

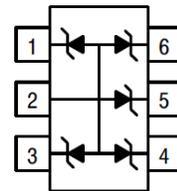
## Product Summary

|                             |                             |                            |
|-----------------------------|-----------------------------|----------------------------|
| <b>V<sub>BR</sub> (Min)</b> | <b>I<sub>PP</sub> (Max)</b> | <b>C<sub>T</sub> (Typ)</b> |
| 25.5V                       | 5A                          | 45pF                       |

## Description and Applications

This DESD24VS5U6SOQ is a next generation ESD and surge protection device packaged in a small footprint surface mount package. It is qualified to AEC-Q101, supported by a PPAP and is designed to protect two data lines of the Controller Area Network (CAN) in an automotive.

- CAN Bus Protection
- Industrial Control Network



Device Schematic

## Features

- 225W Peak Power Dissipation per Line (8/20 $\mu$ s Waveform)
- Provides ESD Protection per IEC 61000-4-2 Standard: Air  $\pm$ 20kV, Contact  $\pm$ 15kV
- 5 Channels of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DESD24VS5U6SOQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

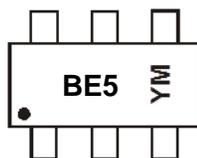
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals – Finish – Matte Tin Plated Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.016 grams (Approximate)

## Ordering Information (Note 4)

| Part Number      | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|------------------|------------|---------|--------------------|-----------------|-------------------|
| DESD24VS5U6SOQ-7 | Automotive | 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) & 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



BE5 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | H    | I    | J    | K    | L    | M    | N    | O    | P    | R    | S    | T    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Power Dissipation       | PPP                      | 225   | W    | 8/20μs, per Figure 1   |
| Peak Pulse Current                 | I <sub>PP</sub>          | 5     | A    | 8/20μs, per Figure 1   |
| ESD Protection – Contact Discharge | V <sub>ESD_Contact</sub> | ±15   | kV   | IEC 61000-4-2 Standard |
| ESD Protection – Air Discharge     | V <sub>ESD_Air</sub>     | ±20   | kV   | IEC 61000-4-2 Standard |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5)               | P <sub>D</sub>                    | 300         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 417         | °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> | —    | —   | 24  | V    | —   |
| Channel Leakage Current (Note 6)      | I <sub>RM</sub>  | —    | —   | 100 | nA   | V <sub>RWM</sub> = 24V                                  |
| Clamping Voltage, Positive Transients | V <sub>CL</sub>  | —    | —   | 33  | V    | I <sub>PP</sub> = 1A, t <sub>P</sub> = 8/20μs, Figure 1 |
|                                       |                  | —    | —   | 45  |      | I <sub>PP</sub> = 5A, t <sub>P</sub> = 8/20μs, Figure 1 |
| Breakdown Voltage                     | V <sub>BR</sub>  | 25.5 | 27  | 29  | V    | I <sub>R</sub> = 1mA                                    |
| Channel Input Capacitance             | C <sub>T</sub>   | —    | 45  | 70  | pF   | V <sub>R</sub> = 0V, f = 1MHz                           |

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown in Diodes Incorporated's package outline PDFs, 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.

