

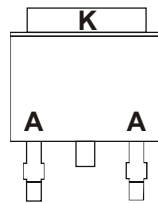
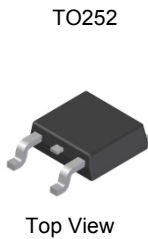
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### Features

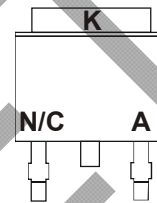
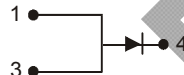
- DIODESTAR™ is a Proprietary Process for High Voltage Rectifiers which Delivers:
  - Ultra-Fast Reverse Recovery ( $t_{rr} < 30\text{ns}$ ) Giving a Rapid Switching Response
  - Soft Recovery for Low EMI Noise
  - Excellent High Temperature Stability
  - High Forward Surge Capability
- Enables High Efficiency as the Boost Diode in PFC Circuits
- **Lead Free Finish, RoHS Compliant (Note 1)**

### Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 <sup>(E3)</sup>
- Weight: 0.4 grams (approximate)



Package Pin-Out Configuration  
DSR6U600D1



Package Pin-Out Configuration  
DSR6U600D1S

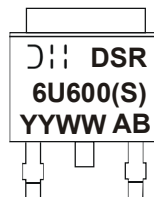


### Ordering Information (Note 2)

| Part Number    | Case  | Packaging        |
|----------------|-------|------------------|
| DSR6U600D1-13  | TO252 | 2500 pieces/reel |
| DSR6U600D1S-13 | TO252 | 2500 pieces/reel |

Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2). All applicable RoHS exemptions applied.  
2. For packaging details, go to our website at <http://www.diodes.com>.

### Marking Information



DSR6U600(S) = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last two digits of year (ex: 08 = 2008)  
 WW = Week (01 - 53)

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  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   | $V_{RRM}$ | 600   | V    |
| Working Peak Reverse Voltage  | $V_{RWM}$ |       |      |
| DC Blocking Voltage   | $V_{RM}$  |       |      |
| Average Rectified Output Current  | $I_O$     | 6     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 60    | A    |
| Repetitive Peak Avalanche Power (1 $\mu\text{s}$ , 25 $^\circ\text{C}$ )                            | $P_{ARM}$ | 4,000 | W    |

**Thermal Characteristics**

| Characteristic                                    | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Maximum Thermal Resistance                        |                 |             |                    |
| Thermal Resistance Junction to Soldering (Note 3) | $R_{\theta JS}$ | 10          | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient (Note 3)   | $R_{\theta JA}$ | 47          |                    |
| Operating and Storage Temperature Range           | $T_J, T_{STG}$  | -65 to +175 | $^\circ\text{C}$   |

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

| Characteristic           | Symbol   | Min | Typ | Max | Unit          | Test Condition  |
|--------------------------|----------|-----|-----|-----|---------------|---|
| Forward Voltage Drop     | $V_F$    | -   | 2.1 | 2.6 | V             | $I_F = 6\text{A}, T_J = 25^\circ\text{C}$   |
| Leakage Current (Note 4) | $I_R$    | -   | -   | 50  | $\mu\text{A}$ | $V_R = 600\text{V}, T_J = 25^\circ\text{C}$   |
| Reverse Recovery Time    | $t_{rr}$ | -   | 21  | 25  | ns            | $I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A}$<br>$I_F = 1\text{A}, V_R = 30\text{V},$<br>$di/dt = 50\text{A}/\mu\text{s}$ |
|                          |          | -   | 33  | 45  |               |   |
| Softness Factor          | S        | -   | 0.5 | -   | -             |   |
| Reverse Recovery Current | $I_{RM}$ | -   | 4.3 | -   | A             | $I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s},$<br>$V_R = 400\text{V}, T_J = 125^\circ\text{C}$                                     |
| Reverse Recovery Charges | $Q_{rr}$ | -   | 220 | -   | nC            |   |
| Junction Capacitance     | $C_J$    | -   | 30  | -   | pF            | $V_R = 4.0\text{V}, f = 1\text{MHz}$  |

Notes: 3. Device mounted on Polyimide substrate, 1" x 1", 2oz, copper, double-sided, PC boards.  
4. Short duration pulse test used to minimize self-heating effect.

