

## Ultrafast, Soft Recovery Diode

### Features

- Ultrafast Recovery Time
- Ultrasoft Recovery
- Very Low  $I_{RRM}$
- Very Low  $Q_{rr}$
- Guaranteed Avalanche
- Specified at Operating Temperature

$$t_{rr} = 18ns$$

$$I_{F(AV)} = 8Amp$$

$$V_R = 600V$$

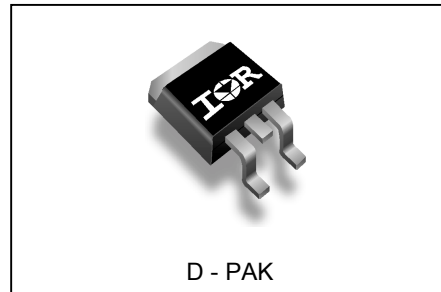
### Benefits

- Reduced RFI and EMI
- Reduced Power Loss in Diode and Switching Transistor
- Higher Frequency Operation
- Reduced Snubbing
- Reduced Parts Count

### Description/ Applications

These diodes are optimized to reduce losses and EMI/RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for freewheeling, flyback, power converters, motor drives, and other applications where high speed and reduced switching losses are design requirements.

### Package Outline



### Absolute Maximum Ratings

Parameters	Max	Units
$V_{RRM}$ Cathode-to-Anode Voltage	600	V
$I_{F(AV)}$ Continuous Forward Current $T_C = 100^\circ C$	8	A
$I_{FSM}$ Single Pulse Forward Current	60	
$I_{FRM}$ Peak Repetitive Forward Current	24	
$P_D$ Maximum Power Dissipation $T_C = 100^\circ C$	14	W
$T_J, T_{STG}$ Operating Junction and Storage Temperatures	- 55 to 150	$^\circ C$

**Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

Parameters	Min	Typ	Max	Units	Test Conditions
$V_{BR}$ , $V_r$ Breakdown Voltage, Blocking Voltage	600	-	-	V	$I_R = 100\mu\text{A}$
$V_F$ Forward Voltage See Fig. 1	-	1.4	1.7	V	$I_F = 8\text{A}$
	-	1.7	2.1	V	$I_F = 16\text{A}$
	-	1.4	1.7	V	$I_F = 8\text{A}$ , $T_J = 125^\circ\text{C}$
$I_R$ Max. Reverse Leakage Current	-	0.3	5.0	$\mu\text{A}$	$V_R = V_R$ Rated
	-	100	500	$\mu\text{A}$	$T_J = 125^\circ\text{C}$ , $V_R = 0.8 \times V_R$ Rated
$C_T$ Junction Capacitance	-	10	25	pF	$V_R = 200\text{V}$
$L_S$ Series Inductance	-	8.0	-	nH	Measured lead to lead 5mm from package body

**Dynamic Recovery Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

Parameters	Min	Typ	Max	Units	Test Conditions
$t_{rr}$ Reverse Recovery Time	-	18	-	ns	$I_F = 1.0\text{A}$ , $di_F/dt = 200\text{A}/\mu\text{A}$ , $V_R = 30\text{V}$
	-	37	55		$T_J = 25^\circ\text{C}$
	-	55	90		$T_J = 125^\circ\text{C}$
$I_{RRM}$ Peak Recovery Current	-	3.5	5.0	A	$T_J = 25^\circ\text{C}$
	-	4.5	8.0		$T_J = 125^\circ\text{C}$
$Q_{rr}$ Reverse Recovery Charge	-	65	138	nC	$T_J = 25^\circ\text{C}$
	-	124	360		$T_J = 125^\circ\text{C}$
$di(\text{rec})/dt$ Rate of Fall of recovery Current	-	240	-	A/ $\mu\text{s}$	$T_J = 25^\circ\text{C}$
	-	210	-		$T_J = 125^\circ\text{C}$

$I_F = 8\text{A}$   
 $V_R = 200\text{V}$   
 $di_F/dt = 200\text{A}/\mu\text{s}$

