

Features

- Ultra-Small, Low Profile Leadless Surface Mount Package (0.6mm x 0.3mm x 0.3mm)
- Provides ESD Protection per IEC 61000-4-2 Standard: Air – ±30kV, Contact – ±30kV
- One Channel of ESD Protection
- Low Channel Input Capacitance
- Typically Used in Cellular Handsets, Portable Electronics, Communication Systems, Computers and Peripherals
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

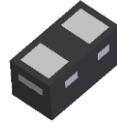
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Case: X3-DFN0603-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.0002 grams (Approximate)



Top View

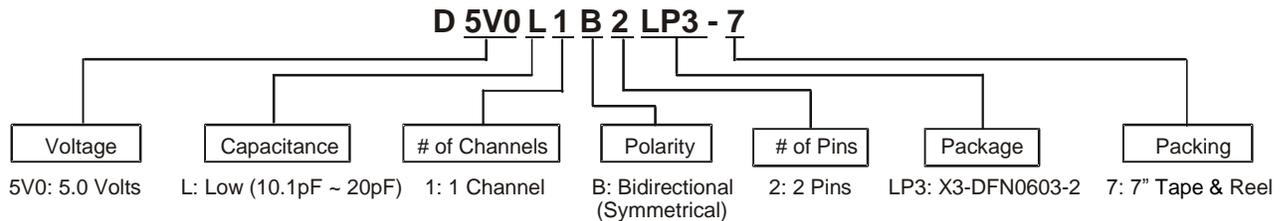


Bottom View



Device Schematic

Ordering Information (Note 4)

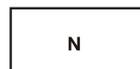


| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel |
|---------------|------------|---------|--------------------|-----------------|--------------------|
| D5V0L1B2LP3-7 | Standard | N | 7 | 8 | 10,000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

X3-DFN0603-2



N = Product Type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Conditions |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Power Dissipation | P _{PP} | 84 | W | 8/20μs, Per Fig. 1 |
| Peak Pulse Current | I _{PP} | 6 | A | 8/20μs, Per Fig. 1 |
| ESD Protection – Contact Discharge | V _{ESD_CONTACT} | ±30 | kV | Standard IEC 61000-4-2 |
| ESD Protection – Air Discharge | V _{ESD_AIR} | ±30 | kV | Standard IEC 61000-4-2 |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5) | P _D | 250 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 500 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---------------------------------------|------------------|-----|------|------|------|---|
| Reverse Standoff Voltage | V _{RWM} | — | — | 5 | V | — |
| Channel Leakage Current (Note 6) | I _{RM} | — | 10 | 100 | nA | V _{RWM} = 5V |
| Clamping Voltage, Positive Transients | V _{CL} | — | 7.0 | 9.0 | V | I _{PP} = 1A, t _p = 8/20μs, Figure 1 |
| | | — | 8.7 | 10.7 | | I _{PP} = 3A, t _p = 8/20μs, Figure 1 |
| | | — | 10.5 | 12.0 | | I _{PP} = 5A, t _p = 8/20μs, Figure 1 |
| | | — | 11.5 | 14.0 | | I _{PP} = 6A, t _p = 8/20μs, Figure 1 |
| Breakdown Voltage | V _{BR} | 6 | 7 | 8 | V | I _R = 1mA |
| Differential Resistance | R _{DIF} | — | 0.2 | — | Ω | I _R = 1A, t _p = 8/20μs |
| ESD Clamping Voltage (Note 7) | V _C | — | 9.6 | — | V | I _{PP} = 4A, t _p = 10/100ns |
| | | — | 16.0 | — | | I _{PP} = 16A, t _p = 10/100ns |
| Channel Input Capacitance | C _T | — | 15 | 18 | pF | V _R = 0V, f = 1MHz |
| | | — | 12.5 | — | | V _R = 2.5V, f = 1MHz |

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Short duration pulse test used to minimize self-heating effect.
 - Transmission Line Pulse Test (TLP) settings: t_p=100ns, t_r=10ns, I_{TLP} and V_{TLP} averaging window is from 70ns to 90ns.