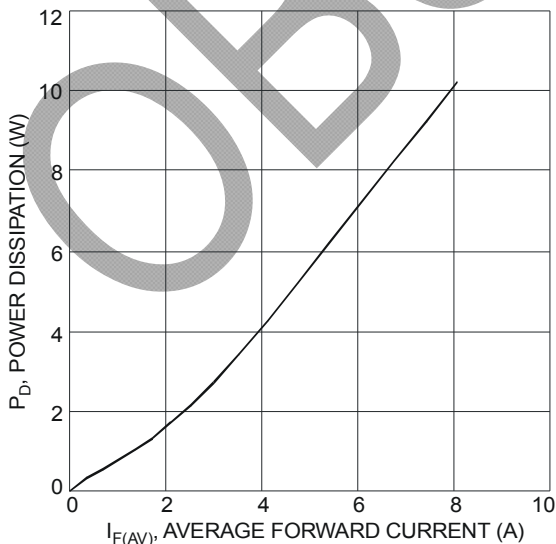


Fig. 1 Forward Power Dissipation

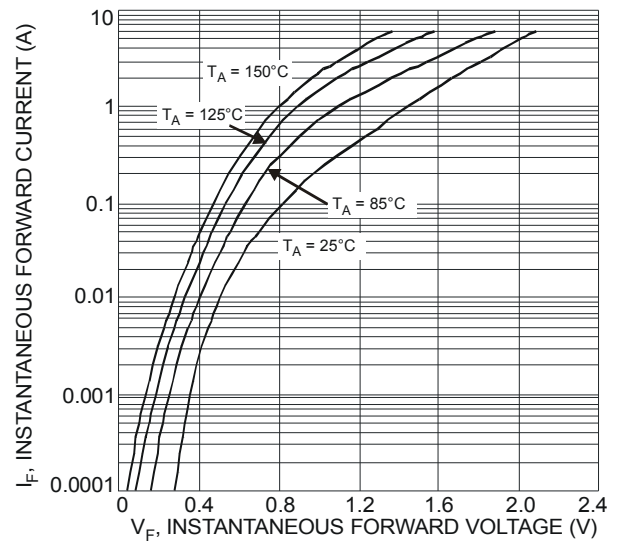


Fig.2 Typical Forward Characteristics

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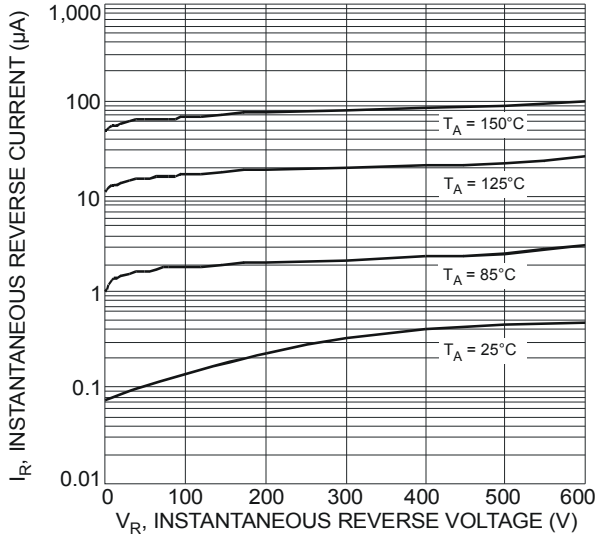