**Thermal - Mechanical Characteristics**

Parameters	Min	Typ	Max	Units
$T_J$ Max. Junction Temperature Range	-	-	- 55 to 150	$^\circ\text{C}$
$T_{Stg}$ Max. Storage Temperature Range	-	-	- 55 to 150	
$T_{lead}$ Lead Temperature	-	-	300	$^\circ\text{C}/\text{W}$
$R_{thJC}$ Thermal Resistance, Junction to Case	-	-	3.5	
$R_{thJA}$ ① Thermal Resistance, Junction to Ambient	-	-	80	
$Wt$ Weight	-	2.0	-	g
	-	0.07	-	(oz)

① Typical Socket Mount

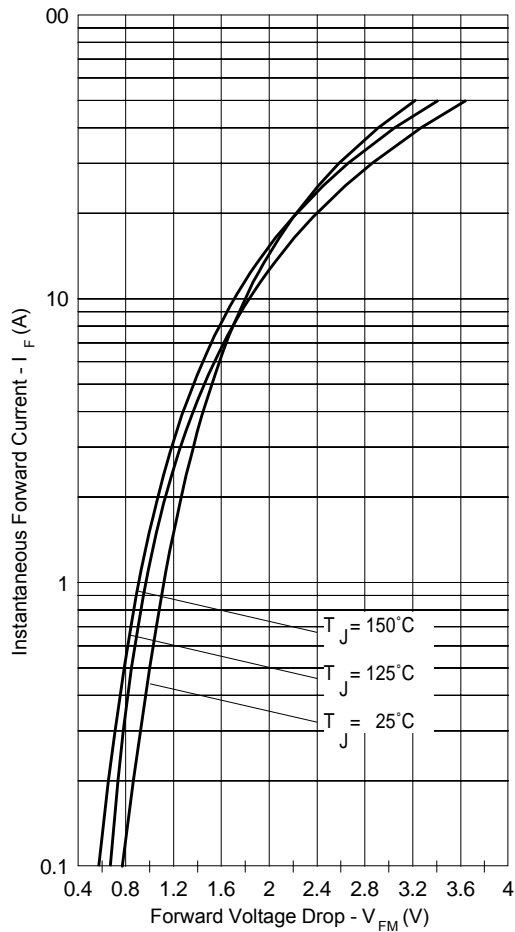


Fig. 1 - Typical Forward Voltage Drop Characteristics

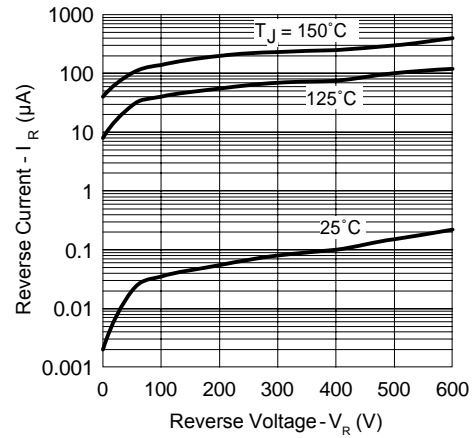


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

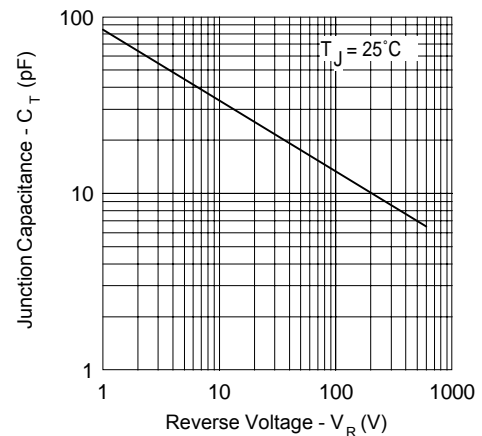


