

Product Summary (@ T_A = +25°C)

| V _{RRM} (V) | I _{FSM} (A) | V _{F(MAX)} (V) | I _{R(MAX)} (μA) |
|----------------------|----------------------|-------------------------|--------------------------|
| 120 | 12 | 0.80 | 500 |

Description and Applications

Packaged in the compact thermally efficient PowerDI[®]5 package, the SDT12A120P5 provides very low V_F and excellent reverse leakage stability at high temperatures. It is ideal for use as a rectifier, freewheel diode or blocking diode in:

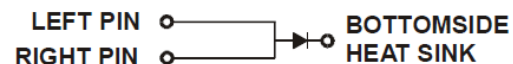
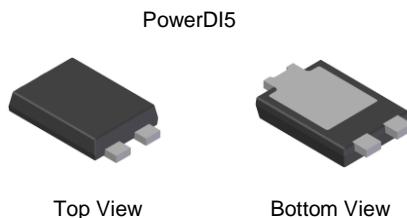
- DC/DC Converters
- AC/DC Adaptors

Features and Benefits

- Low Forward Voltage Drop
- Excellent High Temperature Stability
- Soft, Fast Switching Capability
- +150°C Operating Junction Temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([SDT12A120P5Q](#))**

Mechanical Data

- Case: PowerDI5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)

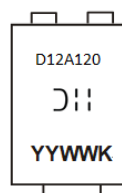


Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|--------------------------|----------|-------------------|
| SDT12A120P5-7 | PowerDI5 | 1,500/Tape & Reel |
| SDT12A120P5-7D (Note 5) | PowerDI5 | 1,500/Tape & Reel |
| SDT12A120P5-13 | PowerDI5 | 5,000/Tape & Reel |
| SDT12A120P5-13D (Note 5) | PowerDI5 | 5,000/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 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/>.
 5. PowerDI5 available in 5K quantity on 13-inch reel & 12mm tape, part number suffix "13D"; 1.5K quantity on 7-inch reel, part number suffix "7". Diodes Incorporated also provides 12mm tape with 7-inch reel, part number suffix "7D".

Marking Information


)!! = Manufacturer's Marking
 D12A120 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 17 = 2017)
 WW = Week (01 to 53)
 K = Factory Designator

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} | 120 | V |
| Average Rectified Output Current | I _O | 12 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms | I _{FSM} | 300 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 6) | R _{θJA} | 88 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 7) | R _{θJA} | 18 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--------------------------|----------------|-----|------|------|------|--|
| Forward Voltage Drop | V _F | — | 0.57 | — | V | I _F = 6A, T _J = +25°C |
| | | — | 0.72 | 0.80 | | I _F = 12A, T _J = +25°C |
| | | — | 0.51 | — | | I _F = 6A, T _J = +125°C |
| | | — | 0.63 | 0.70 | | I _F = 12A, T _J = +125°C |
| Leakage Current (Note 8) | I _R | — | — | 0.5 | mA | V _R = 120V, T _J = +25°C |
| | | — | 5 | 35 | | V _R = 120V, T _J = +125°C |

- Notes:
6. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
 7. Aluminum 2inch*2inch substrate PCB with 50mm x 50mm x 23mm Al heat sink.
 8. Short duration pulse test used to minimize self-heating effect.