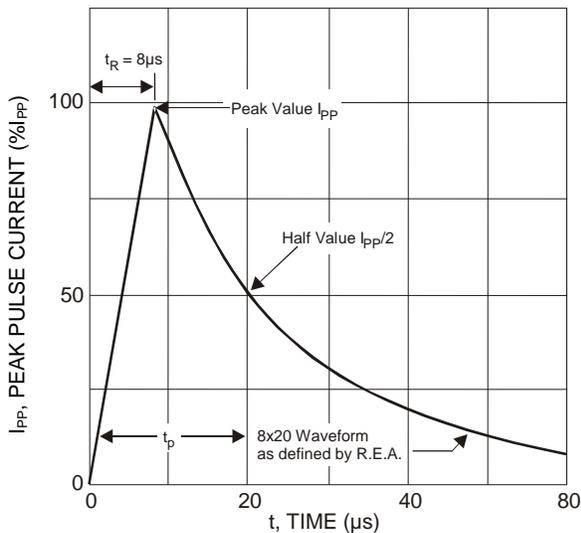


Figure 1 Pulse Waveform

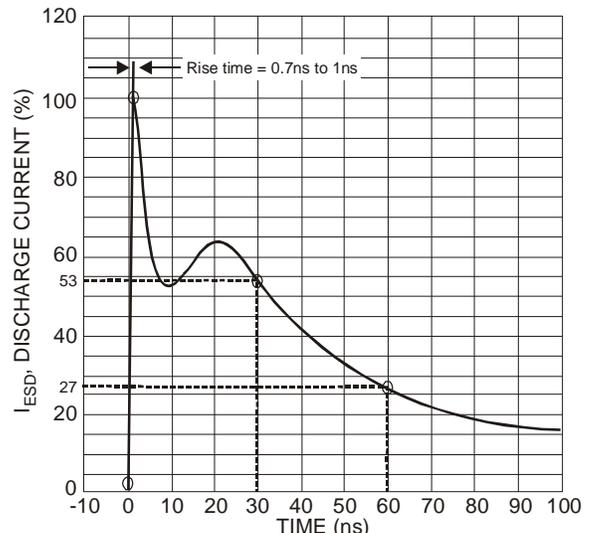


Figure 2 ESD Discharge Current Wave Form  
IEC 61000-4-2 (330Ω/150pF)

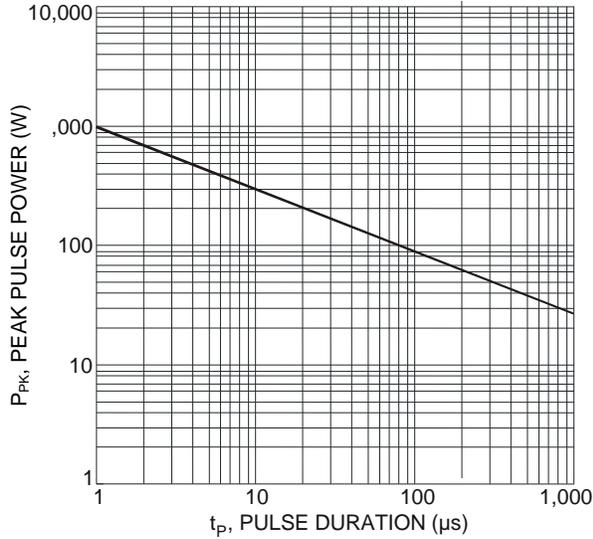


Figure 3 Peak Pulse Power vs. Pulse Duration

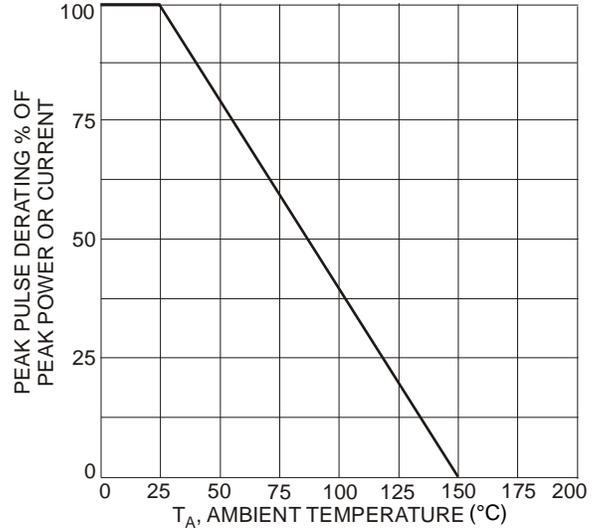


Figure 4 Pulse Derating Curve

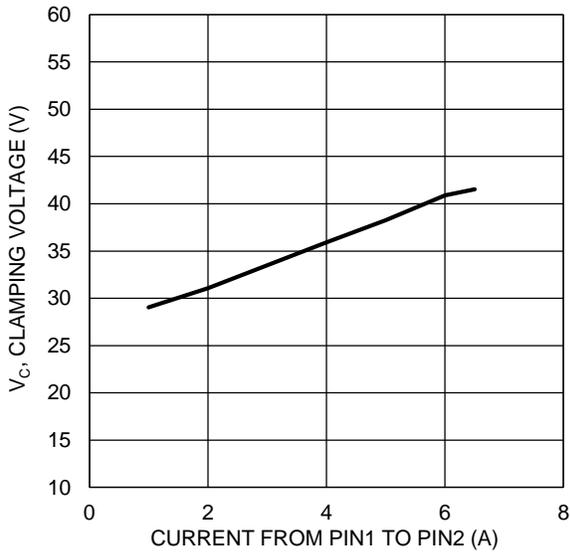


Figure 5 Clamping Voltage Characteristic (tp = 8/20μs)

