

## Product Summary

| $V_R(V)$ | $I_F(A)$ | $V_F \text{ MAX}(V)$<br>@ +25°C | $I_R \text{ MAX}(mA)$<br>@ +25°C |
|----------|----------|---------------------------------|----------------------------------|
| 40       | 1.0      | 0.55                            | 0.05                             |

## Description and Applications

This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as :

- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

## Features and Benefits

- Ultra-Small Surface Mount Package
- Guard Ring Die Construction for Transient Protection
- High Surge Capability
- **Lead-Free Finish; 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)**

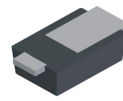
## Mechanical Data

- Case: POWERDI323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity: Cathode Band
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.006 grams (approximate)

POWERDI323



Top View



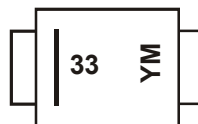
Bottom View

## Ordering Information (Note 5)

| Part Number | Compliance | Case       | Packaging        |
|-------------|------------|------------|------------------|
| PD3S140Q-7  | Automotive | POWERDI323 | 3000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See <http://www.diodes.com> 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/](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



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

### Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    | N    |

| 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.)

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitance load, derate current by 20%.

| Characteristic                                                                                   | Symbol             | Value | Unit |
|--------------------------------------------------------------------------------------------------|--------------------|-------|------|
| Peak Repetitive Reverse Voltage                                                                  | V <sub>RRM</sub>   | 40    | V    |
| Working Peak Reverse Voltage                                                                     | V <sub>RWM</sub>   |       |      |
| DC Blocking Voltage                                                                              | V <sub>R</sub>     |       |      |
| Average Forward Current (See also figure 4)                                                      | I <sub>F(AV)</sub> | 1.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load | I <sub>FSM</sub>   | 22    | A    |

## Thermal Characteristics

| Characteristic                                      | Symbol                            | Typ         | Max | Unit |
|-----------------------------------------------------|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Soldering Point      | R <sub>θJS</sub>                  | —           | 15  | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 175         | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) | R <sub>θJA</sub>                  | 130         | —   | °C/W |
| Operating and Storage Temperature Range             | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 |     | °C   |

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

| Characteristic                        | Symbol             | Min | Typ  | Max  | Unit | Test Condition                               |
|---------------------------------------|--------------------|-----|------|------|------|----------------------------------------------|
| Reverse Breakdown Voltage (Note 8)    | V <sub>(BR)R</sub> | 40  | —    | —    | V    | I <sub>R</sub> = 100μA                       |
| Forward Voltage                       | V <sub>F</sub>     | —   | 0.37 | 0.42 | V    | I <sub>F</sub> = 0.1A                        |
|                                       |                    | —   | 0.44 | 0.50 |      | I <sub>F</sub> = 0.5A                        |
|                                       |                    | —   | 0.46 | 0.52 |      | I <sub>F</sub> = 0.7A                        |
|                                       |                    | —   | 0.49 | 0.55 |      | I <sub>F</sub> = 1.0A                        |
| Leakage Current (Note 8)              | I <sub>R</sub>     | —   | 0.3  | 4    | μA   | V <sub>R</sub> = 5V, T <sub>A</sub> = +25°C  |
|                                       |                    | —   | 2    | 50   |      | V <sub>R</sub> = 40V, T <sub>A</sub> = +25°C |
| Total Capacitance (See also figure 3) | C <sub>T</sub>     | —   | 32   | —    | pF   | V <sub>R</sub> = 10V, f = 1.0MHz             |

Notes: 6. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>. T<sub>A</sub> = +25°C.  
7. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>. T<sub>A</sub> = +25°C.  
8. Short duration pulse test used to minimize self-heating effect.

