

**1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER  
 POWERDI®323**
**Product Summary**

| $V_R$ (V) | $I_F$ (A) | $V_{F\text{ MAX}}$ (V)<br>@ +25°C | $I_{R\text{ MAX}}$ (mA)<br>@ +25°C |
|-----------|-----------|-----------------------------------|------------------------------------|
| 60        | 1.0       | 0.64                              | 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

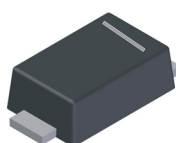
**Features and Benefits**

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

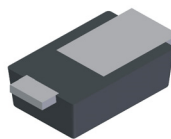
**Mechanical Data**

- 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 
- Weight: 0.006 grams (approximate)

POWERDI323



Top View

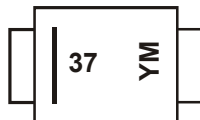


Bottom View

**Ordering Information (Note 5)**

| Part Number | Compliance | Case       | Packaging        |
|-------------|------------|------------|------------------|
| PD3S160Q-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/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. 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**


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

**Date Code Key**

| Year  | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    |
| 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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage              | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 60    | V    |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub>                                    | 42    | V    |
| Average Forward Current (See also figure 4)                                                         | I <sub>F(AV)</sub>                                     | 1.0   | A    |
| Repetitive Peak Forward Current t <sub>p</sub> ≤ 1ms; δ ≤ 0.25                                      | I <sub>FRM</sub>                                       | 8     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>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>                  | —           | 6   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 173         | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) | R <sub>θJA</sub>                  | 125         | —   | °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> | 60  | —                 | —                    | V    | I <sub>R</sub> = 100μA                                                                      |
| Forward Voltage                       | V <sub>F</sub>     | —   | 0.40<br>0.55<br>— | 0.45<br>0.58<br>0.64 | V    | I <sub>F</sub> = 0.1A<br>I <sub>F</sub> = 0.7A<br>I <sub>F</sub> = 1.0A                     |
| Leakage Current (Note 8)              | I <sub>R</sub>     | —   | 0.3<br>3          | 5<br>50              | μA   | V <sub>R</sub> = 5V, T <sub>A</sub> = +25°C<br>V <sub>R</sub> = 60V, T <sub>A</sub> = +25°C |
| Total Capacitance (See also figure 3) | C <sub>T</sub>     | —   | 38                | —                    | 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.

