



5A SURFACE MOUNT ULTRA-FAST RECOVERY RECTIFIER

Product Summary (@TA = +25°C)

| V _{RRM} (V) | I _O (A) | V _F (V) | I _R (μA) |
|----------------------|--------------------|--------------------|---------------------|
| 600 | 5 | 3.0 | 30 |

Features and Benefits

- Soft, Ultra-Fast Switching Capability for High Efficiency
- Low Leakage Current
- High Current Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Description and Applications

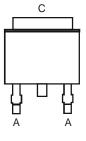
This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power DCM and CCM PFC applications. It is especially suited for use in SMPS, home appliances, office equipment, and telecommunication applications.

Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound;
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (2)
- Polarity: See Diagram

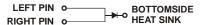


Top View



TO252 (DPAK)

Top View Pin-Out



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

Ordering Information (Note 4)

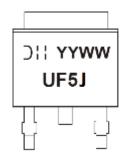
| Part Number | Case | Packaging |
|-------------|--------------|-------------------|
| UF5JD1-13 | TO252 (DPAK) | 2,500 Pieces/Reel |

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 http://www.diodes.com/products/packages.html.

Marking Information





UF5J = Product Type Marking Code

☐ = Manufacturers' Code Marking

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 17 for 2017)

WW = Week Code (01 - 53)



Maximum Ratings (@T_A = +25°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 Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} V _{RWM} V _R | 600 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 420 | V |
| Average Rectified Output Current | lo | 5 | Α |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I _{FSM} | 80 | А |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Case (Note 5) | $R_{	heta JC}$ | 18 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 5) | R _{0JA} | 80 | °C/W |
| Typical Thermal Resistance Junction to Case (Note 6) | $R_{	heta JC}$ | 2 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 6) | R _{0JA} | 18 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

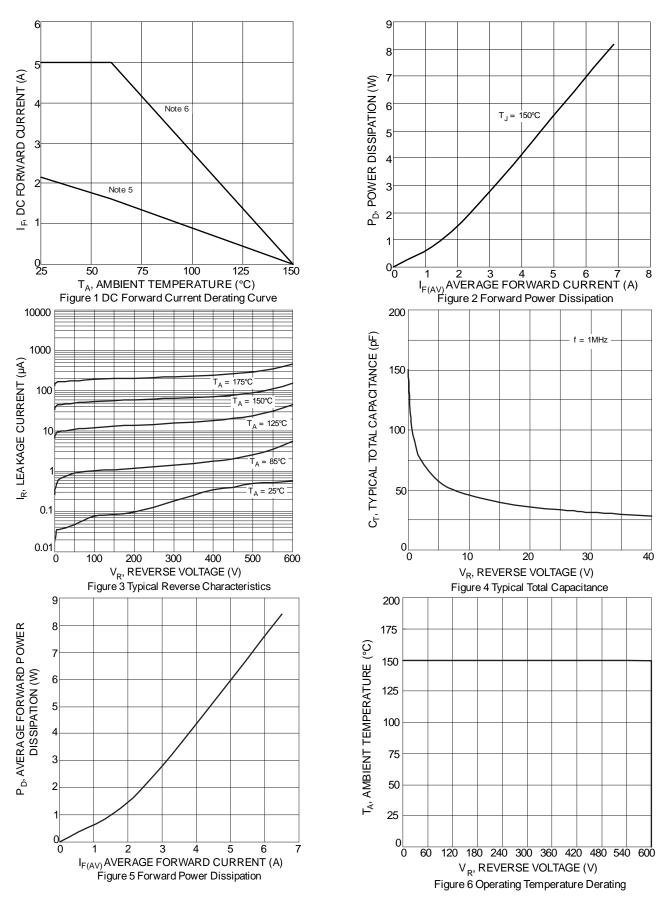
Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Тур | Max | Unit | Test Condition |
|------------------------------------|-----------------|-----|------|-----|------|---|
| Reverse Breakdown Voltage (Note 7) | $V_{(BR)R}$ | 600 | | | > | $I_R = 30\mu A$ |
| | | | 1.1 | 1.6 | | I _F = 1A, T _J = +25°C |
| | | _ | 0.7 | _ | | $I_F = 1A, T_J = +125$ °C |
| Forward Voltage | VF | _ | 1.5 | 2.3 | V | I _F = 3A, T _J = +25°C |
| orward vollage | ٧F | _ | 1.0 | _ | ľ | $I_F = 3A, T_J = +125^{\circ}C$ |
| | | _ | 1.8 | 3.0 | | I _F = 5A, T _J = +25°C |
| | | _ | 1.2 | _ | | I _F = 5A, T _J = +125°C |
| Reverse Leakage Current (Note 7) | - | _ | 0.57 | 30 | μΑ | $V_R = 600V, T_J = +25^{\circ}C$ |
| Neverse Leakage Current (Note 1) | IR | _ | 0.04 | 5 | mA | $V_R = 600V, T_J = +125$ °C |
| Payoroo Pagayory Tima | 4 | | 15 | 25 | l ns | $I_F = 0.5A$, $I_R = 1.0A$, $I_{rr} = 0.25A$ |
| Reverse Recovery Time | t _{RR} | _ | 12 | 22 | | $I_F = 1A$, $V_R = 30V$, $di/dt = 100A/\mu s$ |
| Reverse Recovery Charge | Q_{RR} | _ | 5 | _ | nC | $I_F = 1A$, $V_R = 30V$, $di/dt = 100A/\mu s$ |
| Total Capacitance | Ст | _ | 45 | 50 | pf | $V_R = 10V_{DC}$, $f = 1MHz$ |

