Bulletin PD-20618 07/00

International
IOR Rectifier

HFA08SD60S

Ultrafast, Soft Recovery Diode

t_{rr} = 18ns
$I_{F(AV)}$ = 8Amp
V_R = 600V

Features

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

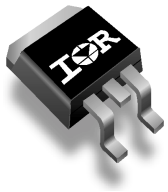
Benefits

- 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



D - PAK

Absolute Maximum Ratings

	Parameters	Max	Units
V_{RRM}	Cathode-to-Anode Voltage	600	V
$I_{F(AV)}$	Continuous Forward Current T_C = 100°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°C	14	W
T_J, T_{STG}	Operating Junction and Storage Temperatures	- 55 to 150	°C

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

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

Dynamic Recovery Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions	
t_{rr}	Reverse Recovery Time	-	18	-	ns	I_F = 1.0A, di_F/dt = 200A/µA, V_R = 30V	
		-	37	55		T_J = 25°C	I_F = 8A V_R = 200V di_F/dt = 200A/µs
		-	55	90		T_J = 125°C	
I_{RRM}	Peak Recovery Current	-	3.5	5.0	A	T_J = 25°C	
		-	4.5	8.0		T_J = 125°C	
Q_{rr}	Reverse Recovery Charge	-	65	138	nC	T_J = 25°C	
		-	124	360		T_J = 125°C	
$di_{(rec)M}/dt$	Rate of Fall of recovery Current	-	240	-	A/µs	T_J = 25°C	
		-	210	-		T_J = 125°C	

