

## 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

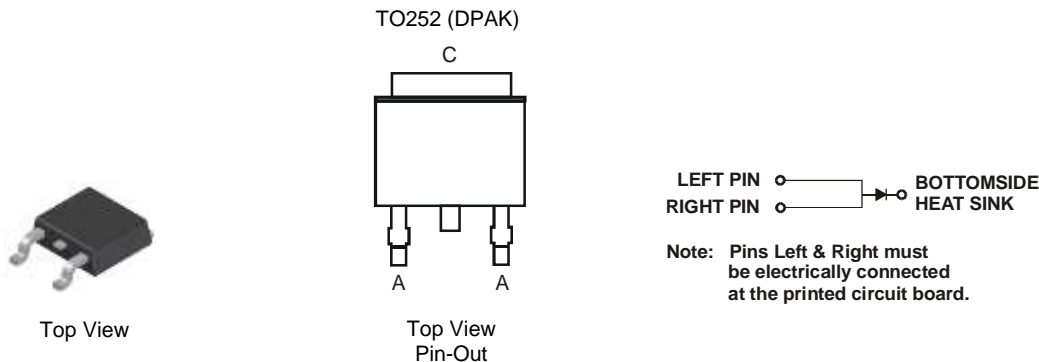
This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power DCM and CCM PFC applications. It is especially suited for use in SMPS, home appliances, office equipment, and telecommunication applications.

### 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 Leadframe. Solderable per MIL-STD-202, Method 208.
- Polarity: See Diagram

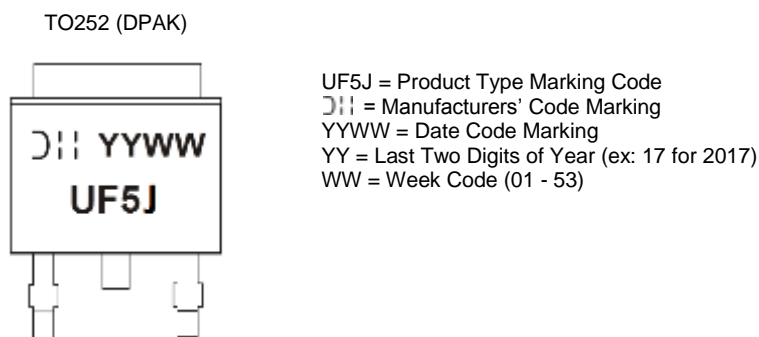


### Ordering Information (Note 4)

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) 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



**Maximum Ratings** (@T<sub>A</sub> = +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	V <sub>RRM</sub>	600	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	420	V
Average Rectified Output Current	I <sub>O</sub>	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	80	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Case (Note 5)	R <sub>θJC</sub>	18	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	R <sub>θJA</sub>	80	°C/W
Typical Thermal Resistance Junction to Case (Note 6)	R <sub>θJC</sub>	2	°C/W
Typical Thermal Resistance Junction to Ambient (Note 6)	R <sub>θJA</sub>	18	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V <sub>(BR)R</sub>	600	—	—	V	I <sub>R</sub> = 30μA
Forward Voltage	V <sub>F</sub>	—	1.1	1.6	V	I <sub>F</sub> = 1A, T <sub>J</sub> = +25°C
		—	0.7	—		I <sub>F</sub> = 1A, T <sub>J</sub> = +125°C
		—	1.5	2.3		I <sub>F</sub> = 3A, T <sub>J</sub> = +25°C
		—	1.0	—		I <sub>F</sub> = 3A, T <sub>J</sub> = +125°C
		—	1.8	3.0		I <sub>F</sub> = 5A, T <sub>J</sub> = +25°C
		—	1.2	—		I <sub>F</sub> = 5A, T <sub>J</sub> = +125°C
Reverse Leakage Current (Note 7)	I <sub>R</sub>	—	0.57	30	μA mA	V <sub>R</sub> = 600V, T <sub>J</sub> = +25°C
		—	0.04	5		V <sub>R</sub> = 600V, T <sub>J</sub> = +125°C
Reverse Recovery Time	t <sub>RR</sub>	—	15	25	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A, I <sub>rr</sub> = 0.25A
		—	12	22		I <sub>F</sub> = 1A, V <sub>R</sub> = 30V, di/dt = 100A/μs
Reverse Recovery Charge	Q <sub>RR</sub>	—	5	—	nC	I <sub>F</sub> = 1A, V <sub>R</sub> = 30V, di/dt = 100A/μs
Total Capacitance	C <sub>T</sub>	—	45	50	pf	V <sub>R</sub> = 10V <sub>DC</sub> , 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.