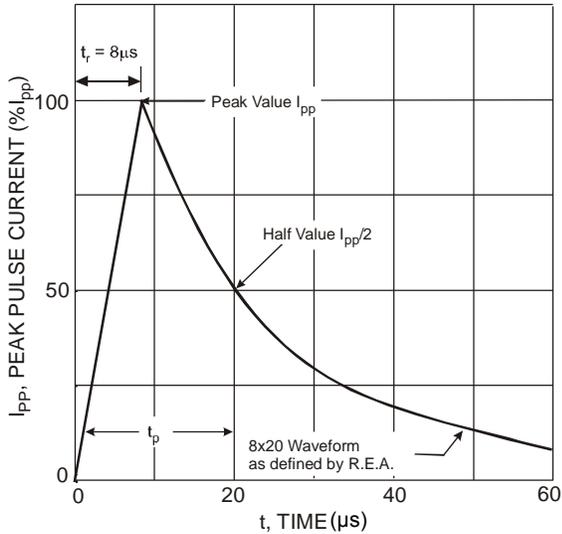


Figure 1 Pulse Waveform

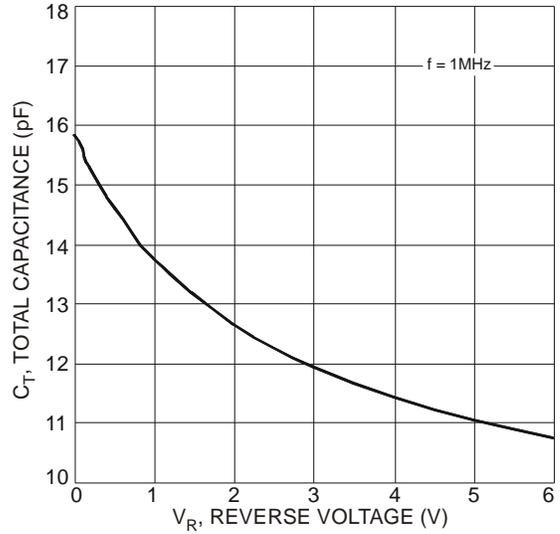


Figure 2 Typical Total Capacitance vs. Reverse Voltage

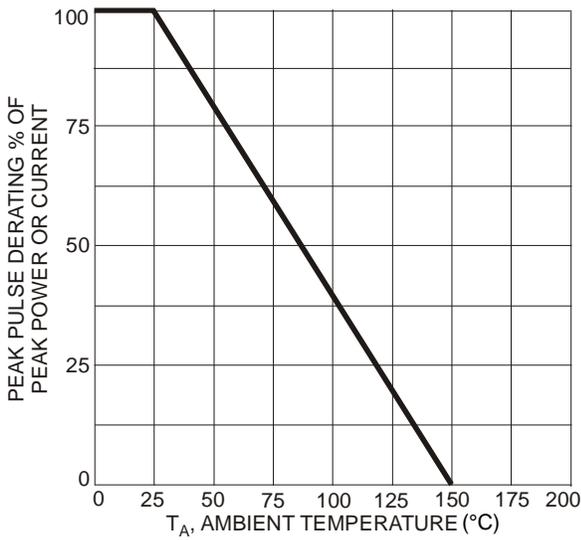


Figure 3 Pulse Derating Curve

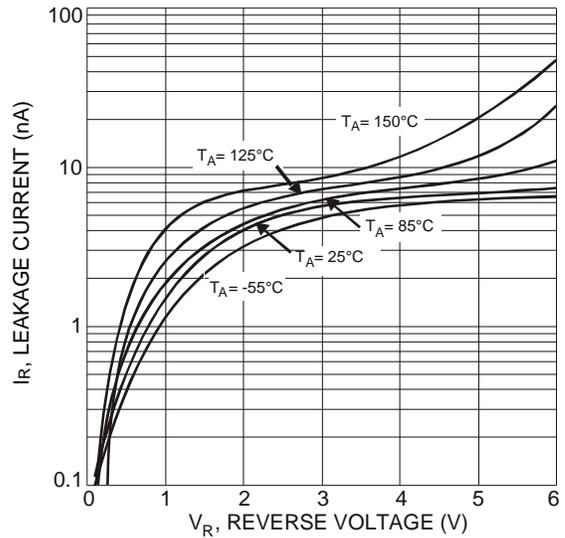