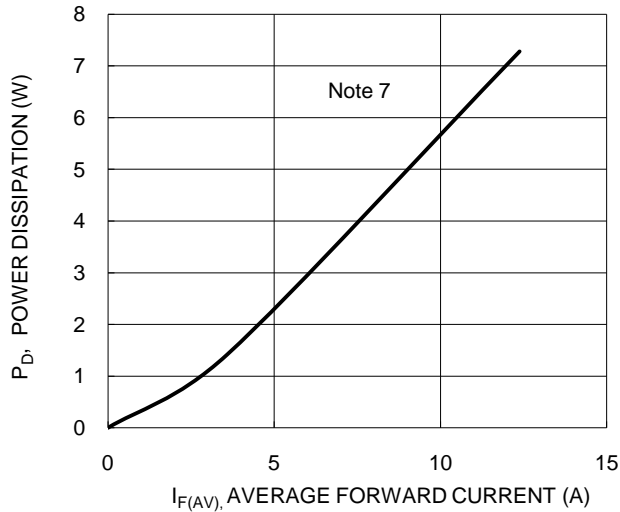


Figure 1. Forward Power Dissipation

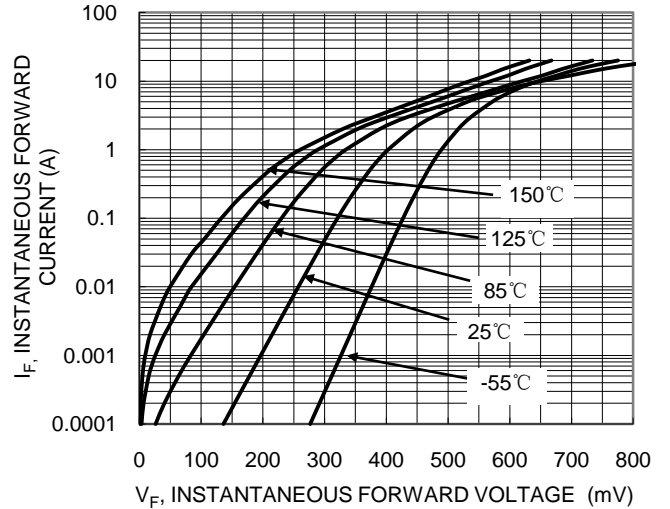


Figure 2. Typical Forward Characteristics

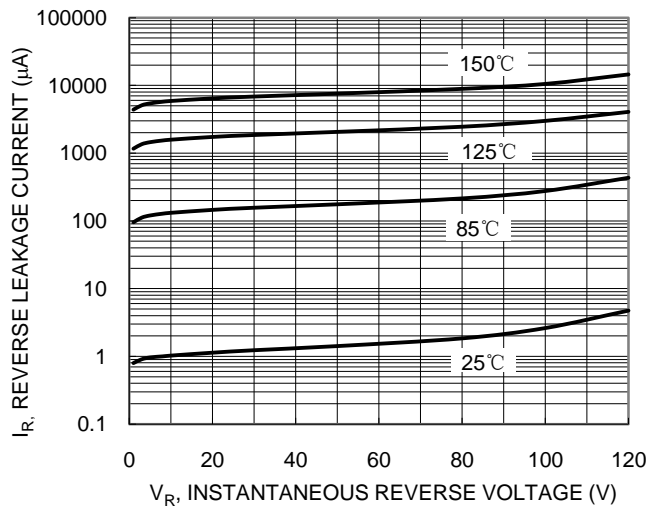


Figure 3. Typical Reverse Characteristics

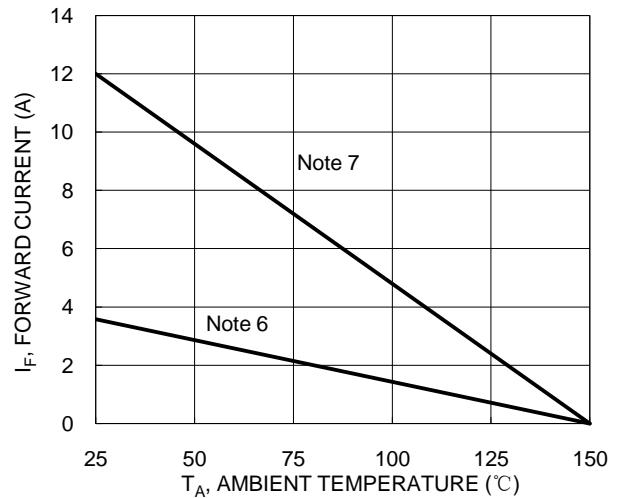


Figure 4. Forward Current Derating Curve

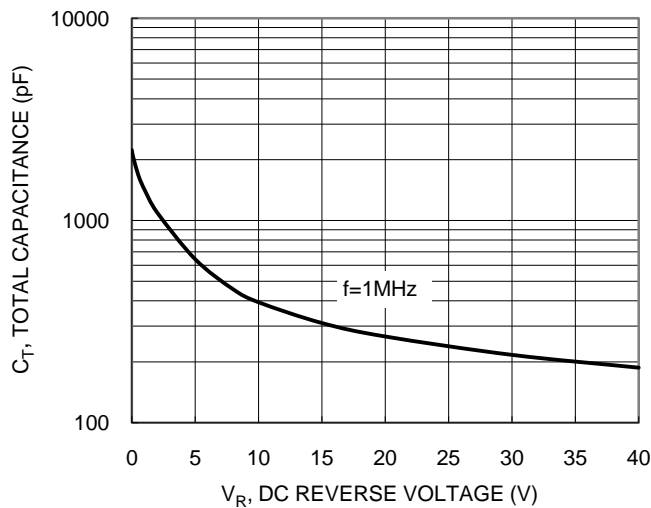
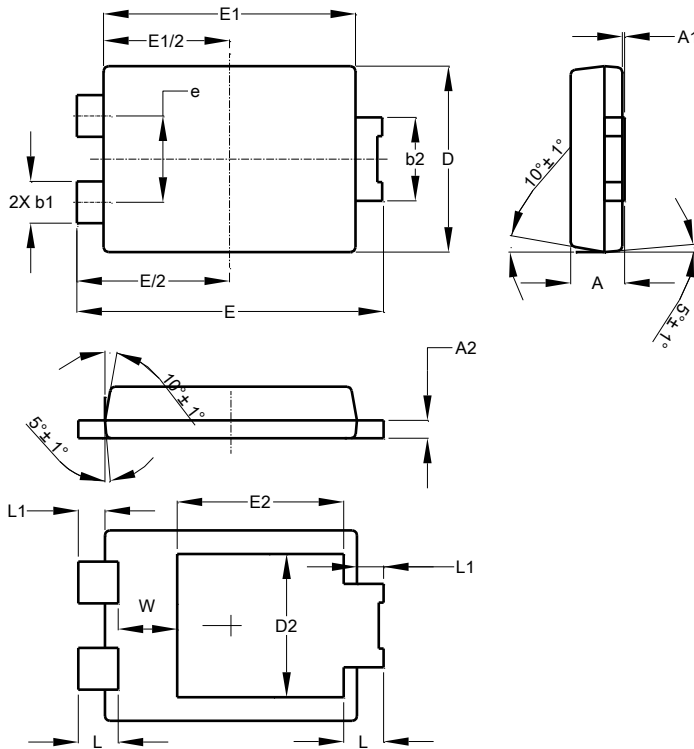


Figure 5. Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

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

PowerDI5

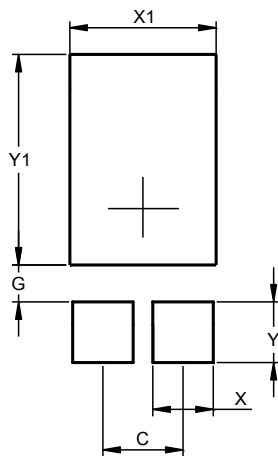


| PowerDI5 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 6.60 | 6.504 |
| e | -- | -- | 1.84 |
| E1 | 5.30 | 5.45 | 5.37 |
| E2 | -- | -- | 3.549 |
| L | 0.75 | 0.95 | 0.85 |
| L1 | 0.50 | 0.65 | 0.57 |
| W | 1.10 | 1.41 | 1.255 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

PowerDI5



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.840 |
| G | 0.852 |
| X | 1.390 |
| X1 | 3.360 |
| Y | 1.400 |
| Y1 | 4.860 |

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