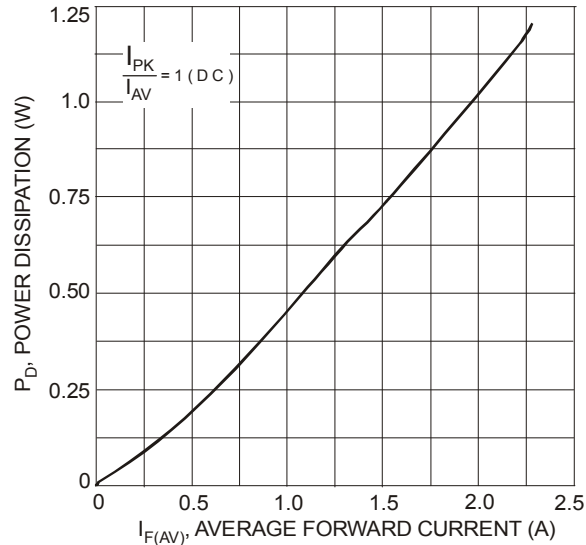


Figure 1 Forward Power Dissipation

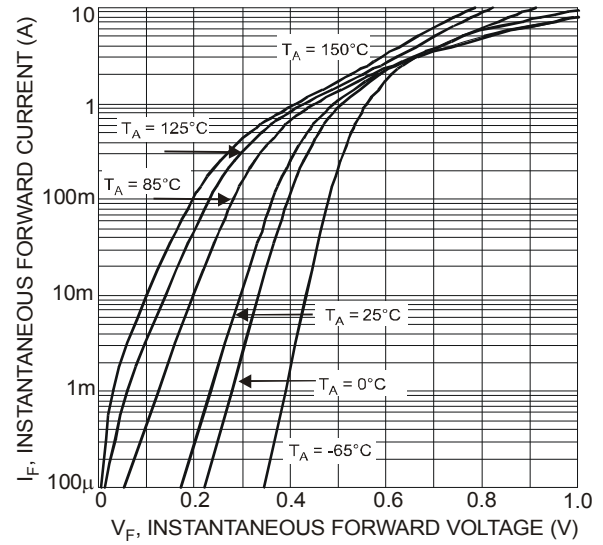


Figure 2 Typical Forward Characteristics

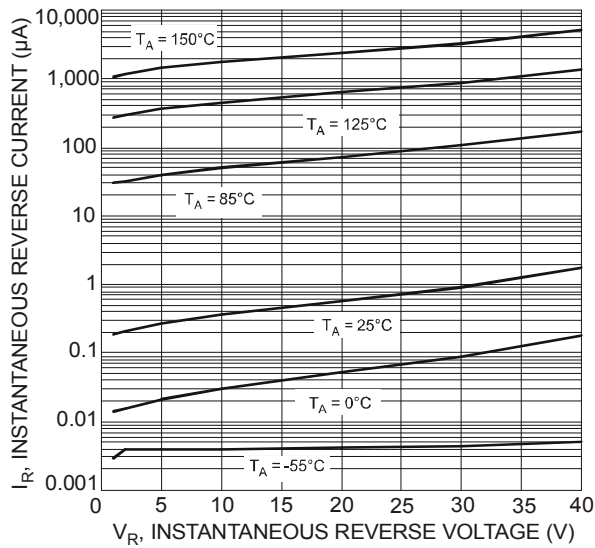


Figure 3 Typical Reverse Characteristics

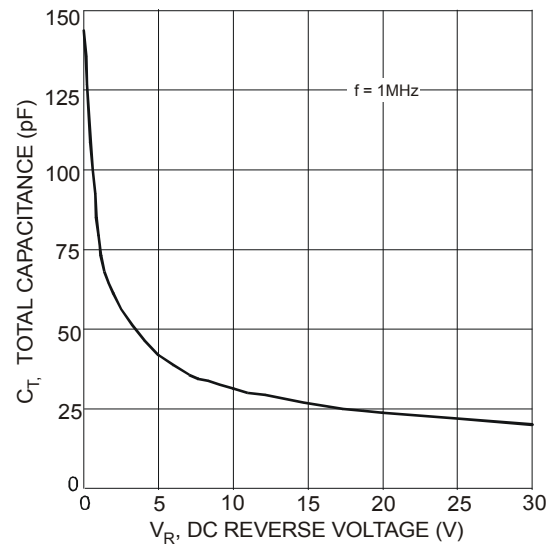


Figure 4 Total Capacitance vs. Reverse Voltage

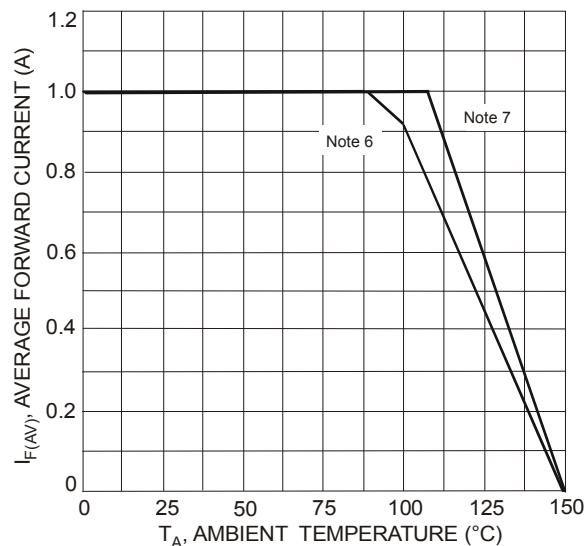


Figure 5 Forward Current Derating Curve

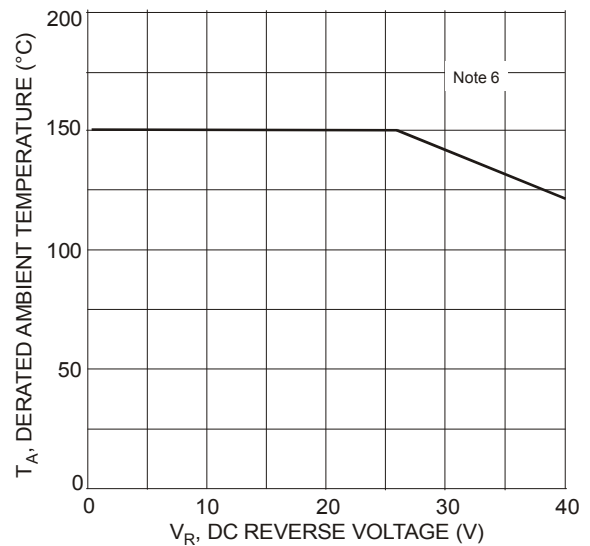
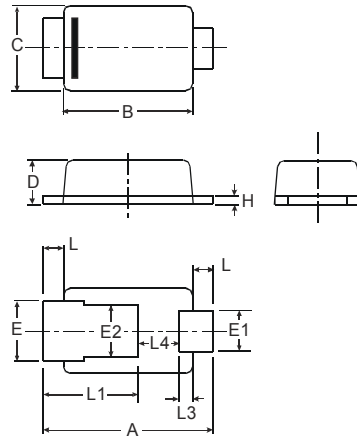


Figure 6 Operating Temperature Derating

## Package Outline Dimensions

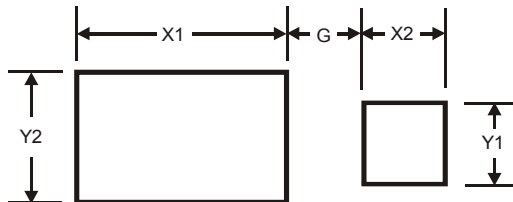
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| POWERDI323           |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 2.40 | 2.60 | 2.50 |
| B                    | 1.85 | 1.95 | 1.90 |
| C                    | 1.20 | 1.30 | 1.25 |
| D                    | 0.60 | 0.70 | 0.65 |
| E                    | 0.78 | 0.98 | 0.88 |
| E1                   | 0.50 | 0.70 | 0.60 |
| E2                   | 0.60 | 1.00 | 0.80 |
| H                    | 0.08 | 0.18 | 0.13 |
| L                    | 0.20 | 0.40 | 0.30 |
| L1                   | —    | —    | 1.40 |
| L3                   | —    | —    | 0.20 |
| L4                   | 0.40 | 0.80 | 0.60 |
| 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) |
|------------|---------------|
| G          | 0.5           |
| X1         | 2.0           |
| X2         | 0.8           |
| Y1         | 0.8           |
| Y2         | 1.1           |

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