Figure 4 Typical Reverse Characteristics

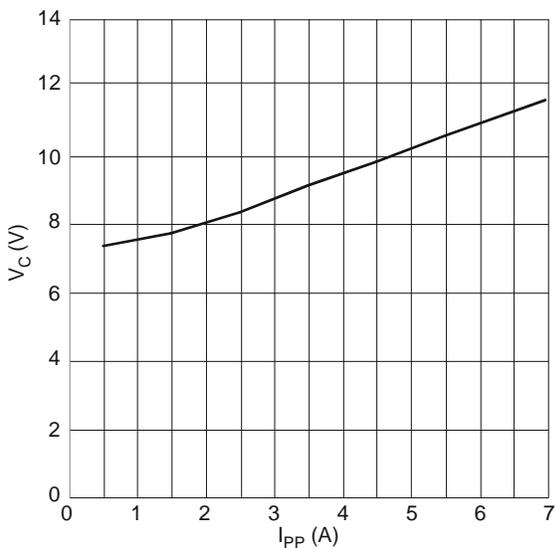


Figure 5 Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

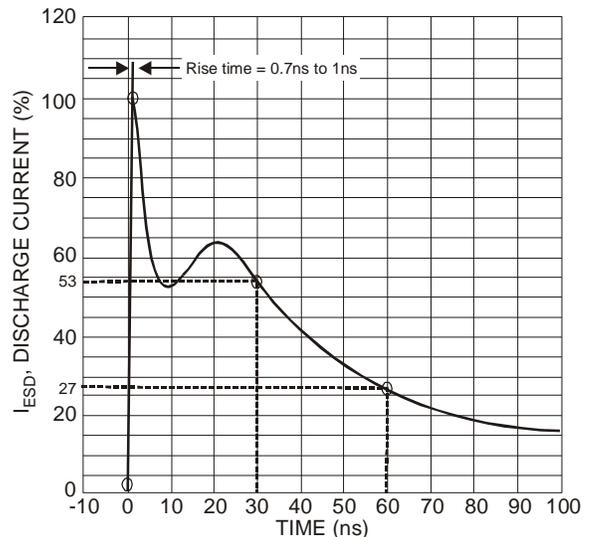


Figure 6 ESD Discharge Current Wave Form IEC 61000-4-2 (330Ω/150pF)