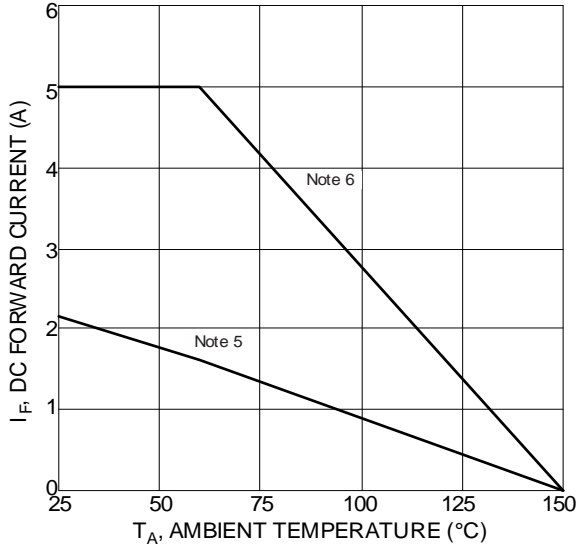


Figure 1 DC Forward Current Derating Curve

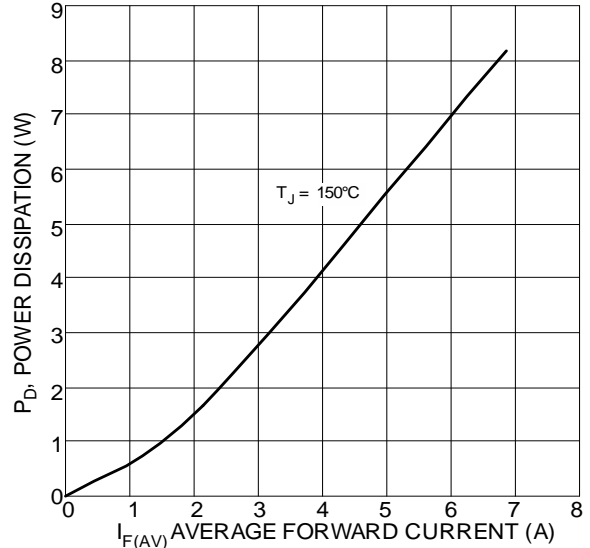


Figure 2 Forward Power Dissipation

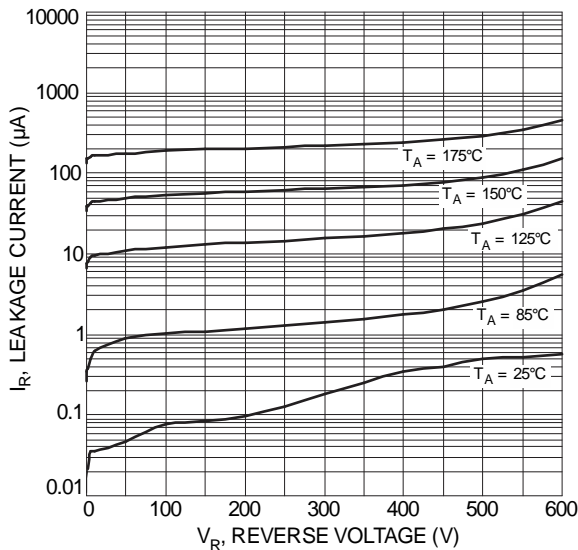


Figure 3 Typical Reverse Characteristics

