

Product Summary

| V_{BR} (min) | I_{PP} (max) | C_T (typ) |
|----------------|----------------|-------------|
| 25.4 | 5A | 25pF |

Features

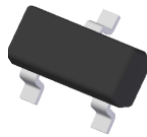
- 230 W Peak Power Dissipation per Line (8/20 μ s Waveform)
- Provides ESD Protection per IEC 61000-4-2 Standard:
Air ± 30 kV, Contact ± 30 kV
- 2 Channels of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability PPAP Capable (Note 4)**

Description and Applications

This DESD2CAN2SOQ 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

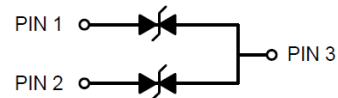
SOT23



Bottom View

Mechanical Data

- Case: SOT23
- 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 Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 (93)
- Weight: 0.009 grams (Approximate)



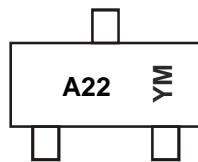
Device Schematic

Ordering Information (Note 5)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| DESD2CAN2SOQ-7 | Automotive | A22 | 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



A22 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: B = 2014)
 M = Month (ex: 9 = September)

Date Code Key

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|
| Code | B | C | D | E | F | G | H |

| 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 Power Dissipation | P _{PP} | 230 | W | 8/20μs, per Figure 1 |
| Peak Pulse Current | I _{PP} | 5 | A | 8/20μs, per Figure 1 |
| ESD Protection – Contact Discharge | V _{ESD_Contact} | ±30 | kV | IEC 61000-4-2 Standard |
| ESD Protection – Air Discharge | V _{ESD_Air} | ±30 | kV | IEC 61000-4-2 Standard |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 6) | P _D | 300 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 417 | °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} | — | — | 24 | V | — |
| Channel Leakage Current (Note 7) | I _{RM} | — | <1 | 10 | nA | V _{RWM} = 24V |
| Clamping Voltage, Positive Transients | V _{CL} | — | — | 34 | V | I _{PP} = 1A, t _p = 8/20μs, Figure 1 |
| | | — | — | 41 | | I _{PP} = 5A, t _p = 8/20μs, Figure 1 |
| Breakdown Voltage | V _{BR} | 25.4 | 28.0 | 30.3 | V | I _R = 1mA |
| Differential Resistance | R _{DIF} | — | 0.4 | — | Ω | I _R = 1A, t _p = 8/20μs |
| Channel Input Capacitance | C _T | — | 25 | 30 | pF | V _R = 0V, f = 1MHz |

Notes: 6. Device mounted on FR-4 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>.

7. Short duration pulse test used to minimize self-heating effect.

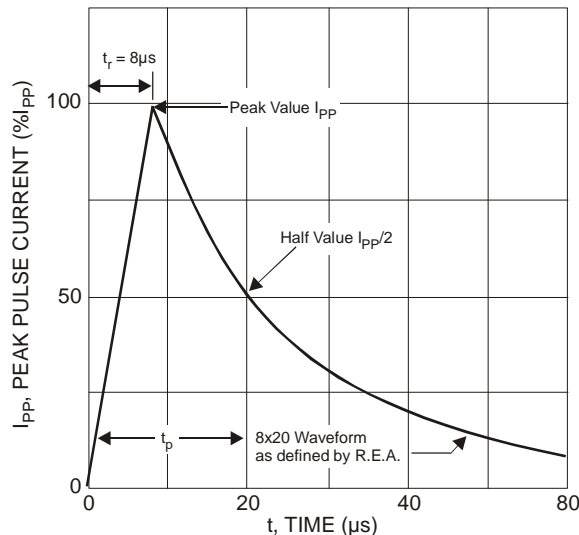


Figure 1 Pulse Waveform

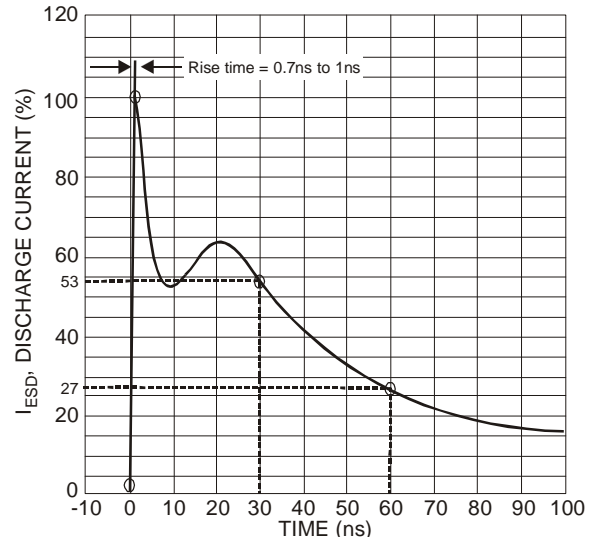


Figure 2 ESD Discharge Current Wave Form
IEC 6100-4-2 (330Ω/150pF)