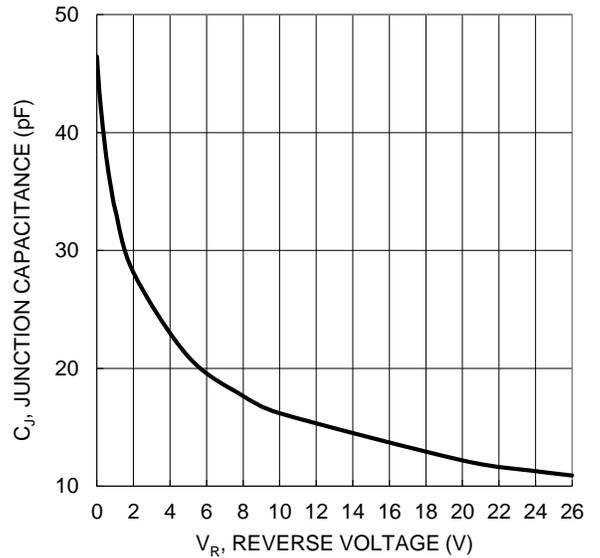


Figure 6 Typical Junction Capacitance

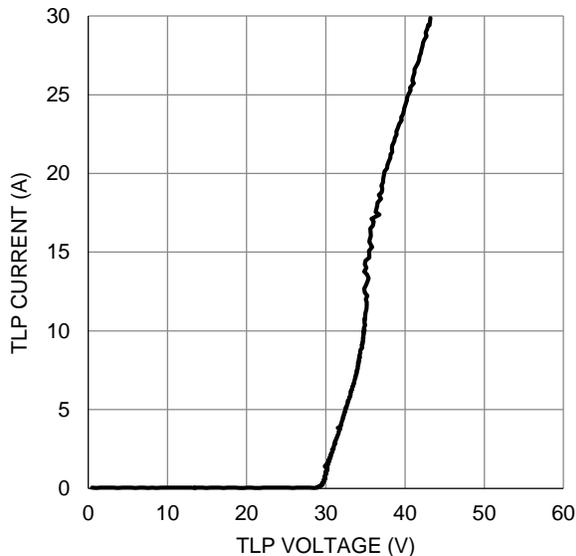
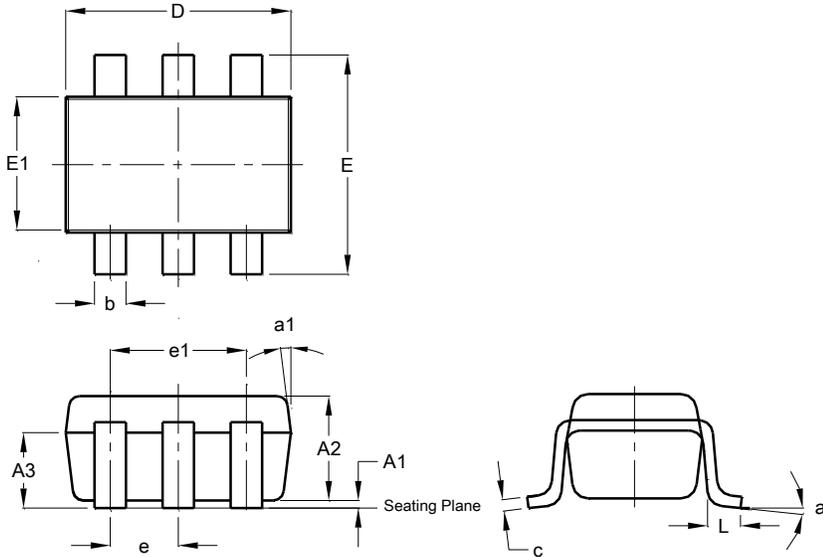


Figure 7 TLP Curve, Pin1 to Pin2 (tp = 100ns)

**Package Outline Dimensions**

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

**SOT26**

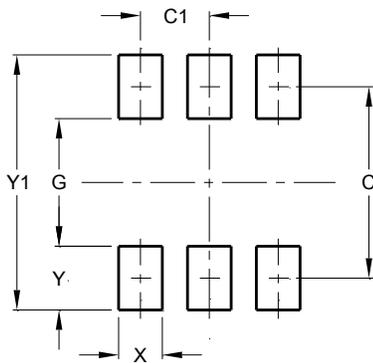


| SOT26                |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A1                   | 0.013 | 0.10 | 0.05 |
| A2                   | 1.00  | 1.30 | 1.10 |
| A3                   | 0.70  | 0.80 | 0.75 |
| b                    | 0.35  | 0.50 | 0.38 |
| c                    | 0.10  | 0.20 | 0.15 |
| D                    | 2.90  | 3.10 | 3.00 |
| e                    | -     | -    | 0.95 |
| e1                   | -     | -    | 1.90 |
| E                    | 2.70  | 3.00 | 2.80 |
| E1                   | 1.50  | 1.70 | 1.60 |
| L                    | 0.35  | 0.55 | 0.40 |
| a                    | -     | -    | 8°   |
| a1                   | -     | -    | 7°   |
| All Dimensions in mm |       |      |      |

**Suggested Pad Layout**

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

**SOT26**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.40          |
| C1         | 0.95          |
| G          | 1.60          |
| X          | 0.55          |
| Y          | 0.80          |
| Y1         | 3.20          |

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