

5A SURFACE MOUNT ULTRA-FAST RECOVERY RECTIFIER

Product Summary (@ T_A = +25°C)

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

Description and Applications

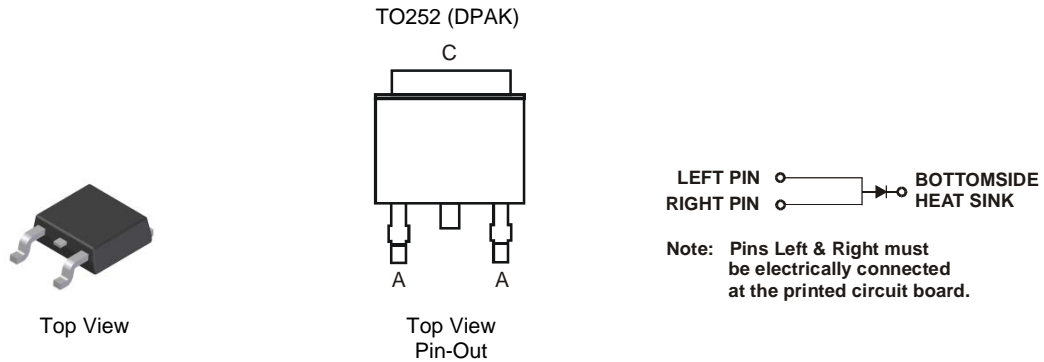
This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power DCM and CCM PFC applications. It is especially suited for use in SMPS, home appliances, office equipment, and telecommunication applications.

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 ⁽³⁾
- Polarity: See Diagram

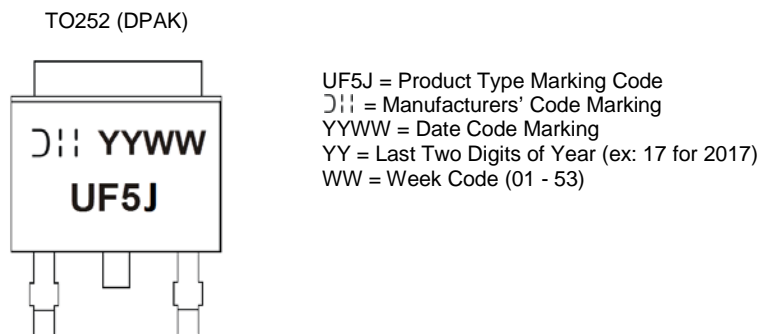


Ordering Information (Note 4)

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



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	μA	$V_R = 600\text{V}, T_J = +25^\circ\text{C}$
		—	0.04	5	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.