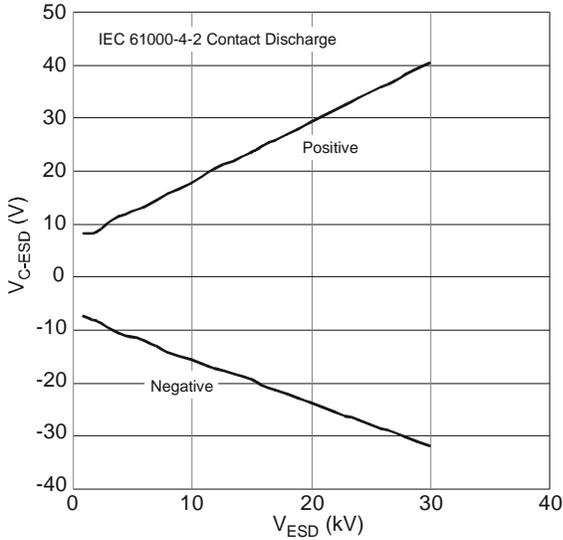


Figure 7 Typical Clamping Voltage vs. Contact Discharge Voltage

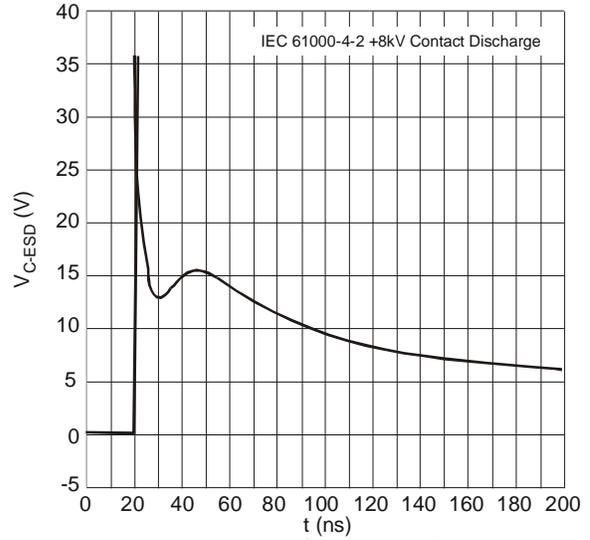


Figure 8 Typical Clamping Performance @ 8kV Contact Discharge

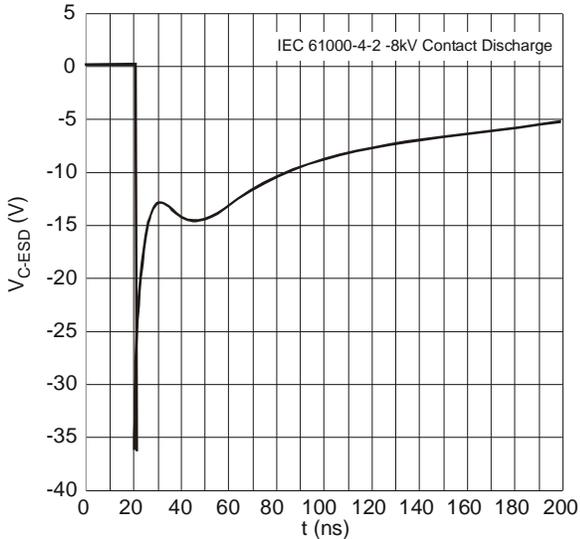


Figure 9 Typical Clamping Performance @ -8kV Contact Discharge

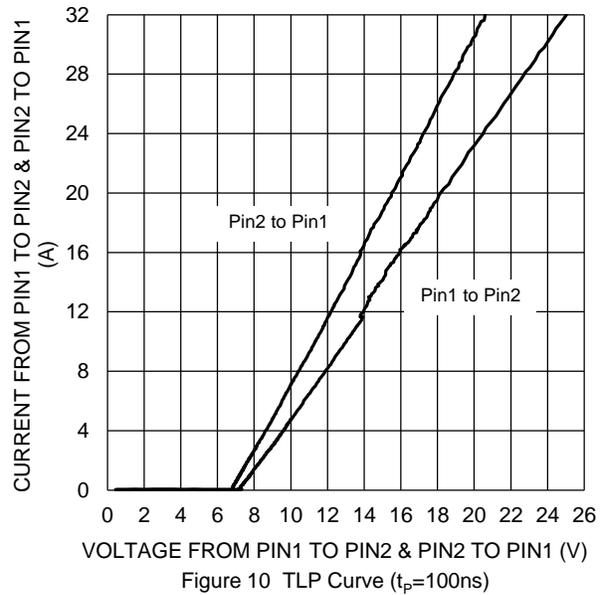
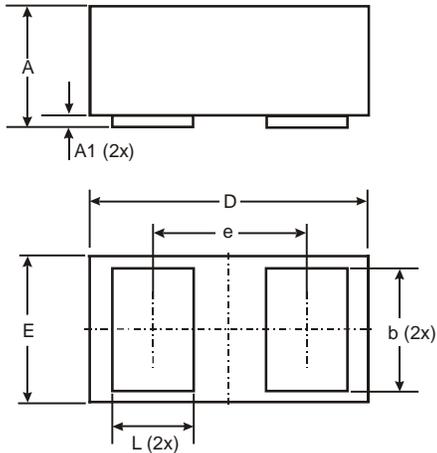


Figure 10 TLP Curve ($t_p=100\text{ns}$)

Package Outline Dimensions

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

X3-DFN0603-2

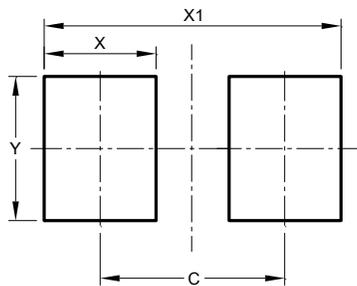


| X3-DFN0603-2 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.27 | 0.35 | 0.30 |
| A1 | 0.00 | 0.03 | 0.02 |
| b | 0.19 | 0.29 | 0.24 |
| D | 0.595 | 0.645 | 0.62 |
| E | 0.295 | 0.345 | 0.32 |
| e | - | - | 0.355 |
| L | 0.14 | 0.24 | 0.19 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

X3-DFN0603-2



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.380 |
| X | 0.230 |
| X1 | 0.610 |
| Y | 0.300 |

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