



**THE DATASHEET OF  
SDM1L40P1-7**



## Product Summary

| $V_R$ (V) | $I_F$ (A) | $V_F$ Max (V)<br>@ +25°C | $I_R$ Max (mA)<br>@ +25°C |
|-----------|-----------|--------------------------|---------------------------|
| 40        | 1.0       | 0.45                     | 0.1                       |

## Description and Applications

This Schottky Barrier Rectifier is 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
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- High Current Capability and Low Forward Voltage Drop
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: PowerDI<sup>®</sup> 123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.096 grams (Approximate)

PowerDI123



Top View

## Ordering Information (Note 4)

| Part Number | Case       | Packaging         |
|-------------|------------|-------------------|
| SDM1L40P1-7 | PowerDI123 | 3,000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) 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

PowerDI123



1L40 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    | I    | J    |

| 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 capacitive 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 @ T <sub>T</sub> = +120°C   | I <sub>F(AV)</sub> | 1.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub>   | 60    | A    |

**Thermal Characteristics**

| Characteristic                                  | Symbol           | Typ         | Unit |
|---|------------------|-------------|------|
| Thermal Resistance Junction to Ambient (Note 5) | R <sub>θJA</sub> | 60          | °C/W |
| Thermal Resistance Junction to Case (Note 5)    | R <sub>θJC</sub> | 5           | °C/W |
| Storage Temperature Range                       | 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                                 |
|--------------------------|----------------|-----|------|------|------|--|
| Forward Voltage          | V <sub>F</sub> | —   | 0.40 | 0.45 | V    | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C  |
|                          |                | —   | 0.30 | —    |      | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +125°C |
| Leakage Current (Note 6) | I <sub>R</sub> | —   | —    | 0.1  | mA   | V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C   |
|                          |                | —   | 11   | —    |      | V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C  |
|                          |                | —   | —    | 0.05 |      | V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C   |
| Typical Capacitance      | C <sub>T</sub> | —   | 6.0  | —    | pF   | V <sub>R</sub> = 20V, T <sub>J</sub> = +125°C  |
|                          |                | —   | 63   | —    |      | V <sub>R</sub> = 10V, f = 1.0MHz               |

Notes: 5. Device mounted on 1inch sq. copper pad, 2oz.  
6. Short duration pulse test to minimize self-heating effect.

