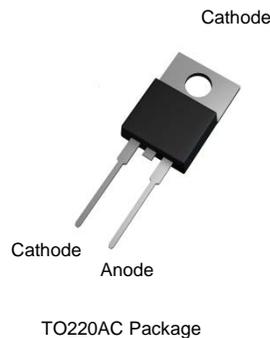


## Product Summary

| $V_{RRM}$ (V) | $I_o$ (A) | $V_F$ typ (V)<br>@ +25°C | $t_{rr}$ typ (nS)<br>@ +25°C | $I_{RM}$ typ (A)<br>@ +25°C |
|---------------|-----------|--------------------------|------------------------------|-----------------------------|
| 600           | 8         | 2.3                      | 20                           | 6.9                         |

## Description and Application

The DIODESTAR™ DSR8A600 is designed specifically for use as a boost diode in Power Factor Correction (PFC) applications. Its soft fast switching characteristics make it ideal for use in hard switching and Continuous Conduction Mode (CCM) PFC circuits.

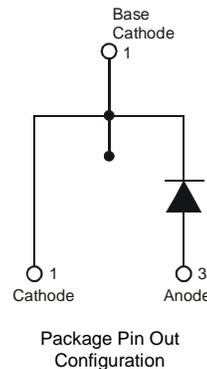


## Features and Benefits

- Low  $V_F$  minimises Boost Diode conduction losses
- Very fast  $t_{rr}$  reduces MOSFET PFC switching losses
- Soft switching ensures ringing and EMI are reduced
- Low  $Q_{rr}$  and  $I_{RM}$  minimize boost diode recovery losses
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: TO220AC
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 ③
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 1.75 grams (approximate)

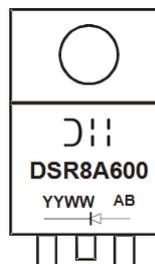


## Ordering Information (Note 4)

| Part Number | Case    | Packaging      |
|-------------|---------|----------------|
| DSR8A600    | TO220AC | 50 pieces/tube |

- 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DSR8A600 = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last two digits of year (ex: 14 = 2014)  
 WW = Week (01 - 53)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.

| 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 $T \leq +101^\circ\text{C}$  | $I_O$     | 8     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 65    | A    |
| Non-Repetitive Peak Forward Surge Current 10ms<br>Single Half Sine-Wave Superimposed on Rated Load  | $I_{FSM}$ | 60    | A    |

