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

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

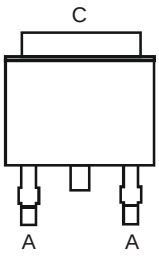
This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power DCM and CCM PFC applications. It is especially suited for use in SMPS, home appliances, office equipment, and telecommunication applications.

Mechanical Data

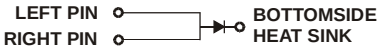
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish–Matte Tin Annealed over Copper Lead-Frame. Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram

Top View

TO252 (DPAK)



Top View
Pin-Out



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

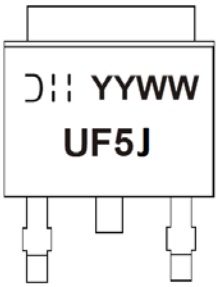
Ordering Information (Note 4)

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) & 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

TO252 (DPAK)



UF5J = Product Type Marking Code
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	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	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	80	°C/W
Typical Thermal Resistance Junction to Case (Note 6)	$R_{\theta JC}$	2	°C/W
Typical Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	18	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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

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

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.

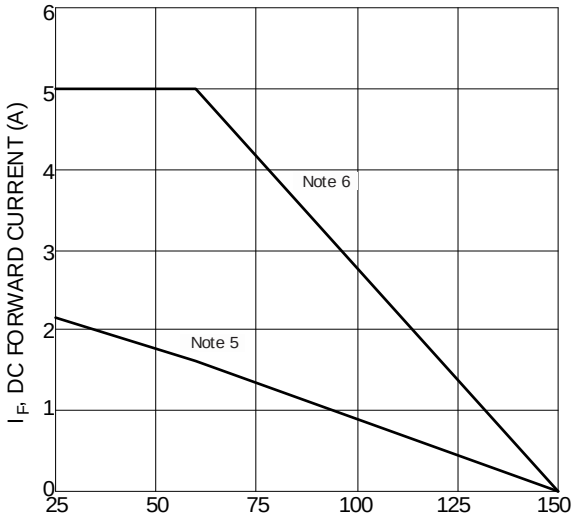


Figure 1 DC Forward Current Derating Curve

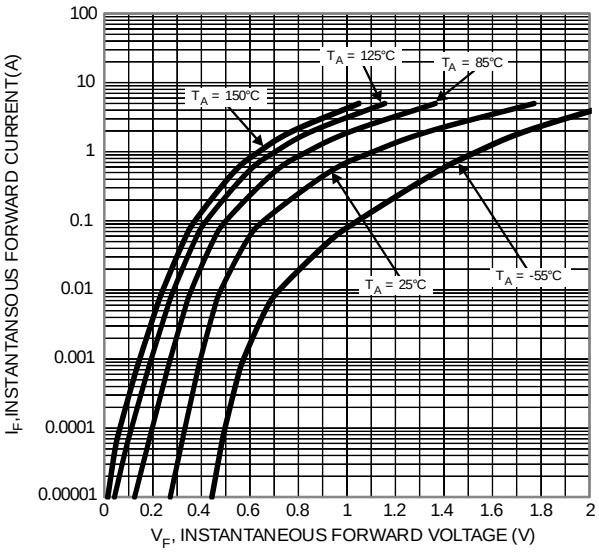


Figure 2 Typical Forward Characteristics

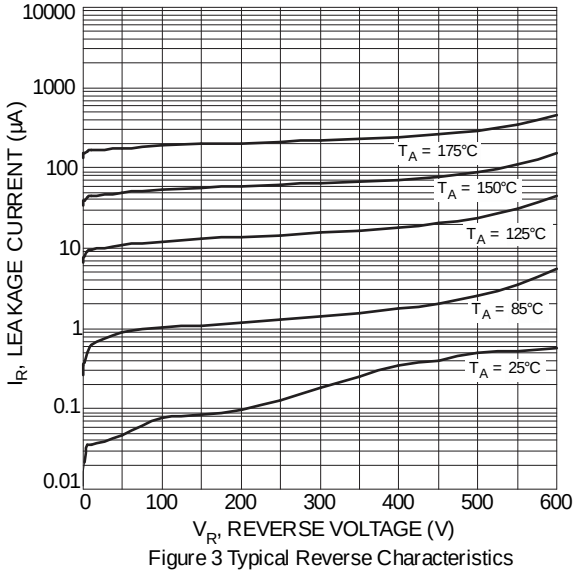