Thermal - Mechanical Characteristics

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

① Typical Socket Mount

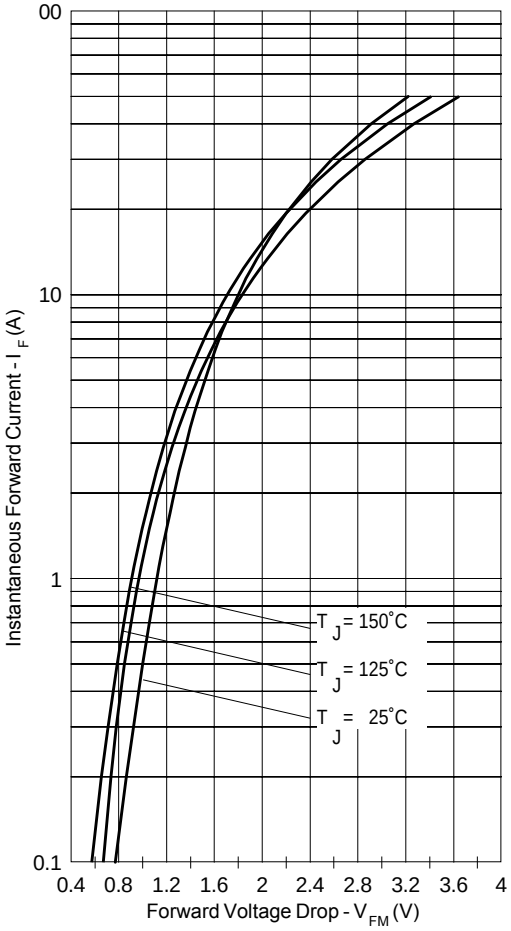


Fig. 1 - Typical Forward Voltage Drop Characteristics

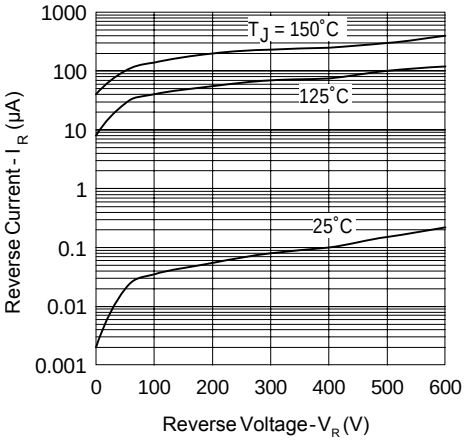


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

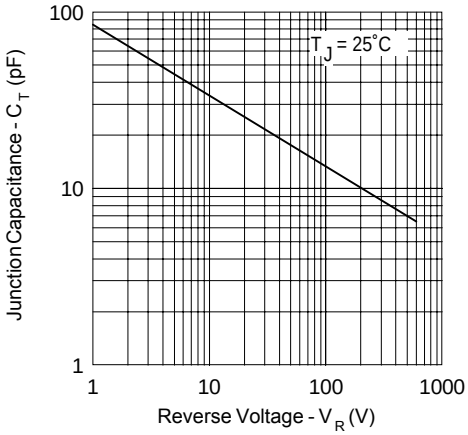


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

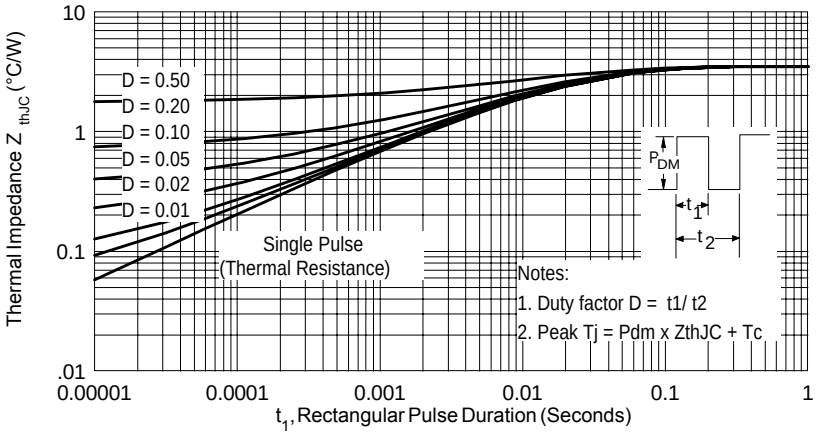