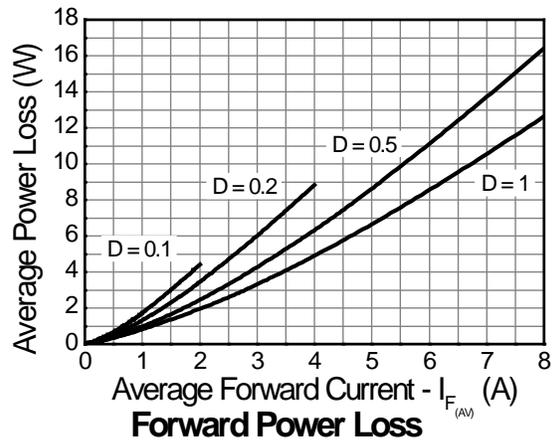
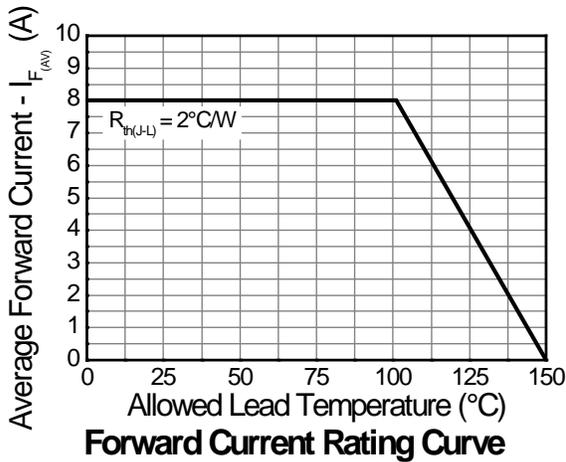
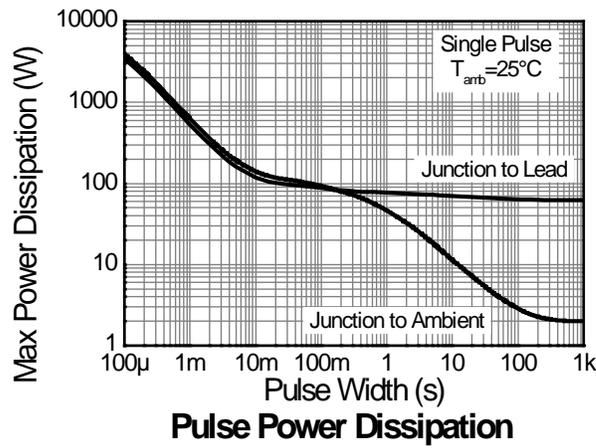
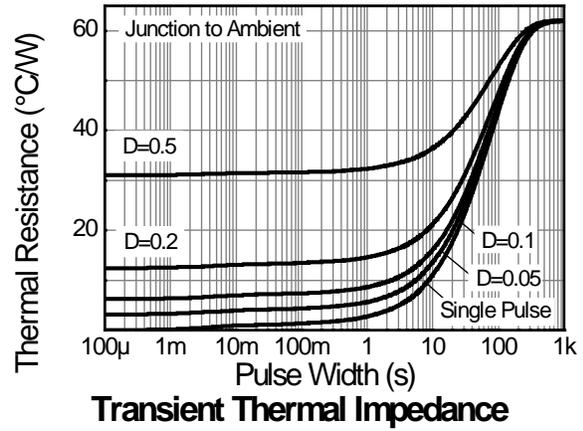
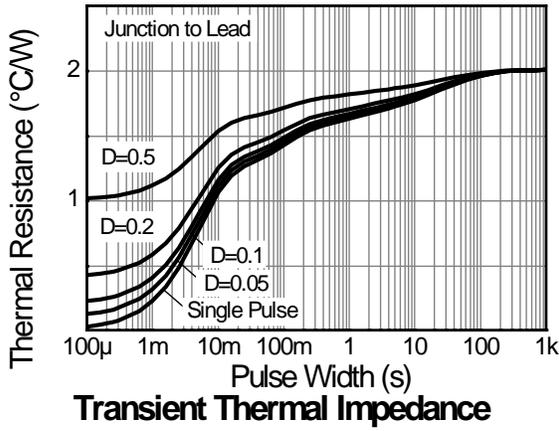
**Thermal Characteristics**

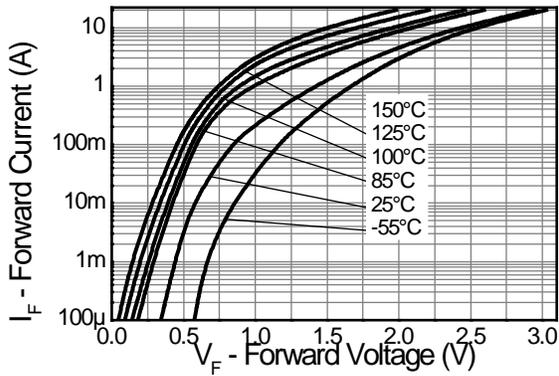
| Characteristic   | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Typical Thermal Resistance, Junction to Lead (Note 4)    | $R_{\theta JL}$ | 2           | $^\circ\text{C/W}$ |
| Typical Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 62          | $^\circ\text{C/W}$ |
| Storage Temperature Range                                | $T_{STG}$       | -55 to +150 | $^\circ\text{C}$   |
| Maximum Operating Junction Temperature                   | $T_J$           | +150        | $^\circ\text{C}$   |