Figure 3 Typical Reverse Characteristics

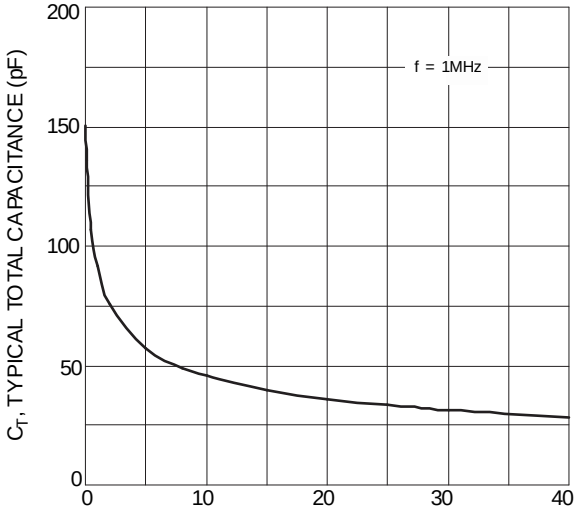


Figure 4 Typical Total Capacitance

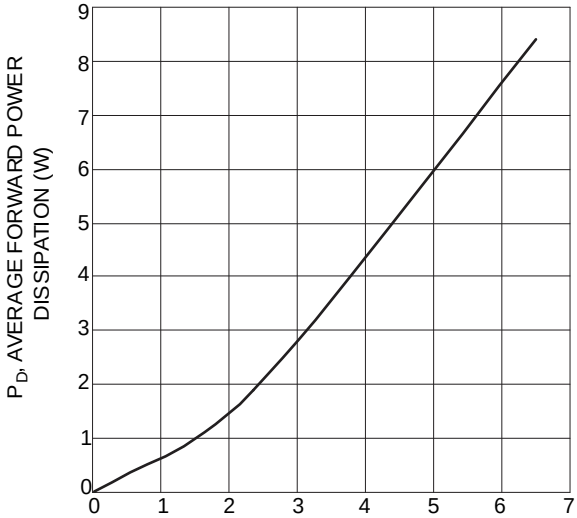


Figure 5 Forward Power Dissipation

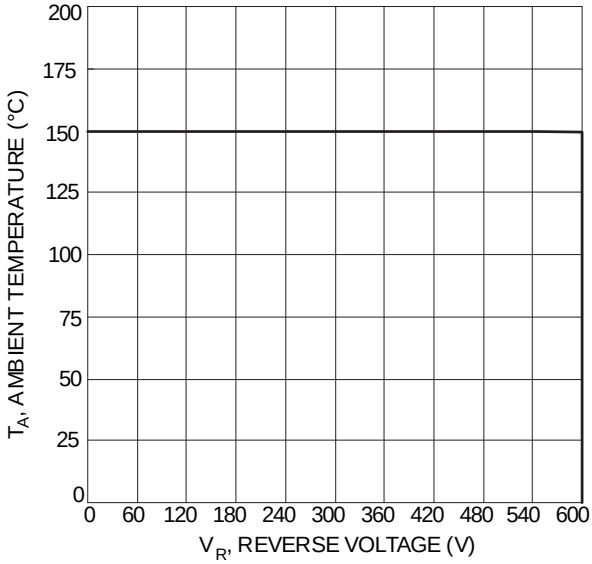


Figure 6 Operating Temperature Derating

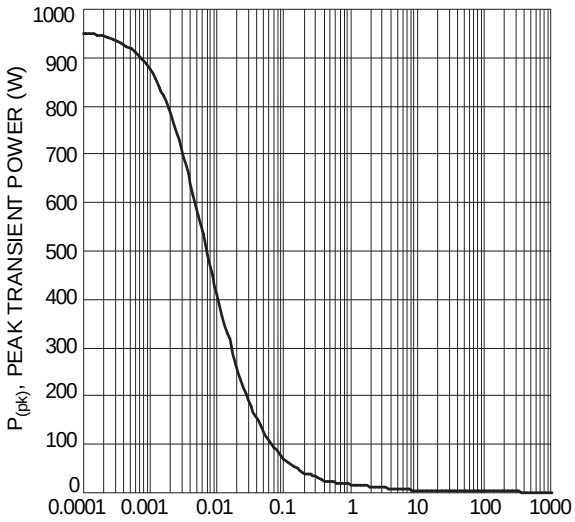


Figure 7 Single Pulse Maximum Power Dissipation

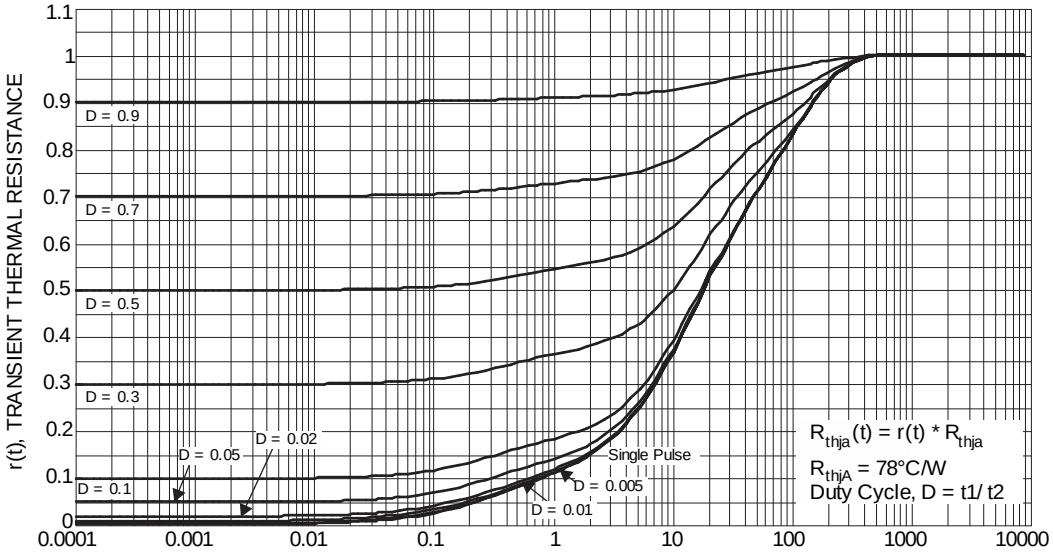
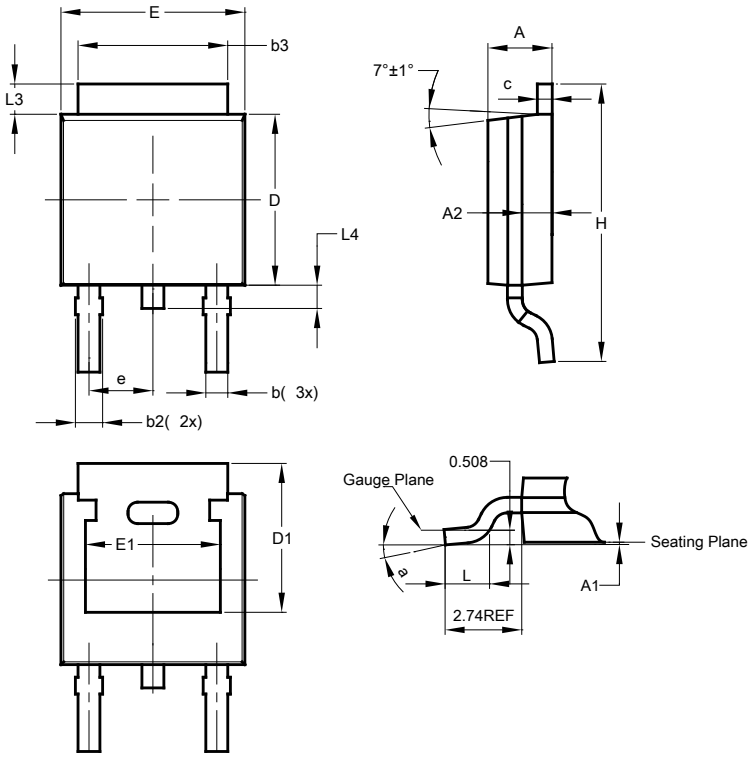


Figure 8 Transient Thermal Resistance

Package Outline Dimensions

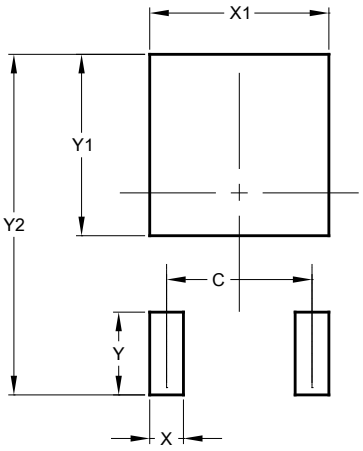
Please see http://www.diodes.com/package-outlines.html for the latest version.



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°	-
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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