



**THE DATASHEET OF  
UF5JD1-13**



## 5A SURFACE MOUNT ULTRA-FAST RECOVERY RECTIFIER

### Product Summary (@ T<sub>A</sub> = +25°C)

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> (V)	I <sub>R</sub> (μA)
600	5	3.0	30

### Description and Applications

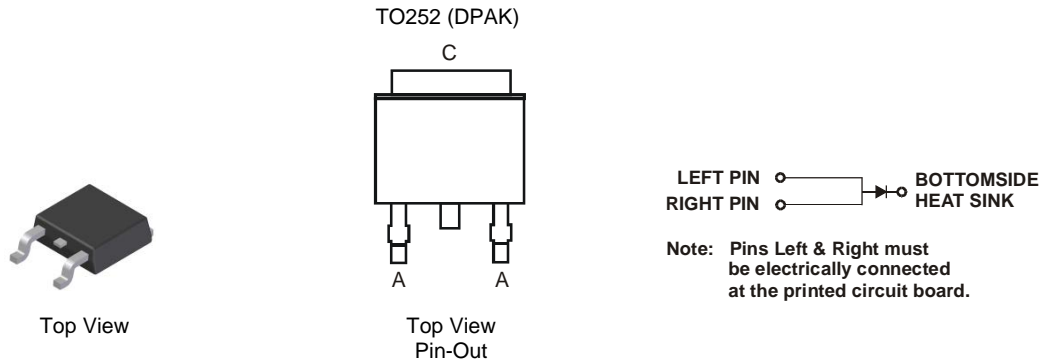
This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power DCM and CCM PFC applications. It is especially suited for use in SMPS, home appliances, office equipment, and telecommunication applications.

### 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)**

### 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 Lead-Frame. Solderable per MIL-STD-202, Method 208 <sup>(3)</sup>
- Polarity: See Diagram



### 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) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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/>.

### Marking Information



UF5J = Product Type Marking Code  
 DII = Manufacturers' Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 17 for 2017)  
 WW = Week Code (01 - 53)

**Maximum Ratings** (@  $T_A = +25^\circ\text{C}$ , 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	$V_R$		
RMS Reverse Voltage	$V_{R(RMS)}$	420	V
Average Rectified Output Current	$I_O$	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	$I_{FSM}$	80	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Case (Note 5)	$R_{\theta JC}$	18	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	80	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Case (Note 6)	$R_{\theta JC}$	2	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	18	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	$V_{(BR)R}$	600	—	—	V	$I_R = 30\mu\text{A}$
Forward Voltage	$V_F$	—	1.1	1.6	V	$I_F = 1\text{A}, T_J = +25^\circ\text{C}$
		—	0.7	—		$I_F = 1\text{A}, T_J = +125^\circ\text{C}$
		—	1.5	2.3		$I_F = 3\text{A}, T_J = +25^\circ\text{C}$
		—	1.0	—		$I_F = 3\text{A}, T_J = +125^\circ\text{C}$
		—	1.8	3.0		$I_F = 5\text{A}, T_J = +25^\circ\text{C}$
—	1.2	—	$I_F = 5\text{A}, T_J = +125^\circ\text{C}$			
Reverse Leakage Current (Note 7)	$I_R$	—	0.57	30	$\mu\text{A}$	$V_R = 600\text{V}, T_J = +25^\circ\text{C}$
		—	0.04	5	$\text{mA}$	$V_R = 600\text{V}, T_J = +125^\circ\text{C}$
Reverse Recovery Time	$t_{RR}$	—	15	25	ns	$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$
		—	12	22		$I_F = 1\text{A}, V_R = 30\text{V}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	5	—	nC	$I_F = 1\text{A}, V_R = 30\text{V}, di/dt = 100\text{A}/\mu\text{s}$
Total Capacitance	$C_T$	—	45	50	pf	$V_R = 10\text{V}_{DC}, f = 1\text{MHz}$

Notes: 5. Device mounted on FR4 PCB with 1x recommended pad layout.  
6. Device mounted on 2-inch Al substrate PCB.  
7. Short duration pulse test used to minimize self-heating effect.