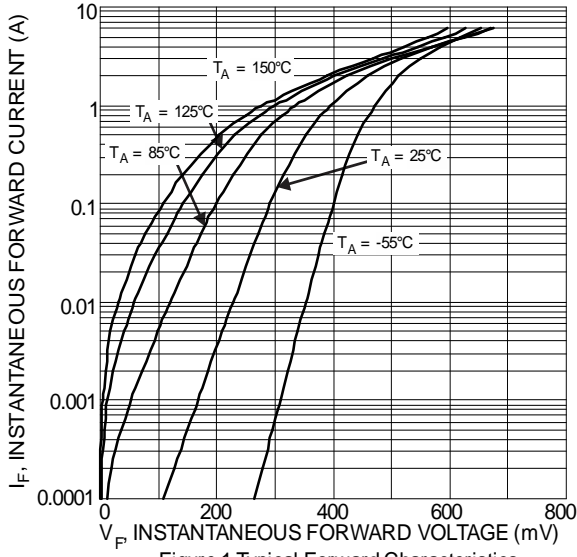


Figure 1 Typical Forward Characteristics

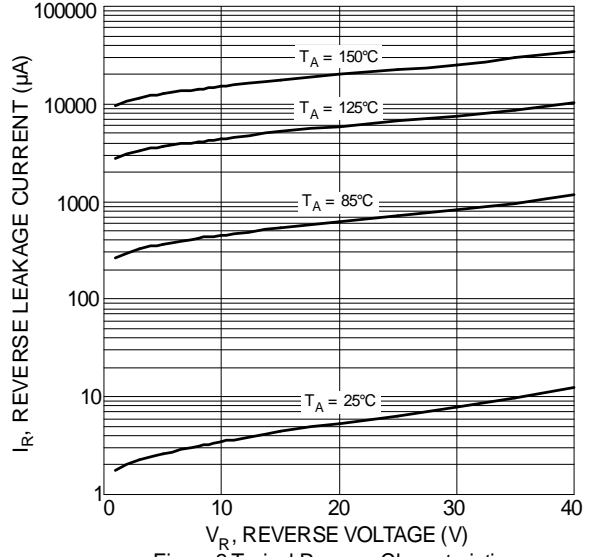


Figure 2 Typical Reverse Characteristics

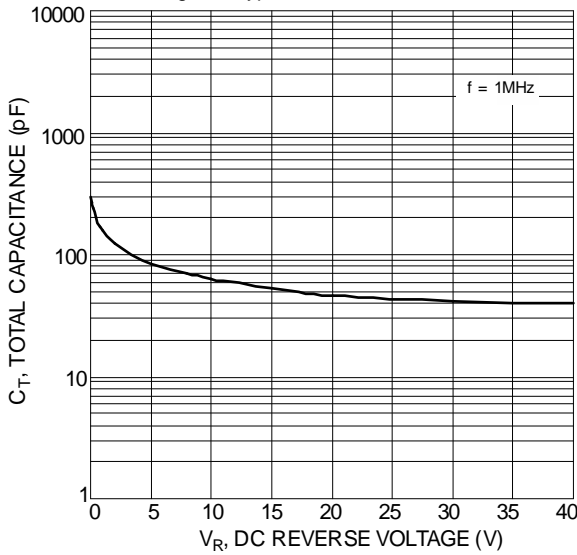


Figure 3 Total Capacitance vs. Reverse Voltage

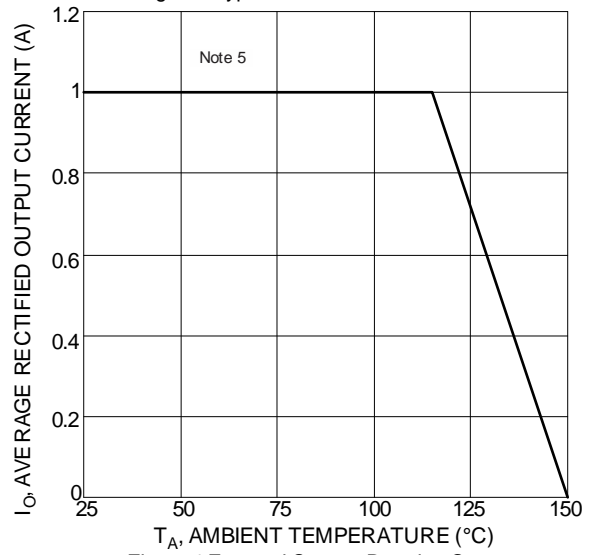
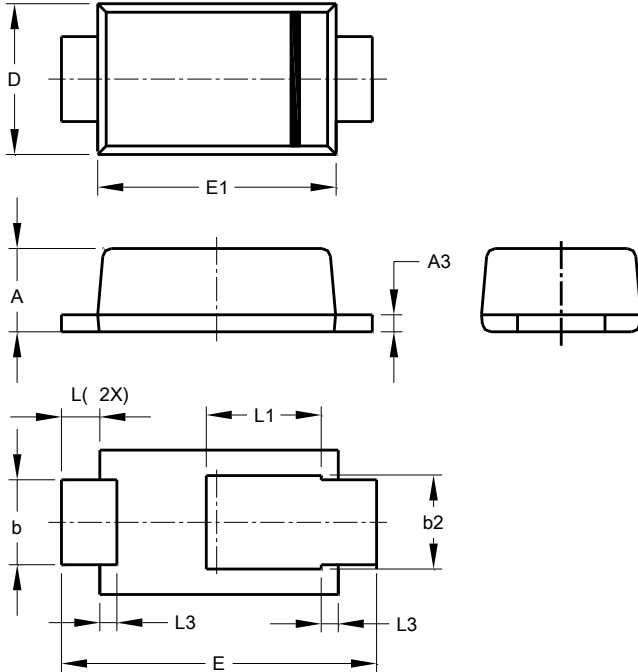


Figure 4 Forward Current Derating Curve

**Package Outline Dimensions**

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

**PowerDI123**

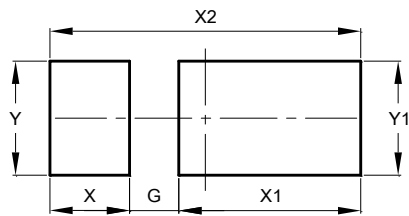


| PowerDI123           |       |       |      |
|----------------------|-------|-------|------|
| Dim                  | Min   | Max   | Typ  |
| A                    | 0.93  | 1.00  | 0.98 |
| A3                   | 0.15  | 0.25  | 0.20 |
| b                    | 0.85  | 1.25  | 1.00 |
| b2                   | 1.025 | 1.125 | 1.10 |
| D                    | 1.63  | 1.93  | 1.78 |
| E                    | 3.50  | 3.90  | 3.70 |
| E1                   | 2.60  | 3.00  | 2.80 |
| L                    | 0.40  | 0.50  | 0.45 |
| L1                   | 1.25  | 1.40  | 1.35 |
| L3                   | 0.125 | 0.275 | 0.20 |
| All Dimensions in mm |       |       |      |

**Suggested Pad Layout**

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

**PowerDI123**



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 0.65          |
| X          | 1.05          |
| X1         | 2.40          |
| X2         | 4.10          |
| Y          | 1.50          |
| Y1         | 1.50          |

NEW PRODUCT

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