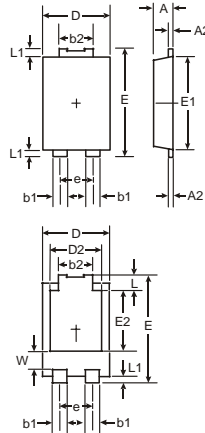


Announcing a Complete Line of Industry-Leading High-Efficiency Schottky Barrier Rectifiers in Our New PowerDI™5 Compact Power Package



| Dim                         | Min      | Max  |
|-----------------------------|----------|------|
| A                           | 1.05     | 1.15 |
| A2                          | 0.33     | 0.43 |
| b1                          | 0.80     | 0.99 |
| b2                          | 1.70     | 1.88 |
| D                           | 3.90     | 4.05 |
| D2                          | 3.05 NOM |      |
| E                           | 6.40     | 6.60 |
| e                           | 1.84 NOM |      |
| E1                          | 5.30     | 5.45 |
| E2                          | 3.55 NOM |      |
| L                           | 0.75     | 0.95 |
| L1                          | 0.50     | 0.65 |
| W                           | 1.20     | 1.50 |
| <b>All Dimensions in mm</b> |          |      |



Patent-pending flat lead frame heat-sink solder pad results in higher power dissipation and surge capabilities in a compact low profile package

### Product Highlights

- **PDS1040 and PDS1040CTL:** Unparalleled Efficiency -- low forward voltage drop, exceptionally low leakage current. PDS1040 is up to 67% more efficient than competitive products, PDS1040CTL up to 79% more efficient for switch-mode power supplies operating at an ambient temperature of 125°C.
- **PDS835L and PDS1040L:** Very low forward voltage drop, highly efficient for heavy load or high duty cycle applications.
- **PDS3100 and PDS5100:** Ideally suited for high voltage applications. Expansion to previously announced high-voltage series.
- **PDS340 and PDS540:** More compact, highly efficient replacements for SMC or DPAK products.
- All PowerDI™5 products are qualified to rigorous AEC-Q101 standards to ensure high reliability.

### Availability

- **Samples & Stock:** - The following are Available Now!

**PDS3100 PDS340 PDS5100 PDS540**  
**PDS1040 PDS1040L PDS1040CTL PDS835L**

- **Data Sheets Available NOW at:** [www.diodes.com](http://www.diodes.com)

To download selected data sheet, enter p/n in our website Product Data Sheet search, or click:

|   |  |
|---|--|
| <a href="#">PDS3100</a> 3 Ampere, 100V Schottky | <a href="#">PDS1040</a> 10 Ampere, 40V Schottky                  |
| <a href="#">PDS340</a> 3 Ampere, 40V Schottky   | <a href="#">PDS1040L</a> 10 Ampere, 40V Low $V_F$ Schottky       |
| <a href="#">PDS5100</a> 3 Ampere, 100V Schottky | <a href="#">PDS1040CTL</a> 2 by 5 Ampere, 40V Low $V_F$ Schottky |
| <a href="#">PDS540</a> 5 Ampere, 40V Schottky   | <a href="#">PDS835L</a> 8 Ampere, 35V Low $V_F$ Schottky         |

## Crosses to Other Manufacturers' Parts

- Like Diodes, Inc.'s Powermite®3 products, Diodes' "New" PowerDI™5 products are more compact, higher performance replacements for the following competitor products:

| Diodes, Inc. | Vishay-GS        |                               | ON Semi                         |         | ST Micro      |                    | International Rectifier |         |
|--------------|------------------|-------------------------------|---------------------------------|---------|---------------|--------------------|-------------------------|---------|
| Part Number  | Part Number      | Package                       | Part Number                     | Package | Part Number   | Package            | Part Number             | Package |
| PDS340       | SS32, SS33, SS34 | SMC (DO-214AB)                | MBRS320T3, MBRS330T3, MBRS340T3 | SMC     | -             | -                  | 30BQ040, MBRS340TR      | SMC     |
| PDS3100      | No equivalent    | -                             | -                               | -       | No equivalent | -                  | -                       | -       |
| PDS540       | -                | -                             | -                               | -       | No equivalent | -                  | -                       | -       |
| PDS5100      | No equivalent    | -                             | No equivalent                   | -       | -             | -                  | -                       | -       |
| PDS835L      | No equivalent    | -                             | MBRD835L                        | DPAK    | No equivalent | -                  | -                       | -       |
| PDS1040      | SBLB1040         | D <sup>2</sup> PAK (TO-263AB) | MBRD835L                        | DPAK    | No equivalent | -                  | -                       | -       |
| PDS1040L     | SBLB1040         | D <sup>2</sup> PAK (TO-263AB) | MBRD835L                        | DPAK    | No equivalent | -                  | No equivalent           | -       |
| PDS1040CTL   | SBLB1040CT       | D <sup>2</sup> PAK (TO-263AB) | MBRD1035CTL                     | DPAK    | STPS10L40CG   | D <sup>2</sup> PAK | No equivalent           | -       |