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

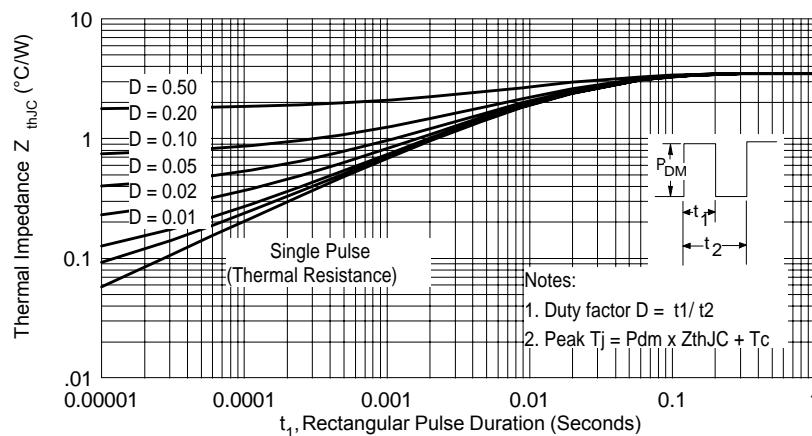
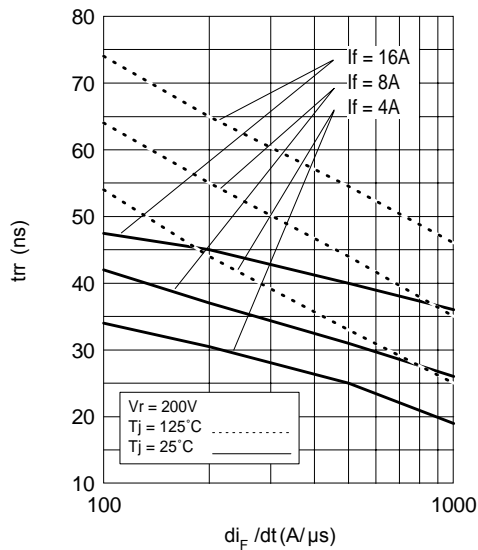
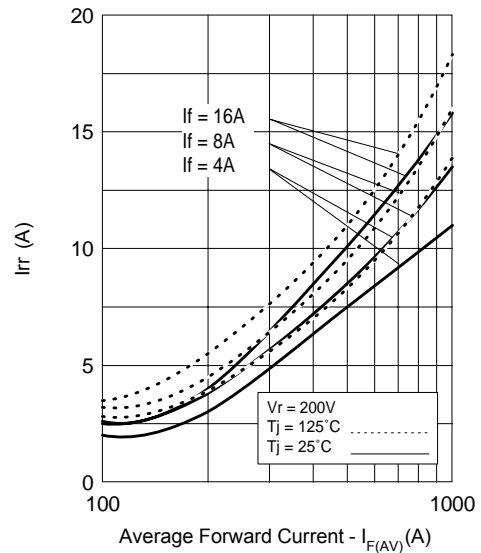
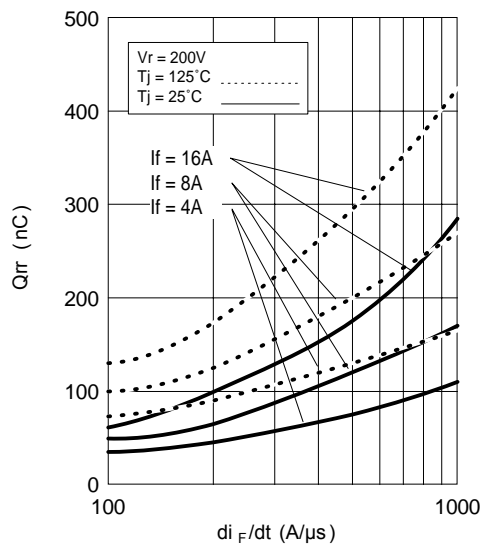
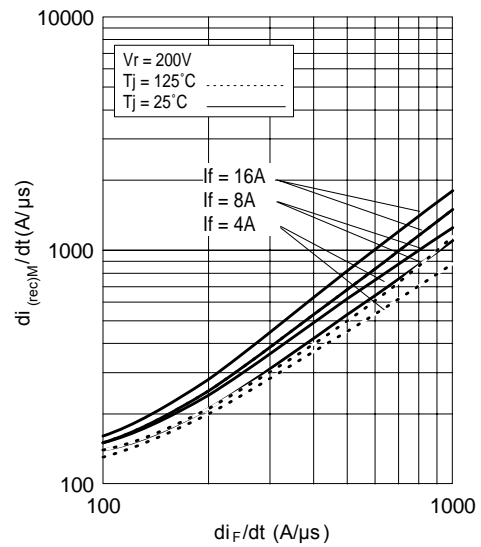
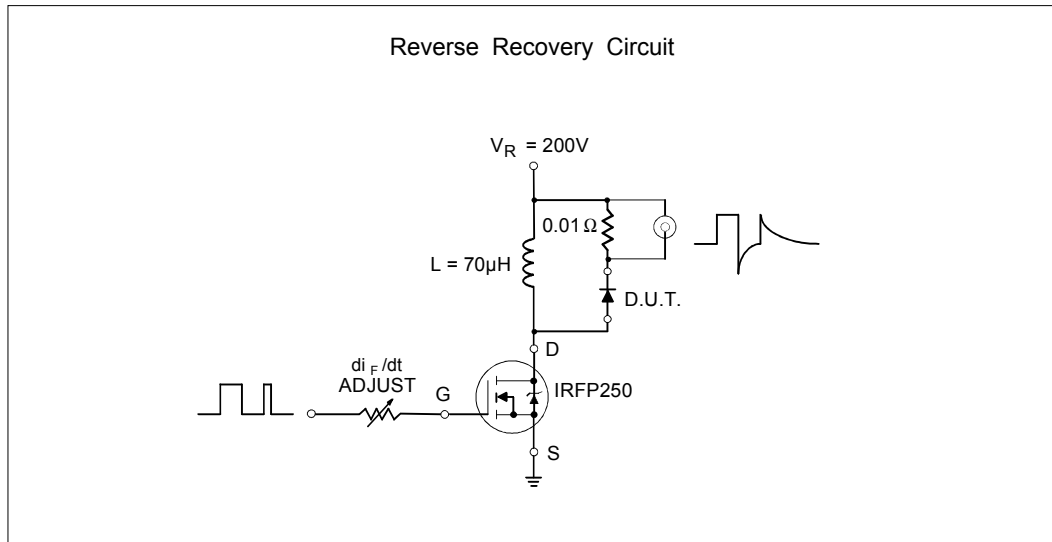
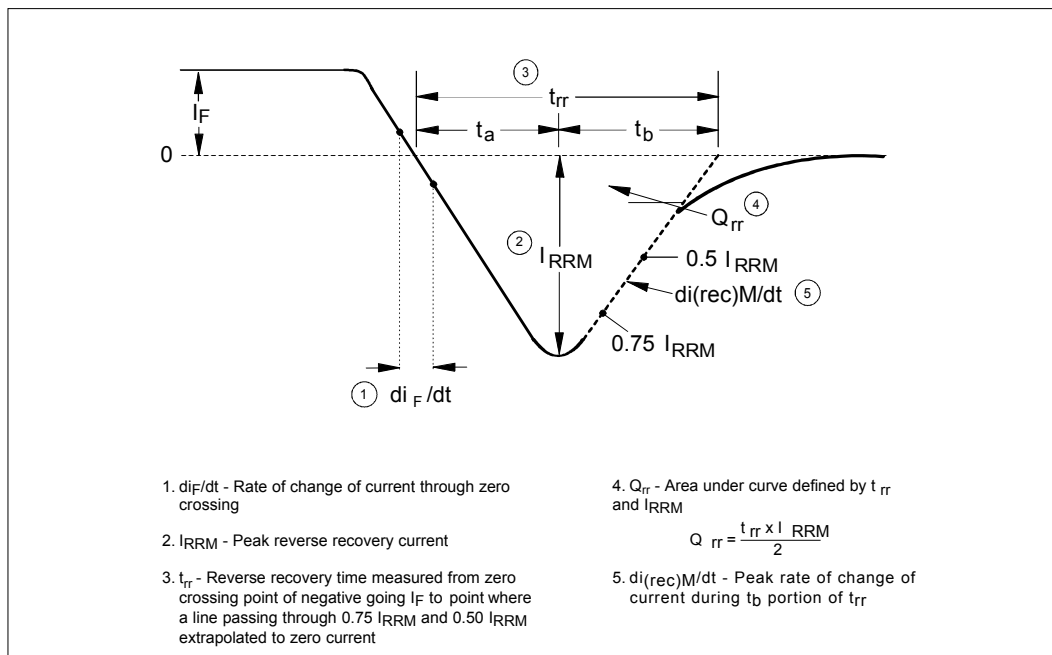