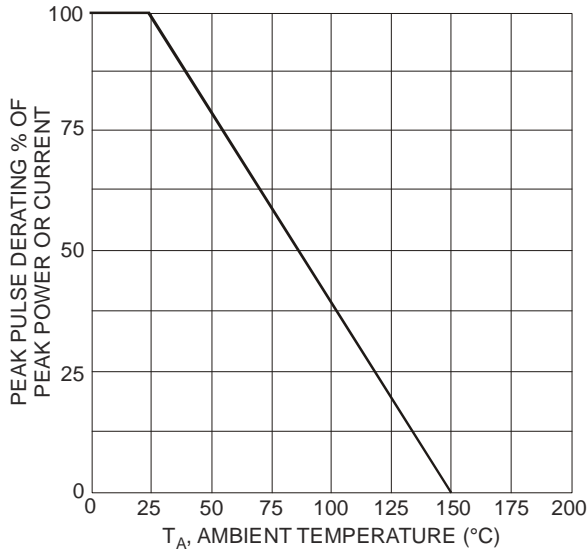


Figure 3 Power Dissipation vs. Ambient Temperature

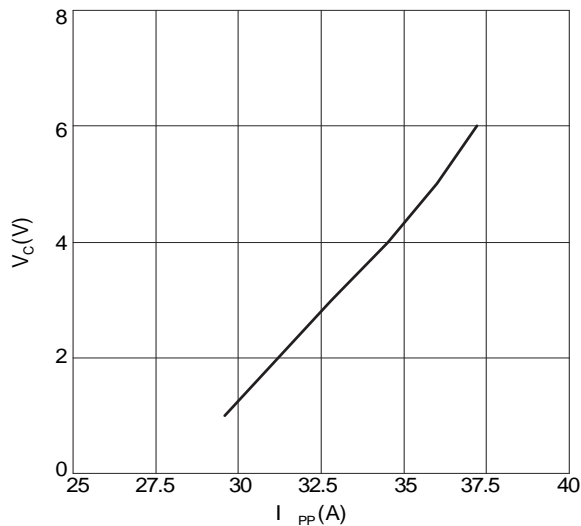
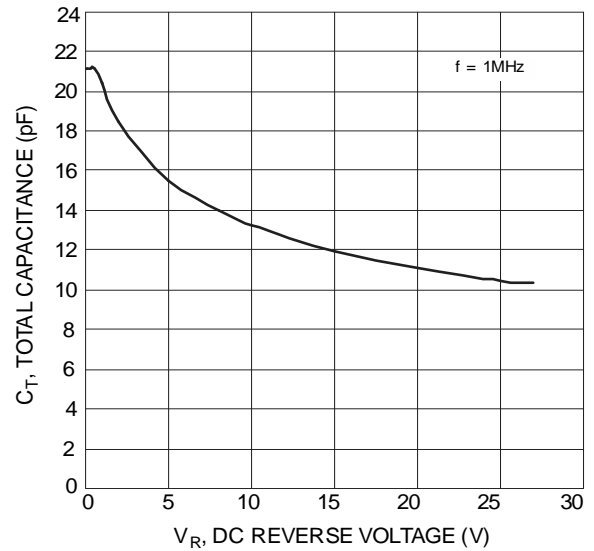

 Figure 5 Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}


Figure 4 Total Capacitance vs. Reverse Voltage

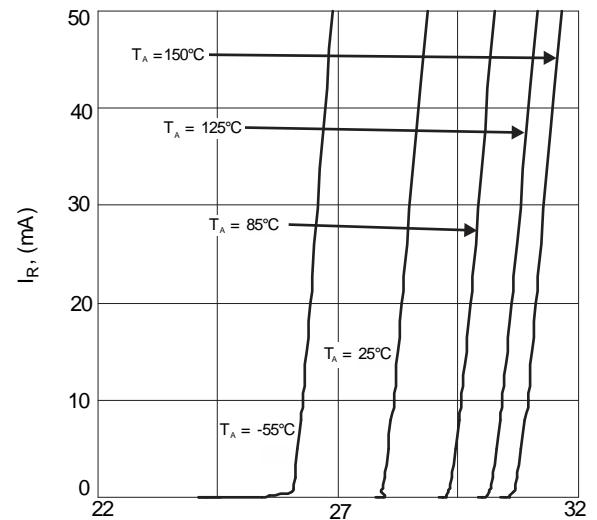
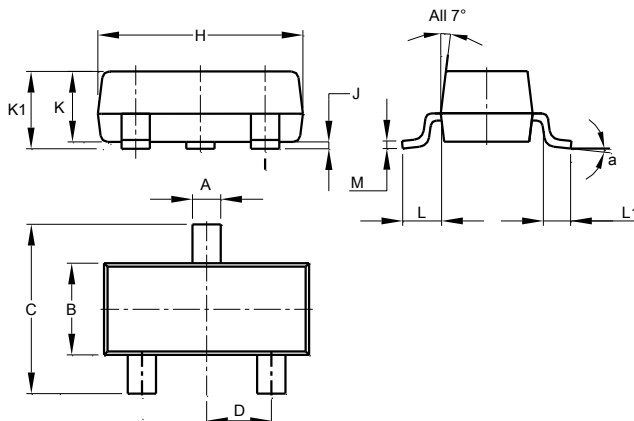


Figure 6 Reverse Current as a Function of Reverse Voltage

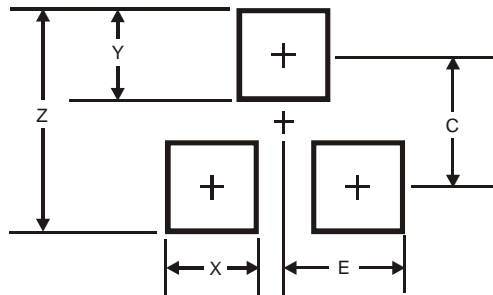
Package Outline Dimensions

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


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.890 | 1.00 | 0.975 |
| K1 | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L1 | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| a | 8° | | |
| 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) |
|------------|---------------|
| Z | 2.9 |
| X | 0.8 |
| Y | 0.9 |
| C | 2.0 |
| E | 1.35 |

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