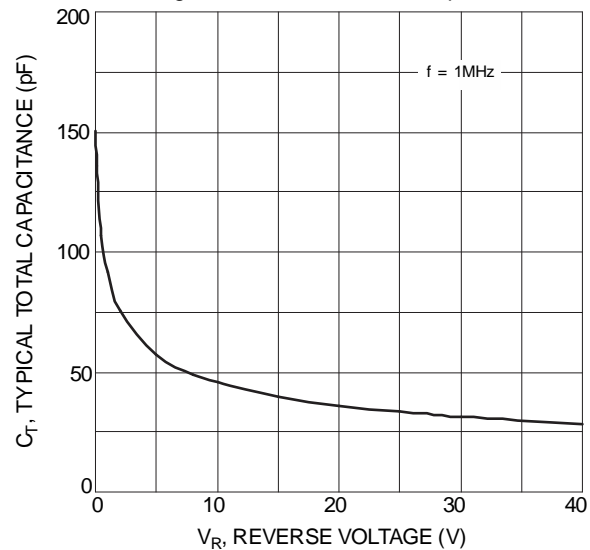


Figure 4 Typical Total Capacitance

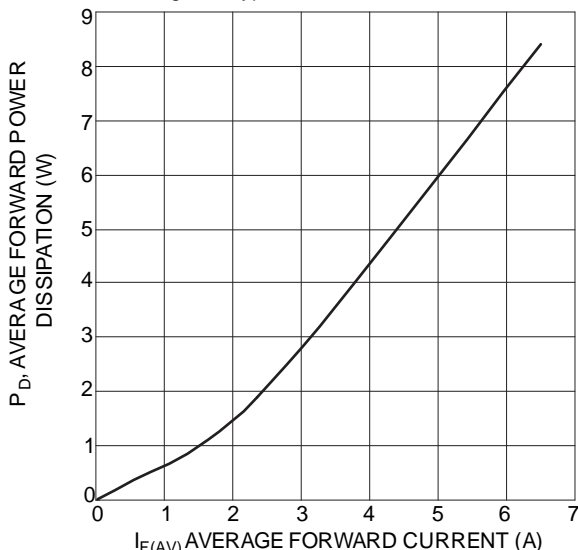


Figure 5 Forward Power Dissipation

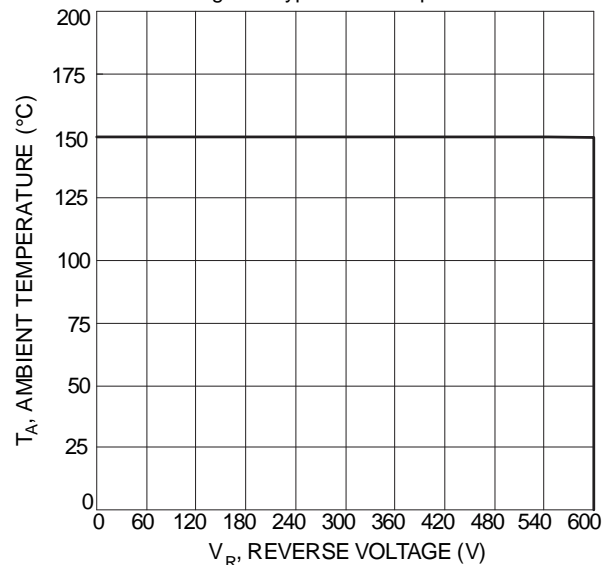
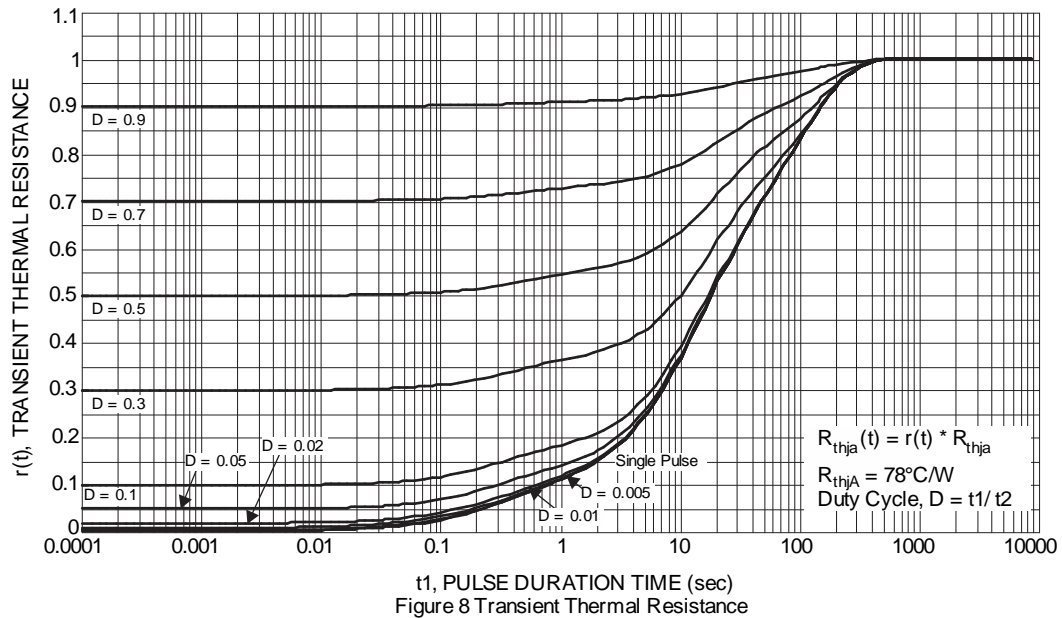
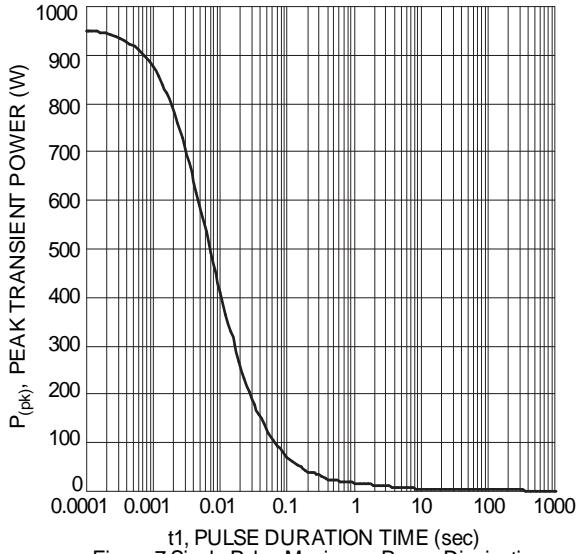