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

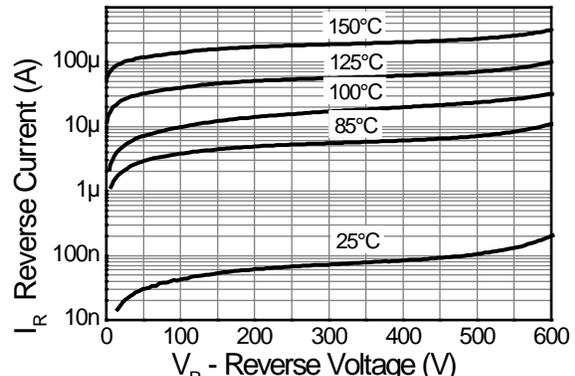
| Characteristic           | Symbol   | Min | Typ | Max | Unit          | Test Condition  |
|--------------------------|----------|-----|-----|-----|---------------|---|
|                          |          |     |     |     |               |   |
| Forward Voltage Drop     | $V_F$    | —   | 2.3 | 3.2 | V             | $I_F = 8\text{A}, T_J = +25^\circ\text{C}$  |
|                          |          | —   | 1.6 | —   |               | $I_F = 8\text{A}, T_J = +125^\circ\text{C}$   |
| Leakage Current (Note 6) | $I_R$    | —   | <1  | 20  | $\mu\text{A}$ | $V_R = 600\text{V}, T_J = +25^\circ\text{C}$  |
|                          |          | —   | 100 | —   |               | $V_R = 600\text{V}, T_J = +125^\circ\text{C}$   |
| Reverse Recovery Time    | $t_{rr}$ | —   | 25  | 30  | ns            | $I_F = 1\text{A}, I_R = 0.5\text{A}, I_{RR} = 0.25\text{A}, R_{G1}$                             |
| Reverse Recovery Time    | $t_{rr}$ | —   | 20  | —   | ns            | $I_F = 8\text{A}, dI/dt = 500\text{A}/\mu\text{s}, V_R = 390\text{V}, T_J = +25^\circ\text{C}$  |
| Reverse Recovery Current | $I_{RM}$ | —   | 6.9 | —   | A             |   |
| Reverse Recovery Charges | $Q_{rr}$ | —   | 85  | —   | nC            | $I_F = 8\text{A}, dI/dt = 500\text{A}/\mu\text{s}, V_R = 390\text{V}, T_J = +125^\circ\text{C}$ |
| Reverse Recovery Time    | $t_{rr}$ | —   | 37  | —   | ns            |   |
| Reverse Recovery Current | $I_{RM}$ | —   | 8.3 | —   | A             | $I_F = 8\text{A}, dI/dt = 500\text{A}/\mu\text{s}, V_R = 390\text{V}, T_J = +125^\circ\text{C}$ |
| Reverse Recovery Charges | $Q_{rr}$ | —   | 161 | —   | nC            |   |
| Junction Capacitance     | $C_J$    | —   | 7.7 | —   | pF            | 100.0V, 1MHz  |

- Notes:
4. Measured from Cathode Tab.
  5. Device free standing with no Heat sink.
  6. Short duration pulse test used to minimize self-heating effect.