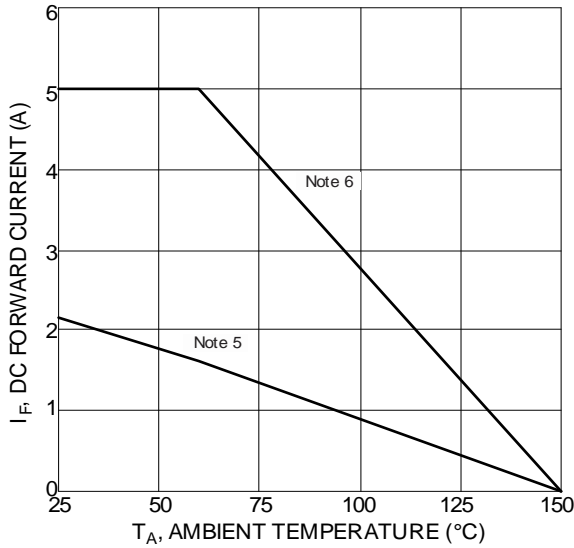


Figure 1 DC Forward Current Derating Curve

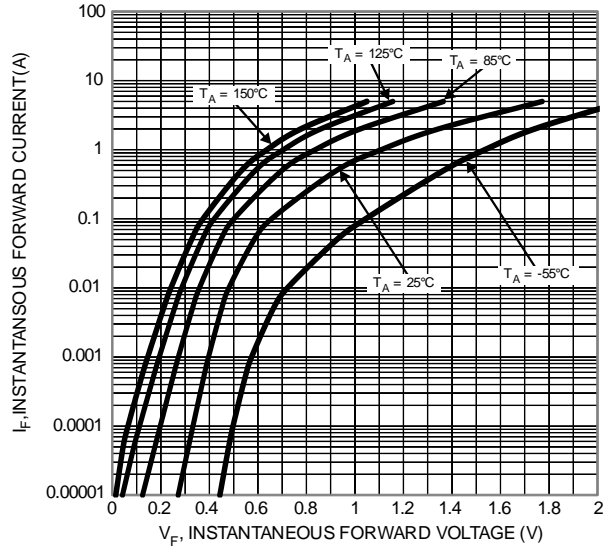


Figure 2 Typical Forward Characteristics

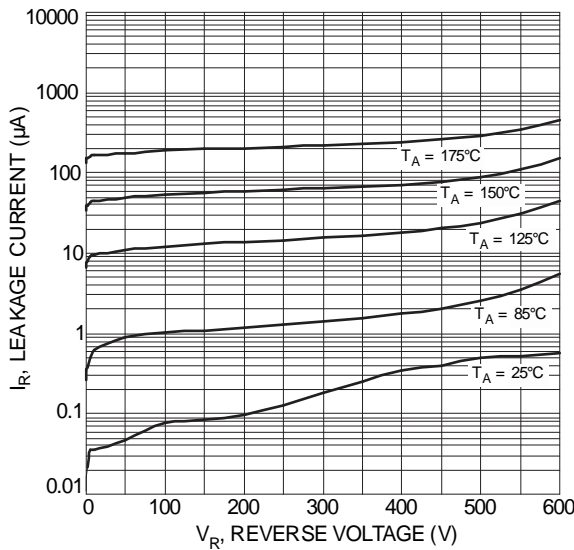


Figure 3 Typical Reverse Characteristics

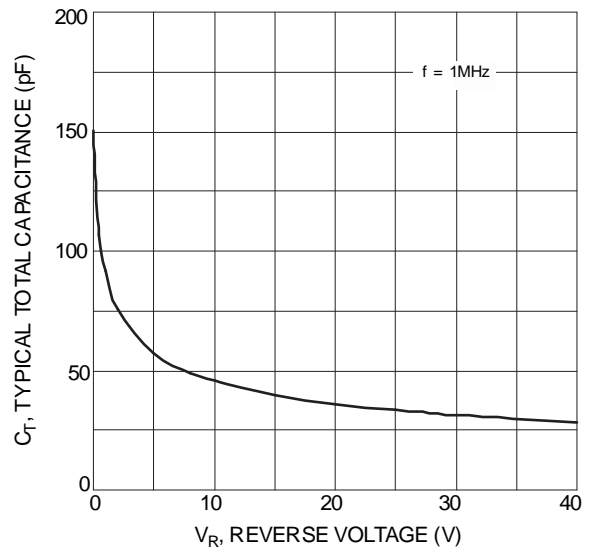


Figure 4 Typical Total Capacitance

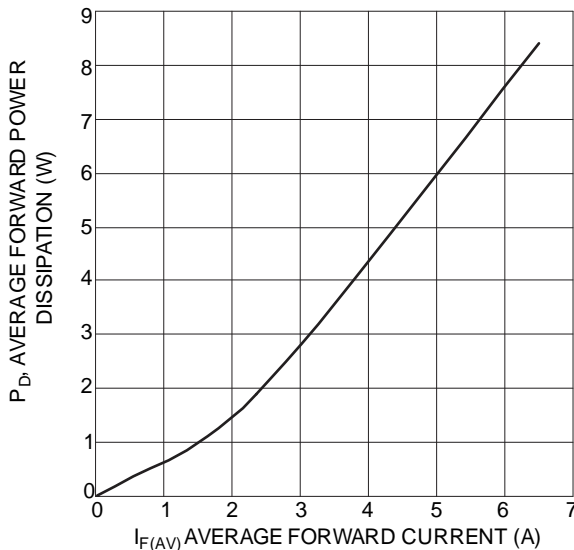


Figure 5 Forward Power Dissipation

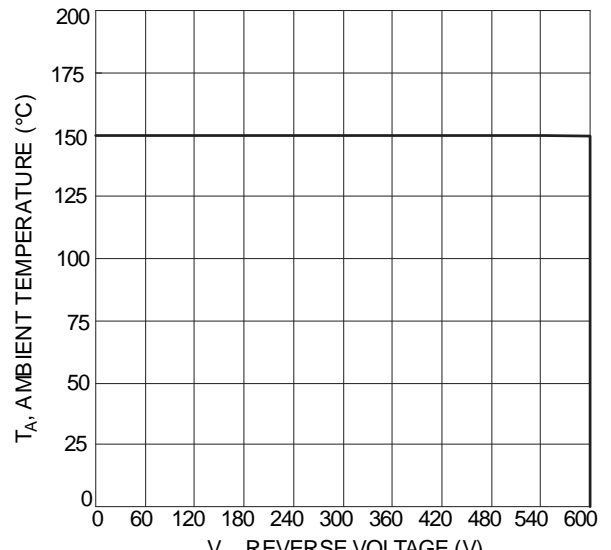
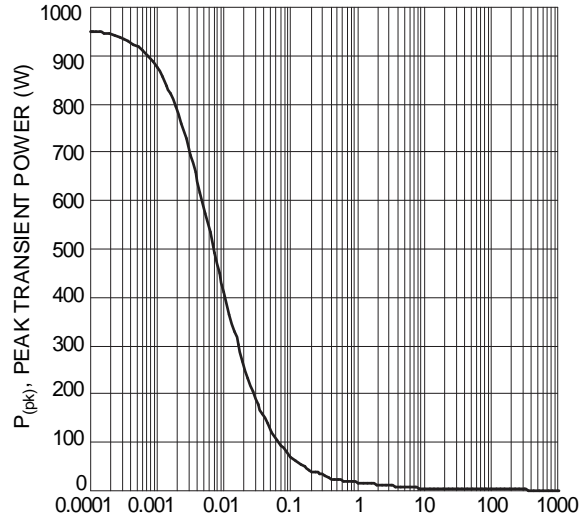
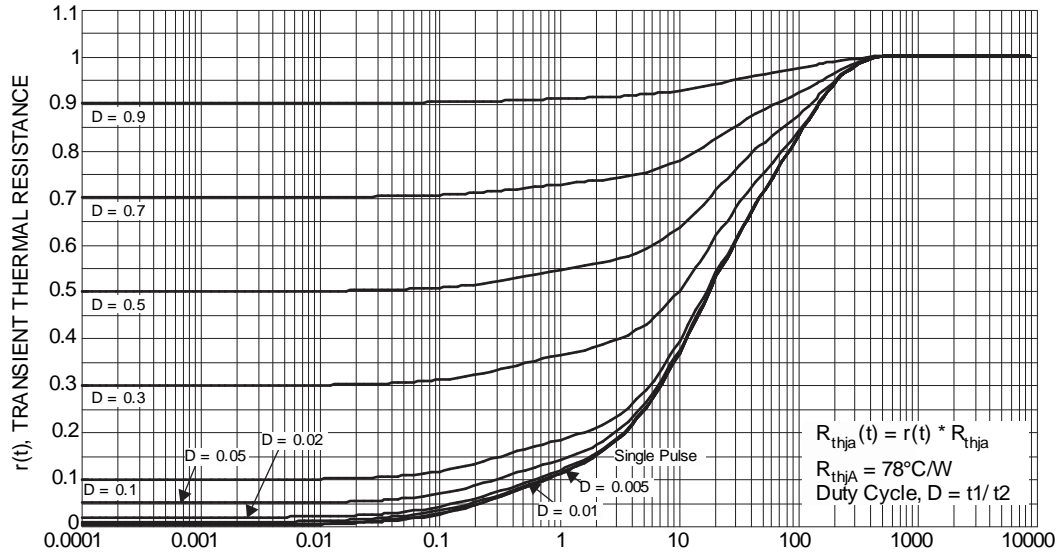