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics

Fig. 5 - Typical Reverse Recovery vs.  $di_F/dt$ Fig. 6 - Typical Recovery Current vs.  $di_F/dt$ Fig. 7 - Typical Stored Charge vs.  $di_F/dt$ Fig. 8 - Typical  $di_{(rec)M}/dt$  vs.  $di_F/dt$

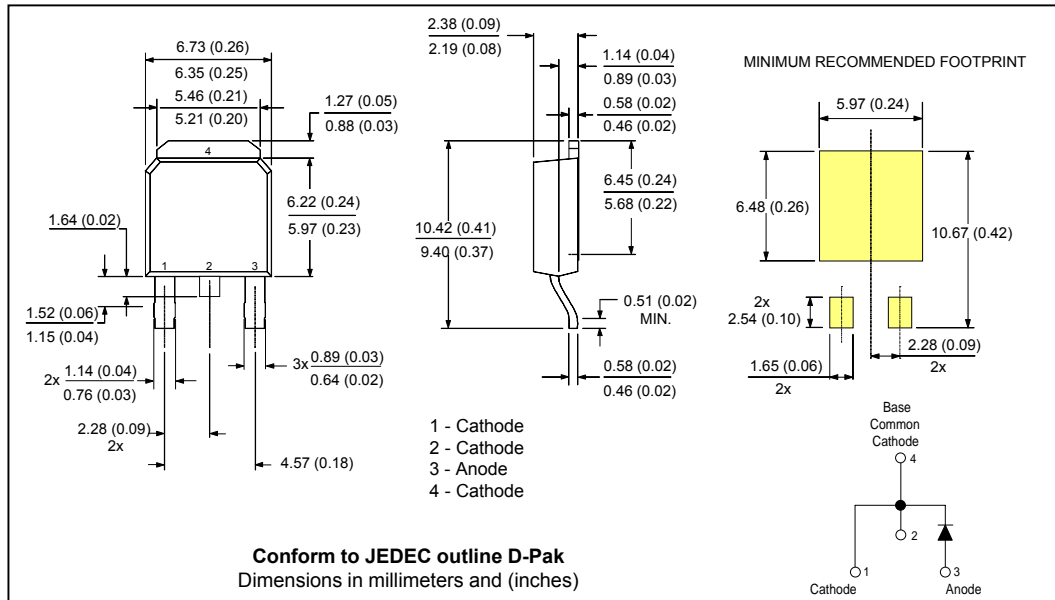


**Fig. 9- Reverse Recovery Parameter Test Circuit**

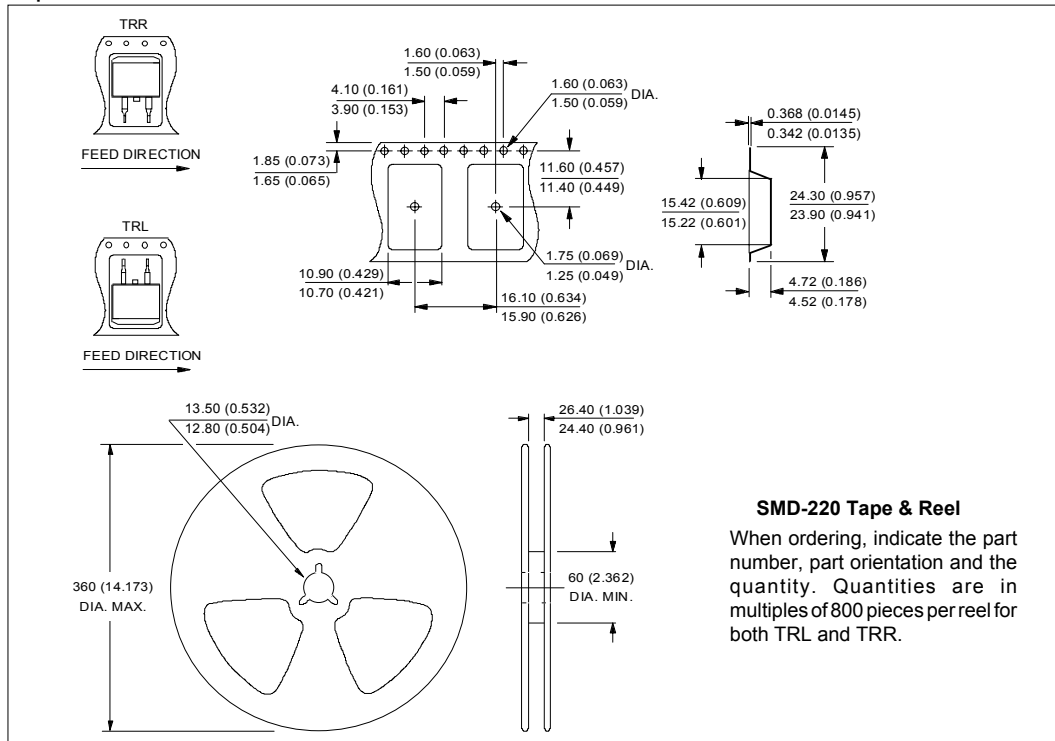


**Fig. 10 - Reverse Recovery Waveform and Definitions**

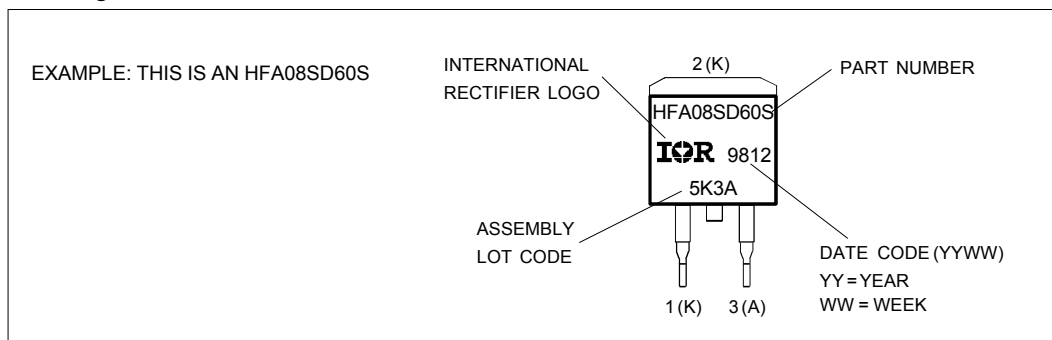
## Outline Table



## Tape &amp; Reel Information



## Marking Information



## Ordering Information Table

Device Code					
HF	A	08	SD	60	S
1	2	3	4	5	6
1	2	3	4	5	6
1	-	Hexfred Family			
2	-	Electron Irradiated			
3	-	Current Rating (08 = 8A)			
4	-	D-PAK			
5	-	Voltage Rating (60 = 600V)			
6	-	Suffix			

S = D<sup>2</sup>PAK/ Dpak  
 TR = Tape & Reel  
 TRL = Tape & Reel Left  
 TRR = Tape & Reel Right

Data and specifications subject to change without notice.  
 This product has been designed and qualified for Industrial Level.  
 Qualification Standards can be found on IR's Web site.