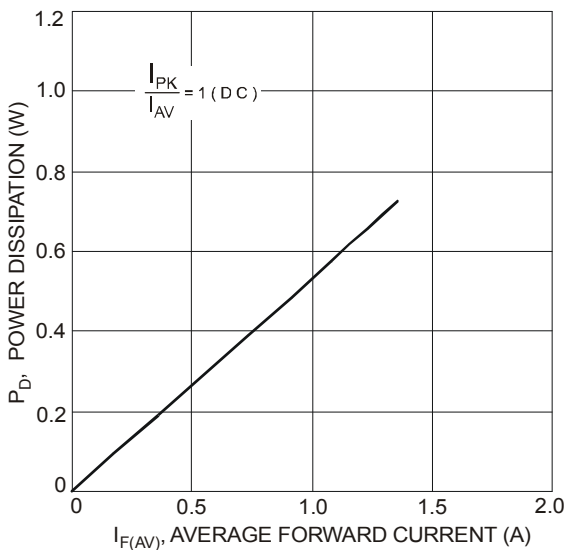


Figure 1 Forward Power Dissipation

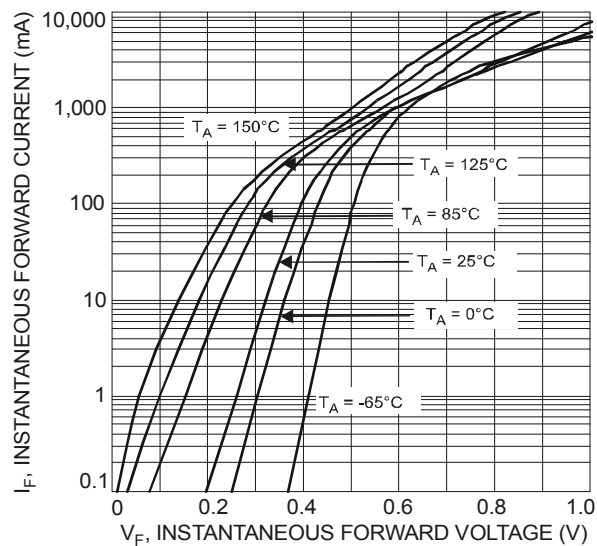


Figure 2 Typical Forward Characteristics

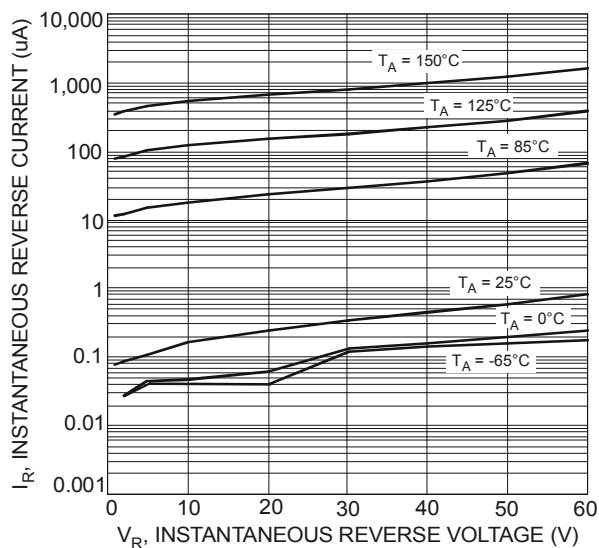


Figure 3 Typical Reverse Characteristics

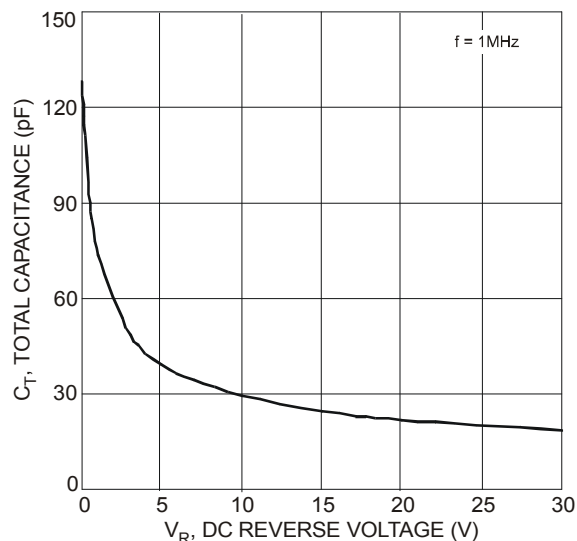


Figure 4 Total Capacitance vs. Reverse Voltage

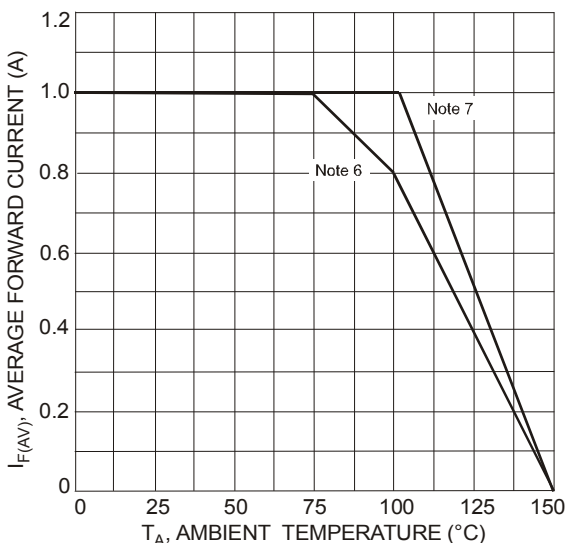


Figure 5 Forward Current Derating Curve

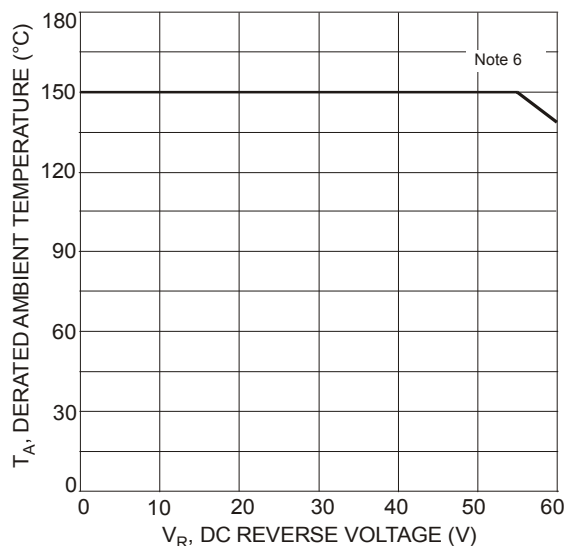
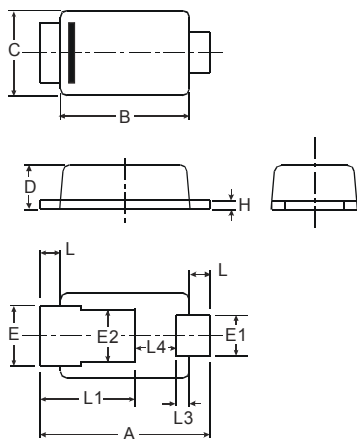


Figure 6 Operating Temperature Derating

## Package Outline Dimensions

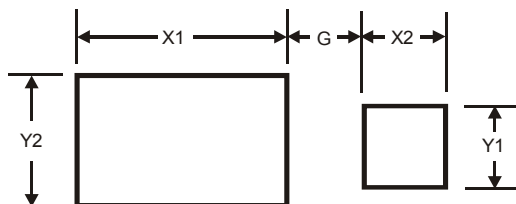
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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