## Exceptional Efficiency

For 50% duty cycle, 25°C operation\*

- **PDS1040** is 94% more efficient than ON MBRD835L
- **PDS1040** is 47% more efficient than Vishay SBLB1040
- **PDS1040CTL** is 79% more efficient than STM STPS10L40CG
- **PDS1040CTL** is 98% more efficient than ON MBRD1035CTL
- **PDS1040CTL** is 71% more efficient than Vishay SBLB1040CT

For 50% duty cycle, 125°C operation\*

- **PDS1040** is 67% more efficient than ON MBRD835L
- **PDS1040** is 18% more efficient than Vishay SBLB1040
- **PDS1040CTL** is 49% more efficient than STM STPS10L40CG
- **PDS1040CTL** is 79% more efficient than ON MBRD835L
- **PDS1040CTL** is 50% more efficient than Vishay SBLB1040CT

\* Forward mode condition is  $I_F = 10$  Amperes  
Reverse mode condition is  $V_R = 35$  Volts

## Dimensional Highlights

- Low profile: Only 1.1mm tall, ideal for height limited applications. Compare with 2.3mm for SMC and DPAK, and 4.4mm for D<sup>2</sup>PAK.
- Small footprint: Occupies only 23.8mm<sup>2</sup> of PCB area, which can be compared with:
  - 47mm<sup>2</sup> for SMC (PowerDI™5 consumes 49% less area than SMC)
  - 61.5mm<sup>2</sup> for DPAK (PowerDI™5 consumes 55% less area than DPAK)
  - 181.4mm<sup>2</sup> for D<sup>2</sup>PAK (PowerDI™5 consumes 87% less area than D<sup>2</sup>PAK)

## Thermal Performance Benefits

- **Twice the Power Density of Competitive Package Types --**  
Highest power density package: 55mW/mm<sup>2</sup>, which can be compared with:
  - 25mW/mm<sup>2</sup> for SMC
  - 28 mW/mm<sup>2</sup> for DPAK
- **Up to 50% Lower Thermal Resistance than Competitive Package Types --**  
Thermally efficient package:  $R_{\theta JS} = 1.5 - 6.0^\circ\text{C/W}$ , which can be compared with:
  - 10 - 15°C/W for SMC
  - 2.4 - 6.0°C/W for DPAK
  - 2.0 - 4.0°C/W for D<sup>2</sup>PAK

PowerDI is a trademark of Diodes Incorporated.

## **Solderability & Environmental Highlights**

- RoHS Compliant
- “Green” (No Bromine, Antimony) Molding Compound
- Pb-Free, 100% Matte Tin Plating
- Withstands 260°C Solder Reflow
- Meets Moisture Sensitivity Level (MSL) 1

## **Applications**

- Voltage Regulation / Conversion
- Motor Drives
- Catch Diode for Buck Regulators
- Freewheeling Diode
- Reverse Polarity Protection

## **End Equipment Applications**

- Power Conversion
  - Notebook / Desktop SMPS
  - Adapters
  - DC / DC
- Servers / Networking
  - Synchronous Rectification / SMPS
- Industrial
  - Ballast
- Automotive
  - Broad-based Automotive Applications
  - HID Lighting
  - Engine Control Modules



**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                     | Symbol      | Min | Typ  | Max  | Unit          | Test Condition                               |
|------------------------------------|-------------|-----|------|------|---------------|--|
| Reverse Breakdown Voltage (Note 5) | $V_{(BR)R}$ | 100 | —    | —    | V             | $I_R = 0.2\text{mA}$                         |
| Forward Voltage                    | $V_F$       | —   | 0.71 | 0.75 | V             | $I_F = 3\text{A}, T_j = 25^\circ\text{C}$    |
|                                    |             | —   | 0.61 | 0.65 |               | $I_F = 3\text{A}, T_j = 100^\circ\text{C}$   |
|                                    |             | —   | 0.57 | 0.61 |               | $I_F = 3\text{A}, T_j = 125^\circ\text{C}$   |
|                                    |             | —   | 0.78 | 0.83 |               | $I_F = 6\text{A}, T_j = 25^\circ\text{C}$    |
|                                    |             | —   | 0.68 | 0.75 |               | $I_F = 6\text{A}, T_j = 100^\circ\text{C}$   |
|                                    |             | —   | 0.64 | 0.68 |               | $I_F = 6\text{A}, T_j = 125^\circ\text{C}$   |
| Reverse Current (Note 5)           | $I_R$       | —   | 2    | 200  | $\mu\text{A}$ | $T_j = 25^\circ\text{C}, V_R = 100\text{V}$  |
|                                    |             | —   | 4    | 5    | mA            | $T_j = 100^\circ\text{C}, V_R = 100\text{V}$ |
|                                    |             | —   | 2    | 20   | mA            | $T_j = 125^\circ\text{C}, V_R = 100\text{V}$ |

Notes: 5. Short duration test pulse used to minimize self-heating effect.