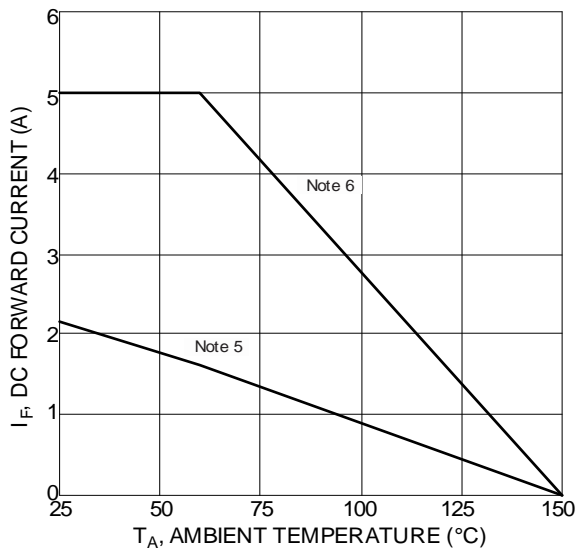


Figure 1 DC Forward Current Derating Curve

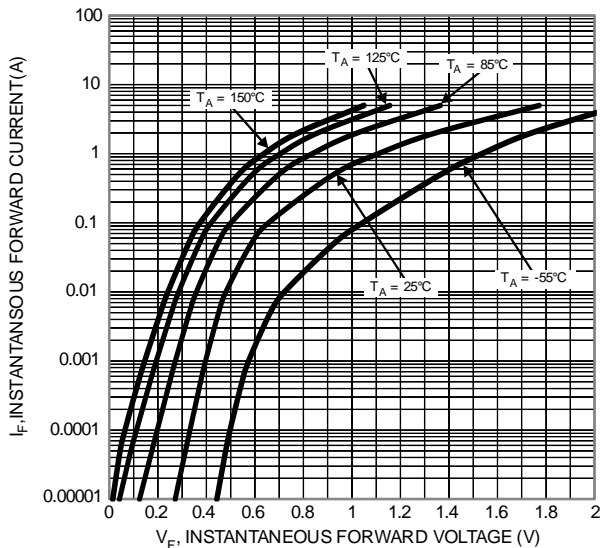


Figure 2 Typical Forward Characteristics

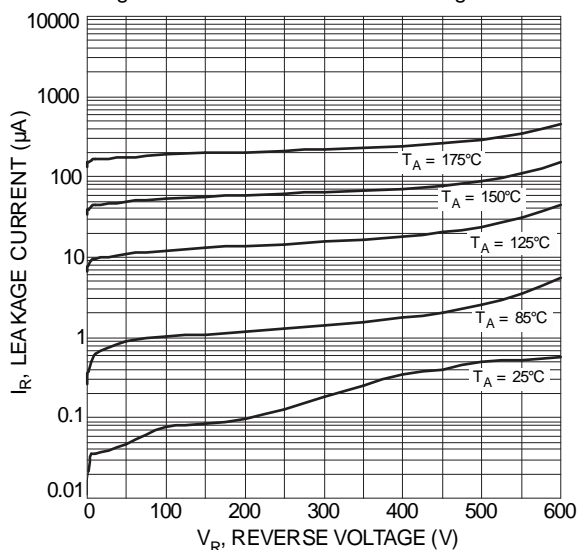


Figure 3 Typical Reverse Characteristics

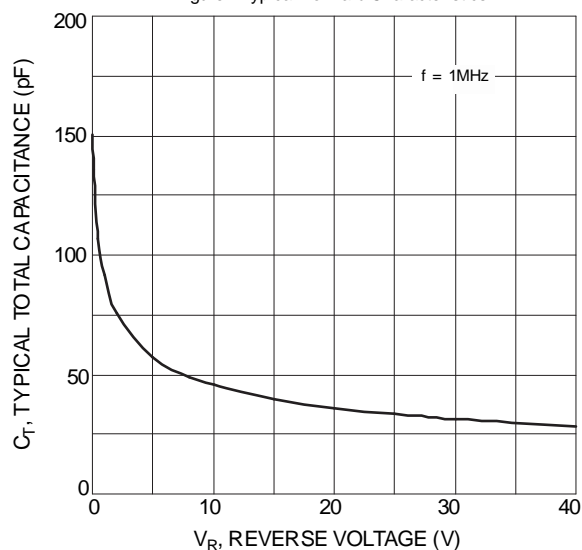


Figure 4 Typical Total Capacitance

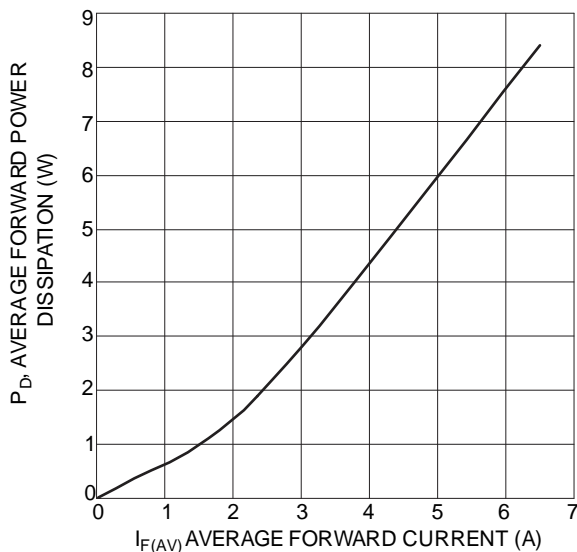


