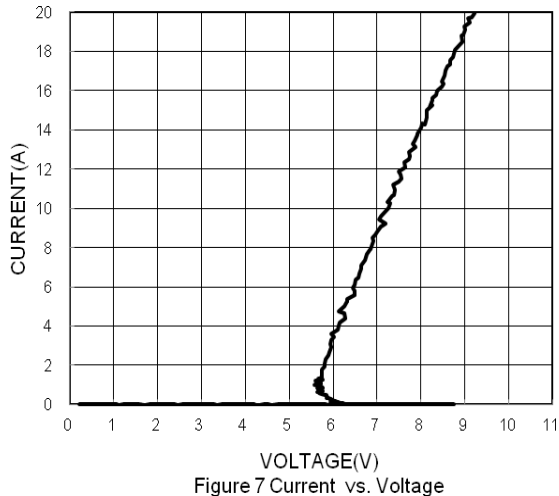
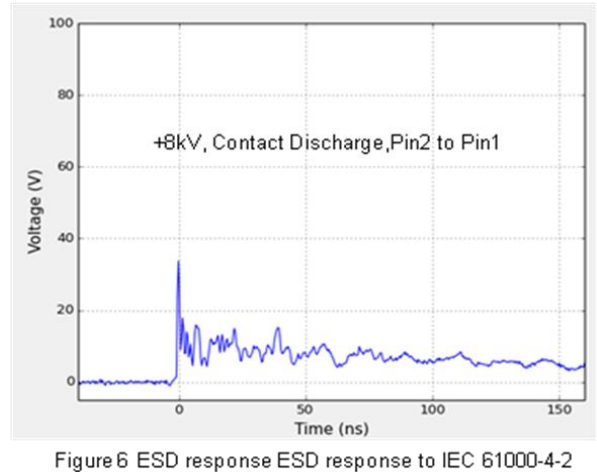
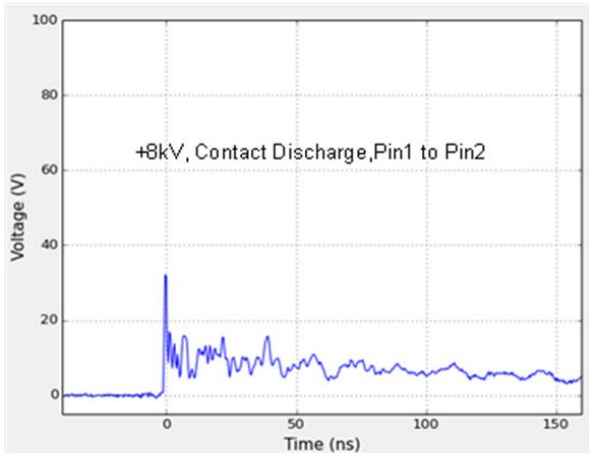
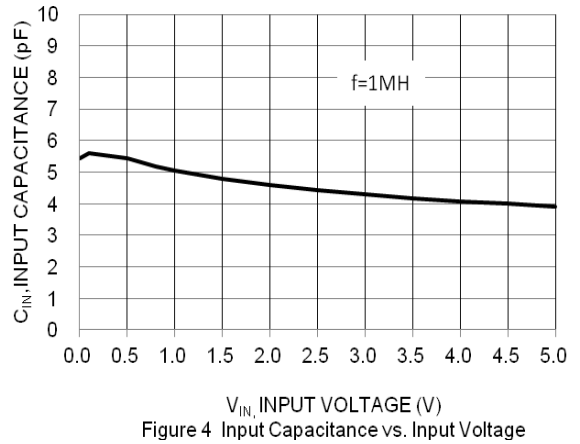
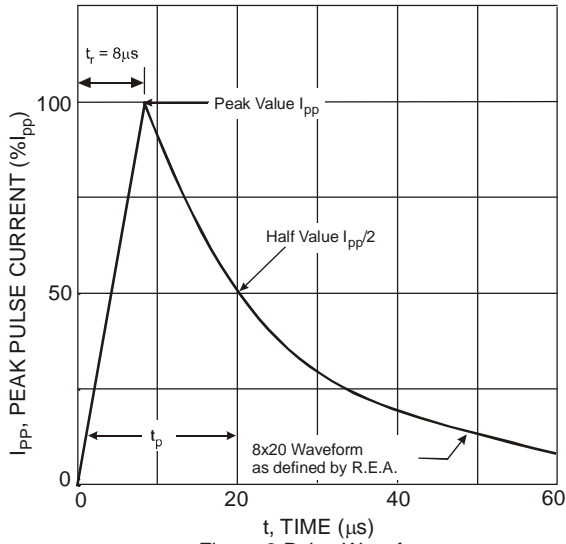


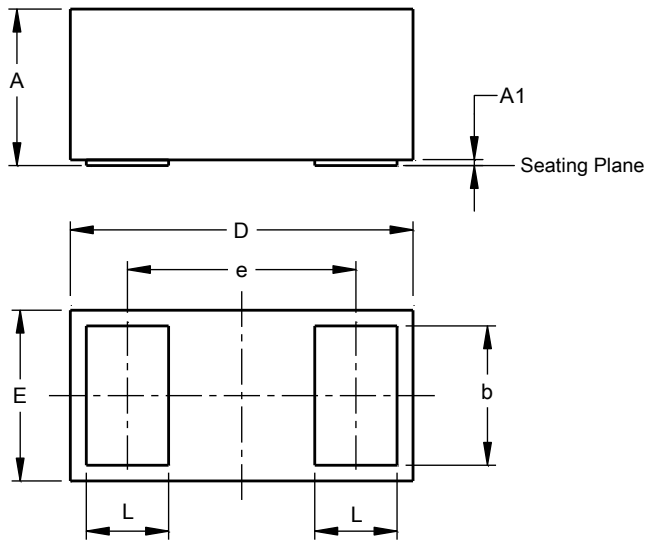
Figure 2 Pulse Derating Curve



**Package Outline Dimensions** (Note 7)

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

**X2-DSN0603-2**



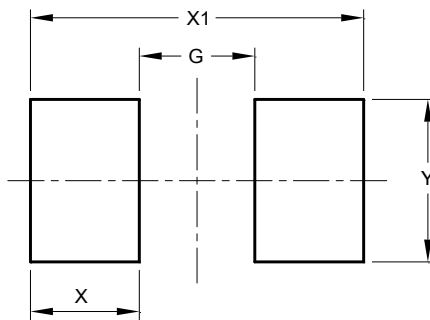
| X2-DSN0603-2         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.280 | 0.320 | 0.300 |
| A1                   | 0.00  | 0.020 | 0.010 |
| b                    | 0.220 | 0.260 | 0.240 |
| D                    | 0.575 | 0.625 | 0.600 |
| E                    | 0.275 | 0.325 | 0.300 |
| e                    | -     | -     | 0.400 |
| L                    | 0.120 | 0.160 | 0.140 |
| All Dimensions in mm |       |       |       |

Note: 7. Device side walls are electrically active bare silicon. Avoid contact of solder or flux on the side walls during the PCB assembly process.

**Suggested Pad Layout**

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

**X2-DSN0603-2**



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 0.206         |
| X          | 0.194         |
| Y          | 0.291         |
| X1         | 0.594         |

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