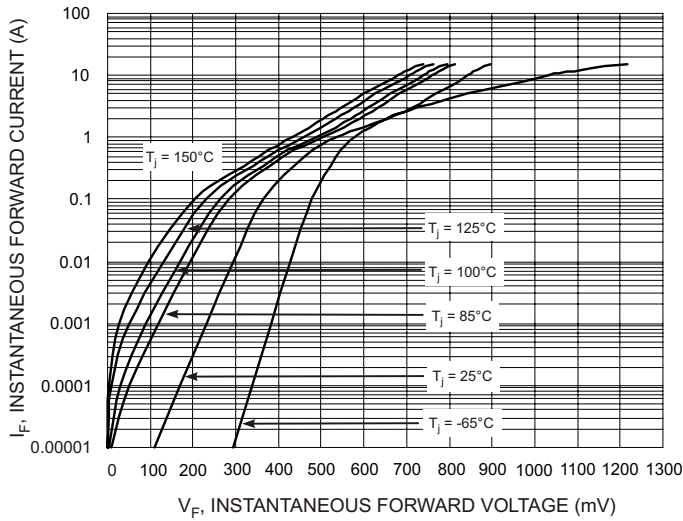


Fig. 1 Typical Forward Characteristics

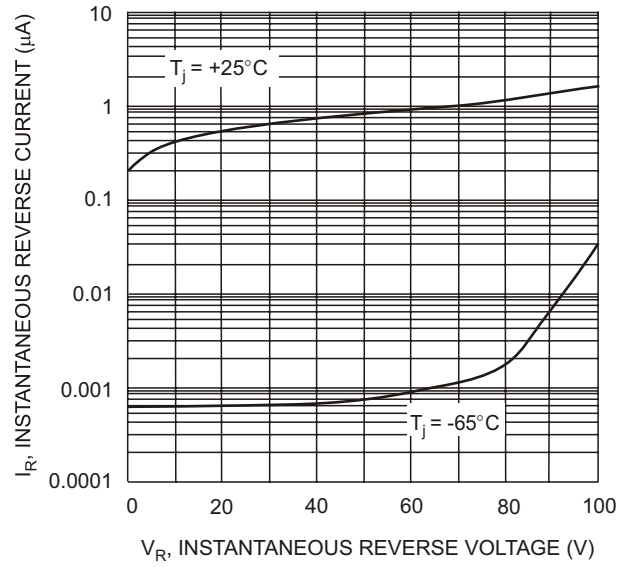


Fig. 2 Typical Reverse Characteristics

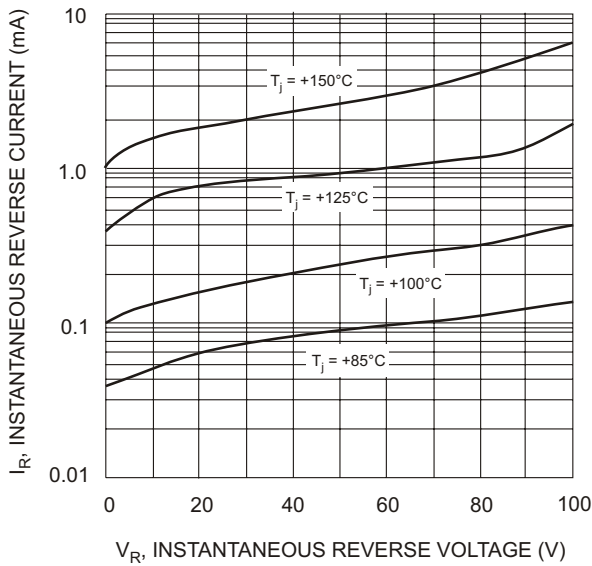


Fig. 3 Typical Reverse Characteristics

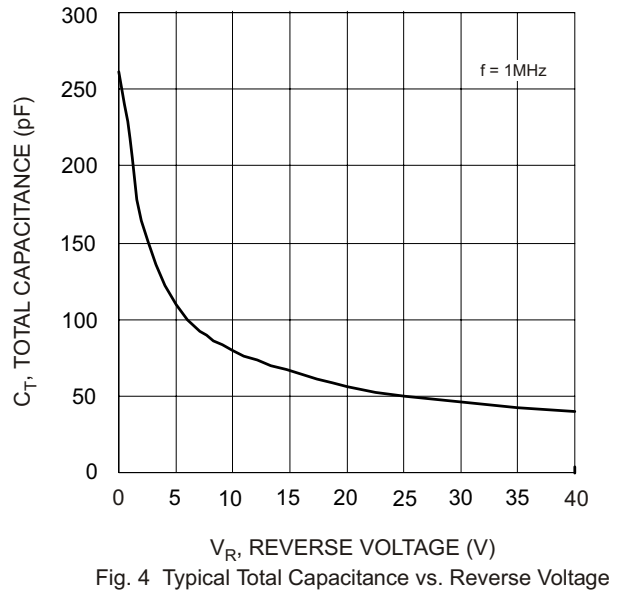


Fig. 4 Typical Total Capacitance vs. Reverse Voltage

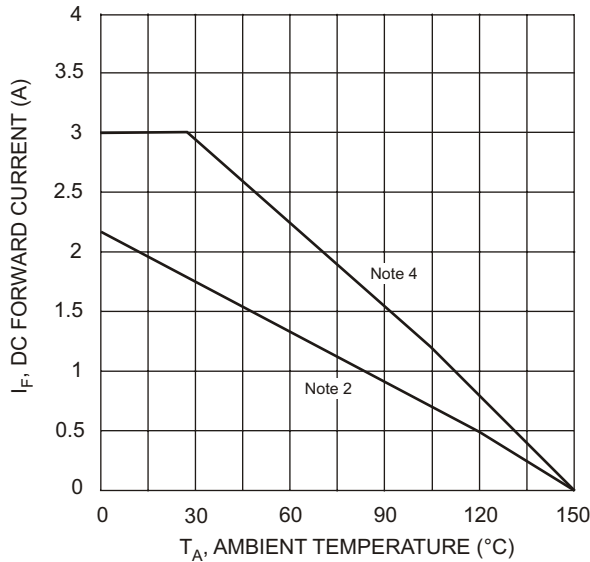


Fig. 5 DC Forward Current Derating

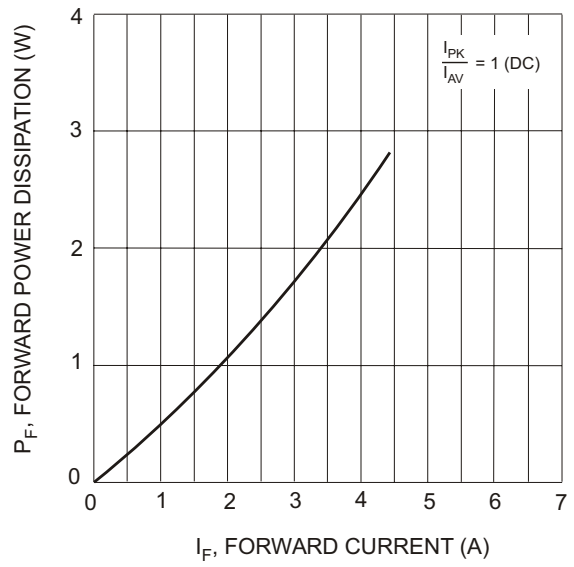


Fig. 6 Forward Power Dissipation

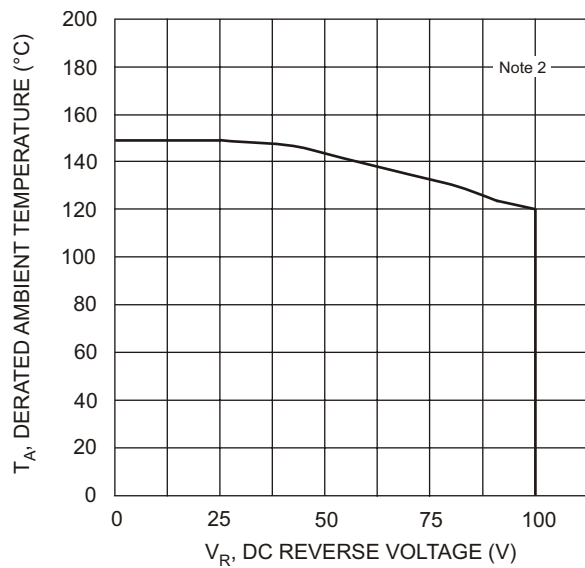


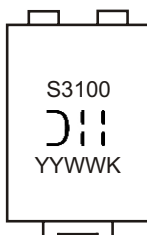
Fig. 7 Operating Temperature Derating

### Ordering Information (Note 6)

| Device     | Packaging | Shipping         |
|------------|-----------|------------------|
| PDS3100-13 | PowerDI™5 | 5000/Tape & Reel |

- Notes:
1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
  2. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  3. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  5. Short duration test pulse used to minimize self-heating effect.
  6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



S3100 = Product type marking code  
 Ⓜ = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last digit of year ex: 04 for 2004  
 WW = Week code 01 to 52  
 K = Factory Designator