Figure 5 Forward Power Dissipation

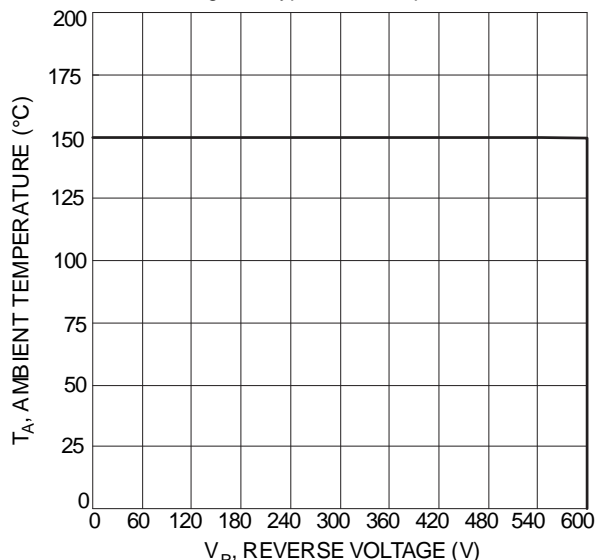


Figure 6 Operating Temperature Derating

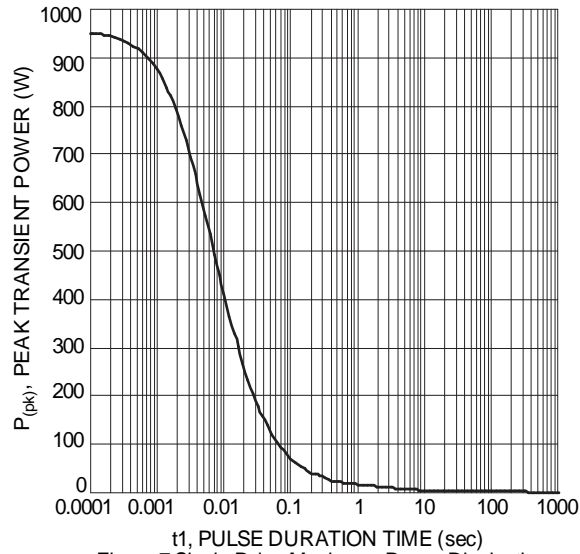


Figure 7 Single Pulse Maximum Power Dissipation

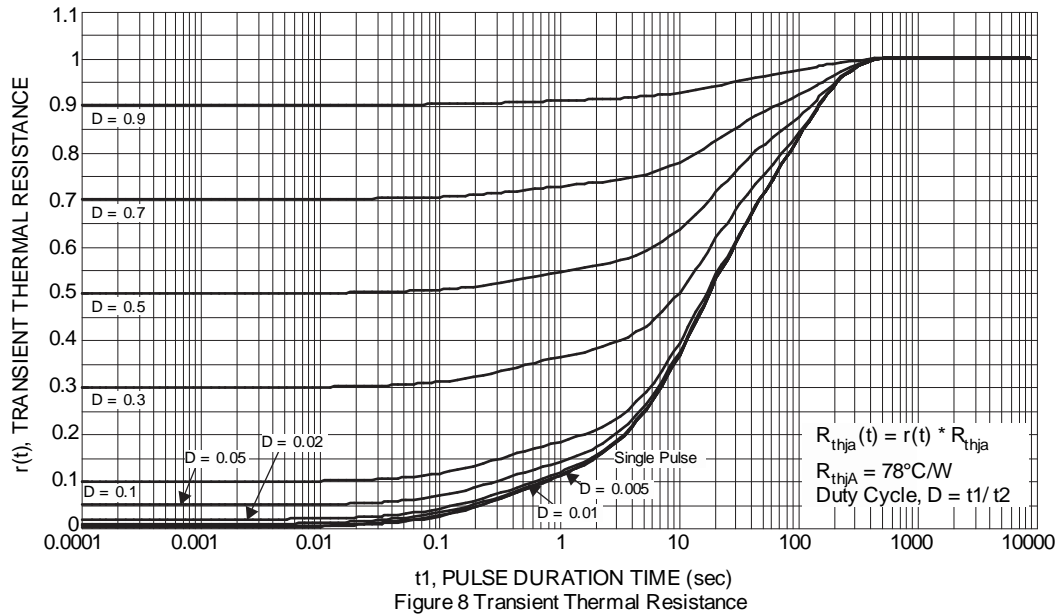
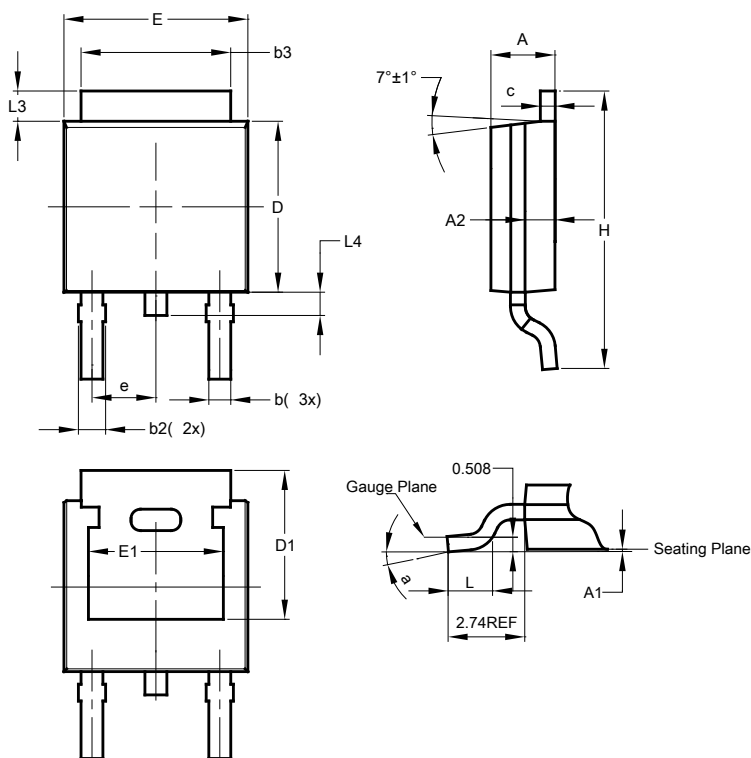


Figure 8 Transient Thermal Resistance

**Package Outline Dimensions**

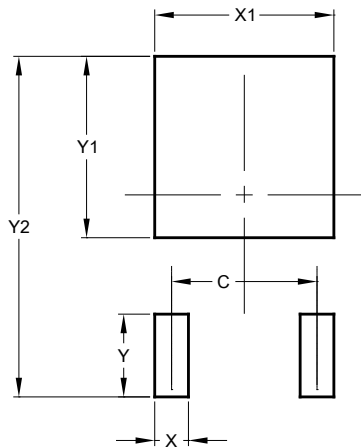
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



TO252 (DPAK)			
Dim	Min	Max	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
c	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°	-
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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