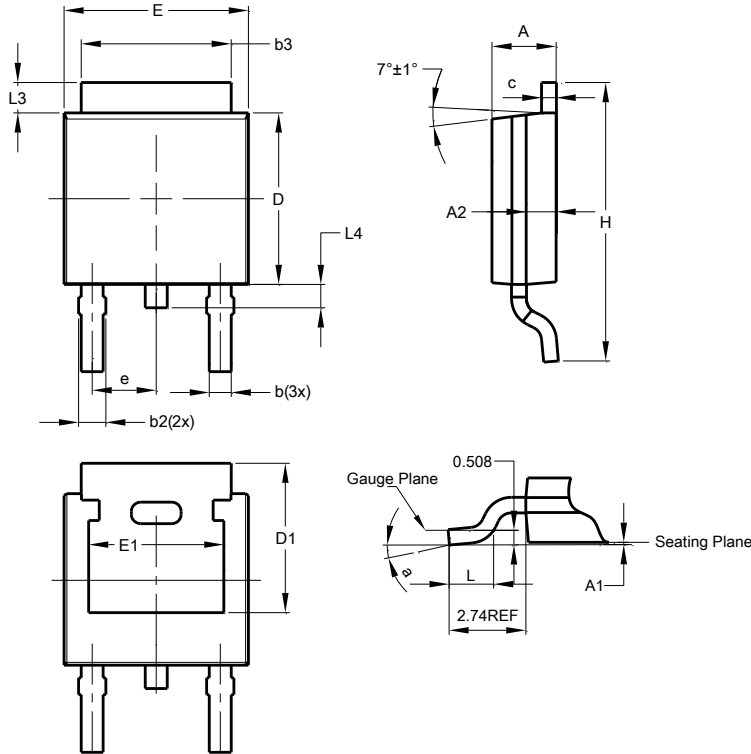
Figure 6 Operating Temperature Derating



**Package Outline Dimensions**

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

**TO252 (DPAK)**

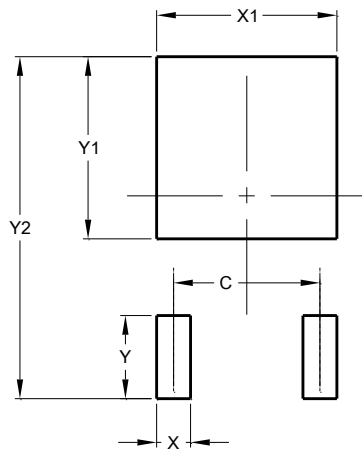


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**TO252 (DPAK)**



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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