Fig. 3 Typical Reverse Characteristics

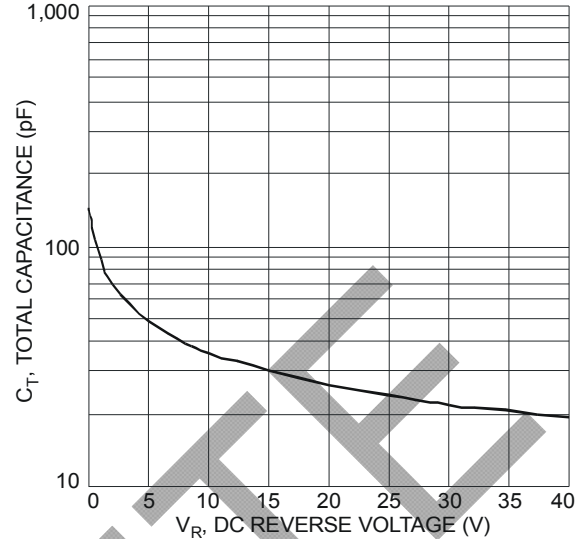


Fig. 4 Total Capacitance vs. Reverse Voltage

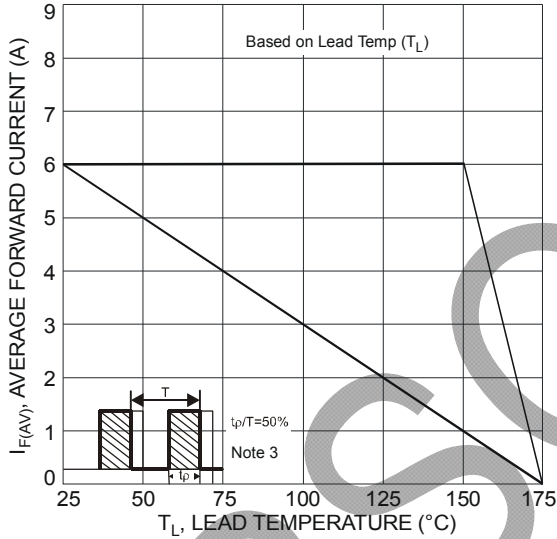


Fig. 5 Forward Current Derating Curve

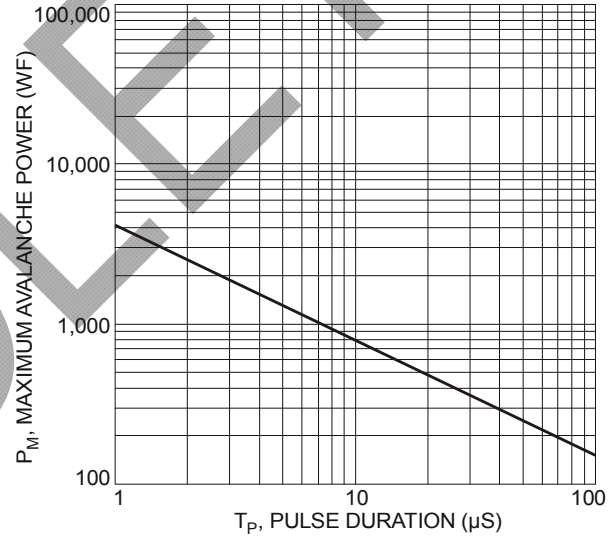


Fig. 6 Maximum Avalanche Power

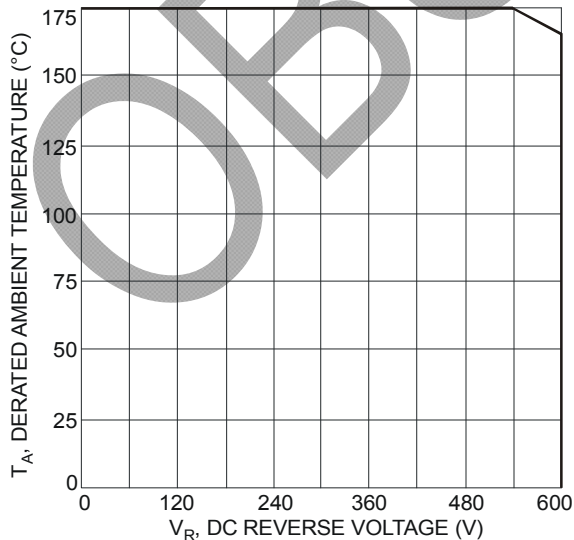
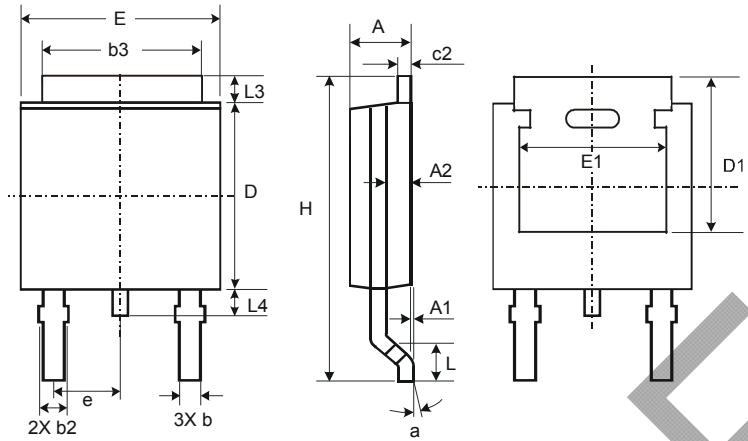


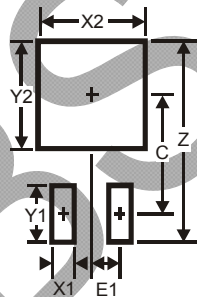
Fig. 7 Operating Temperature Derating

**Package Outline Dimensions**



| TO252                |      |       |       |
|----------------------|------|-------|-------|
| Dim                  | Min  | Max   | Typ   |
| A                    | 2.19 | 2.39  | 2.29  |
| A1                   | 0.00 | 0.13  | 0.08  |
| A2                   | 0.97 | 1.17  | 1.07  |
| b                    | 0.64 | 0.88  | 0.783 |
| b2                   | 0.76 | 1.14  | 0.95  |
| b3                   | 5.21 | 5.46  | 5.33  |
| c2                   | 0.45 | 0.58  | 0.531 |
| D                    | 6.00 | 6.20  | 6.10  |
| D1                   | 5.21 | -     | -     |
| e                    | -    | -     | 2.286 |
| E                    | 6.45 | 6.70  | 6.58  |
| E1                   | 4.32 | -     | -     |
| H                    | 9.40 | 10.41 | 9.91  |
| L                    | 1.40 | 1.78  | 1.59  |
| L3                   | 0.88 | 1.27  | 1.08  |
| L4                   | 0.64 | 1.02  | 0.83  |
| a                    | 0°   | 10°   | -     |
| All Dimensions in mm |      |       |       |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 11.6          |
| X1         | 1.5           |
| X2         | 7.0           |
| Y1         | 2.5           |
| Y2         | 7.0           |
| C          | 6.9           |
| E1         | 2.3           |

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