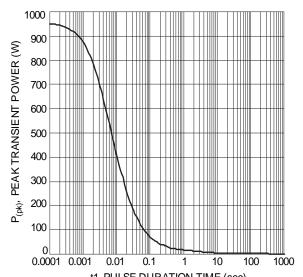
Notes:

- Device mounted on FR4 PCB with 1x recommended pad layout.
 Device mounted on 2-inch Al substrate PCB.
- 7. Short duration pulse test used to minimize self-heating effect.

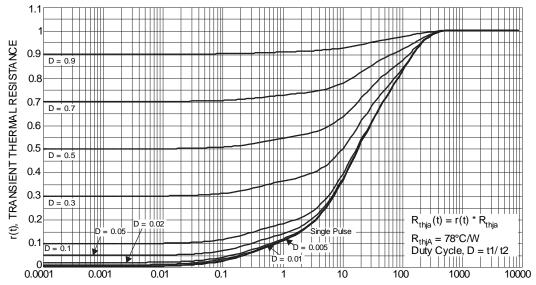








t1, PULSE DURATION TIME (sec) Figure 7 Single Pulse Maximum Power Dissipation

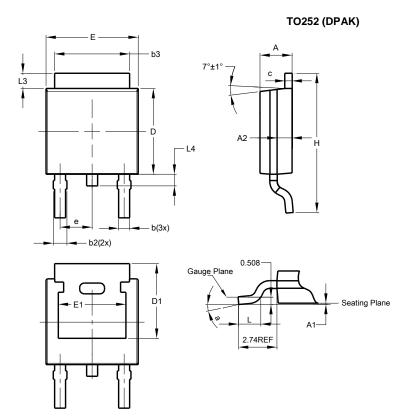


t1, PULSE DURATION TIME (sec) Figure 8 Transient Thermal Resistance



Package Outline Dimensions

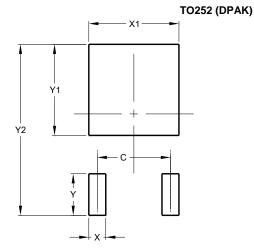
Please see http://www.diodes.com/package-outlines.html for the latest version.



| TO252 (DPAK) | | | | | |
|----------------------|------|-------|-------|--|--|
| Dim | Min | Max | Тур | | |
| Α | 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 | | |
| С | 0.45 | 0.58 | 0.531 | | |
| D | 6.00 | 6.20 | 6.10 | | |
| D1 | 5.21 | - | - | | |
| е | - | - | 2.286 | | |
| Е | 6.45 | 6.70 | 6.58 | | |
| E1 | 4.32 | - | - | | |
| Н | 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 | | |
| а | 0° | 10° | - | | |
| All Dimensions in mm | | | | | |

Suggested Pad Layout

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



| Dimensions | Value (in mm) | | |
|------------|---------------|--|--|
| С | 4.572 | | |
| Х | 1.060 | | |
| X1 | 5.632 | | |
| Y | 2.600 | | |
| Y1 | 5.700 | | |
| V2 | 10.700 | | |



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