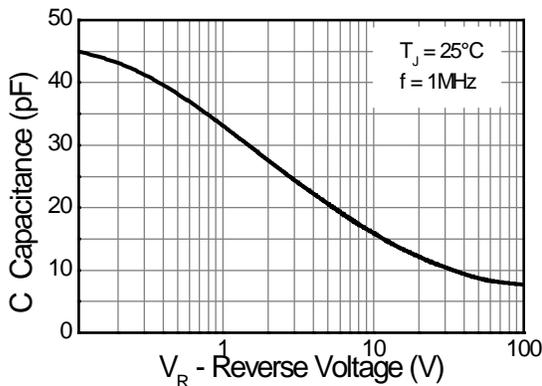




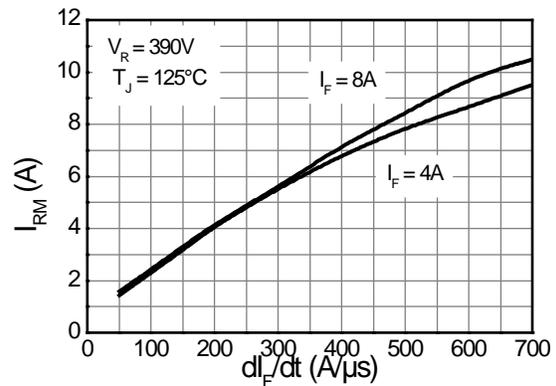
**Instantaneous Forward Voltage (V)**



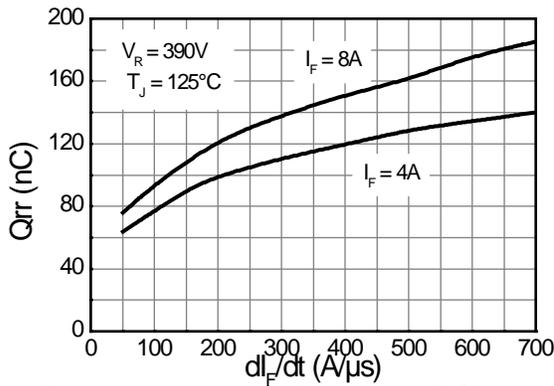
**Reverse Leakage Current**



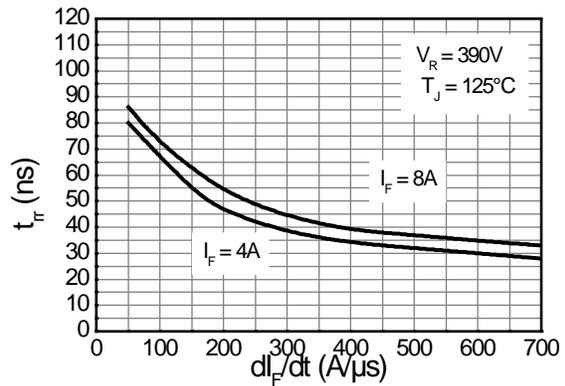
**Capacitance vs Reverse Voltage**



**Peak reverse current vs  $di_F/dt$**

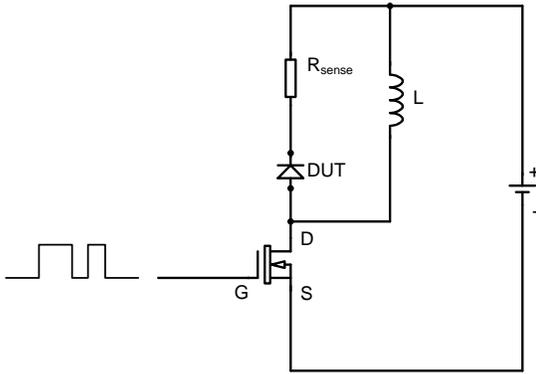


**Reverse recovery charge vs  $di_F/dt$**

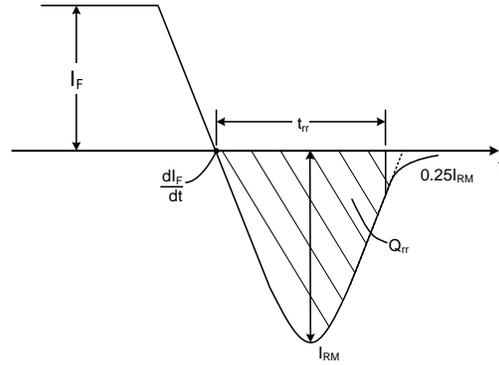


**Reverse Recovery Time vs  $di_F/dt$**

**Test Circuit and Waveform definitions**



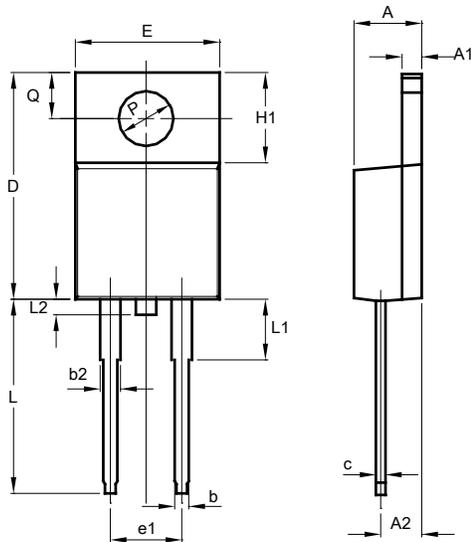
**t<sub>rr</sub> Test Circuit**



**t<sub>rr</sub> Waveform and definitions**

**Package Outline Dimensions**

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



| TO220AC              |       |     |       |
|----------------------|-------|-----|-------|
| Dim                  | Min   | Typ | Max   |
| A                    | 4.40  | -   | 4.82  |
| A1                   | 1.1   | -   | 1.40  |
| A2                   | 2.05  | -   | 2.92  |
| b                    | 0.72  | -   | 1.00  |
| b2                   | 1.16  | -   | 1.45  |
| c                    | 0.36  | -   | 0.68  |
| D                    | 14.70 | -   | 15.87 |
| e1                   | 5.08  |     |       |
| E                    | 9.80  | -   | 10.26 |
| H1                   | 5.80  | -   | 6.40  |
| L                    | 12.70 | -   | 13.96 |
| L1                   | 3.56  | -   | 4.50  |
| P                    | 3.70  | -   | 3.90  |
| Q                    | 2.54  | -   | 3.30  |
| All Dimensions in mm |       |     |       |

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