Figure 6 Operating Temperature Derating



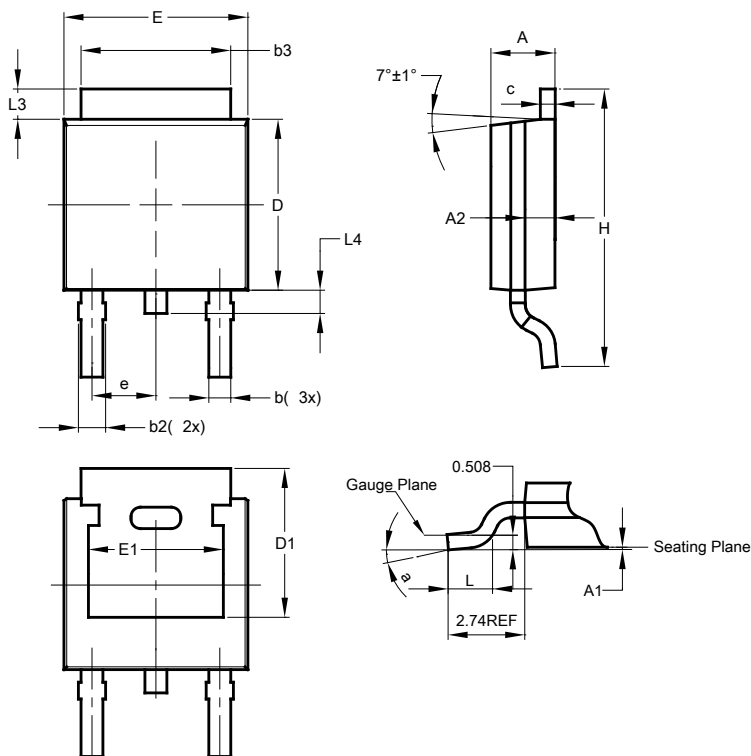
t₁, PULSE DURATION TIME (sec)
Figure 7 Single Pulse Maximum Power Dissipation



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

Package Outline Dimensions

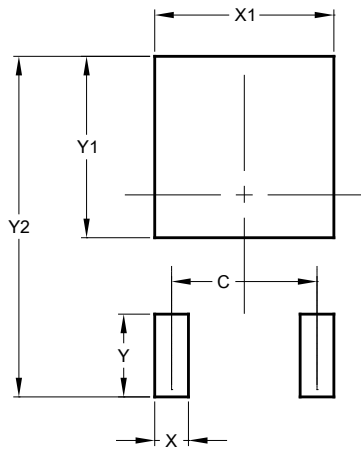
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



TO252 (DPAK)			
Dim	Min	Max	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°	-
All Dimensions in mm			

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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