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

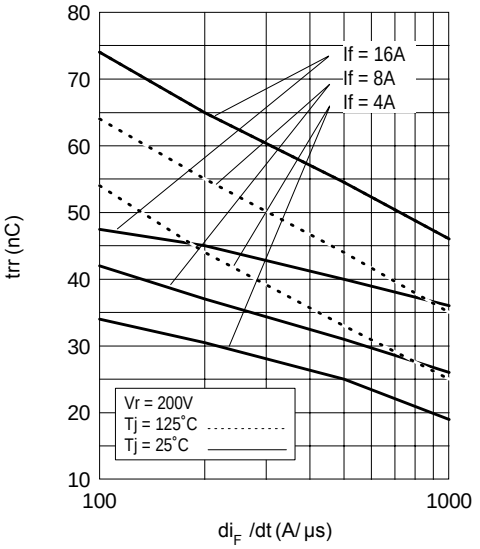


Fig. 5 - Typical Reverse Recovery vs. di_F/dt

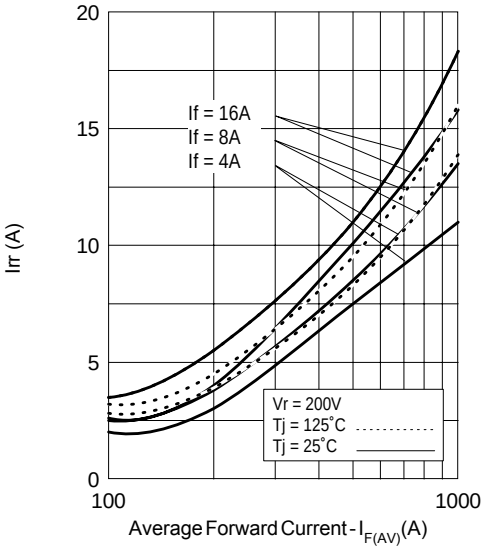


Fig. 6 - Typical Recovery Current vs. di_F/dt

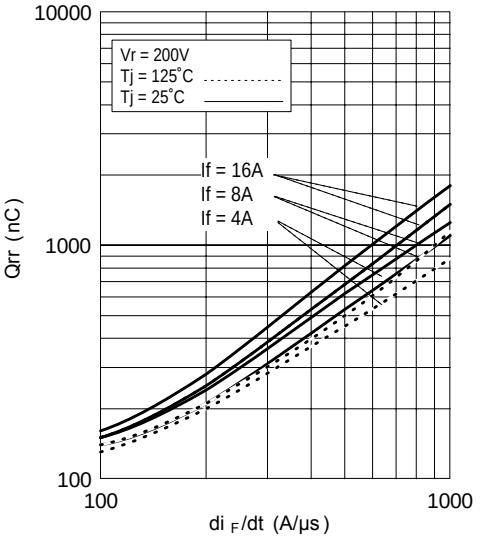


Fig. 7 - Typical Stored Charge vs. di_F/dt

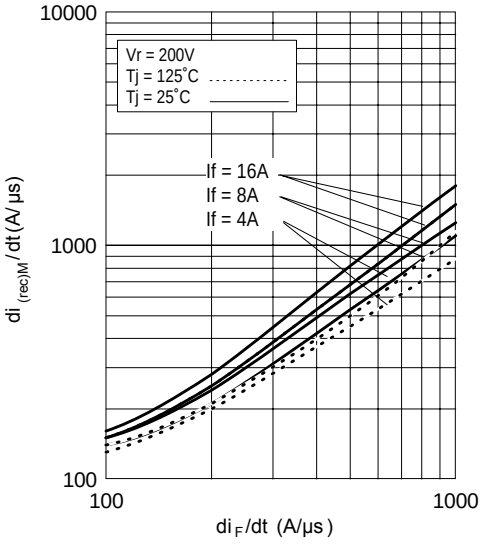


Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_F/dt

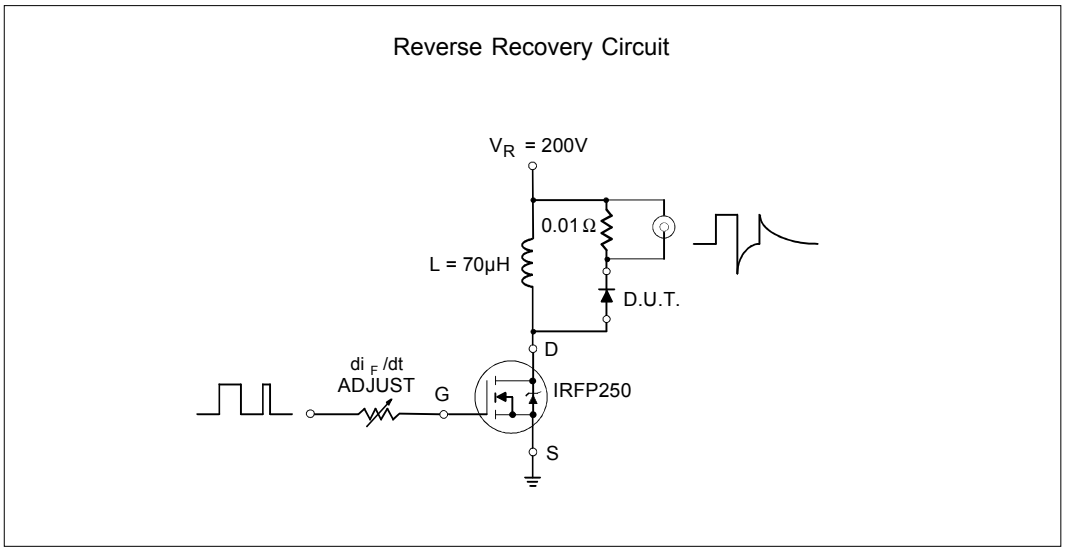
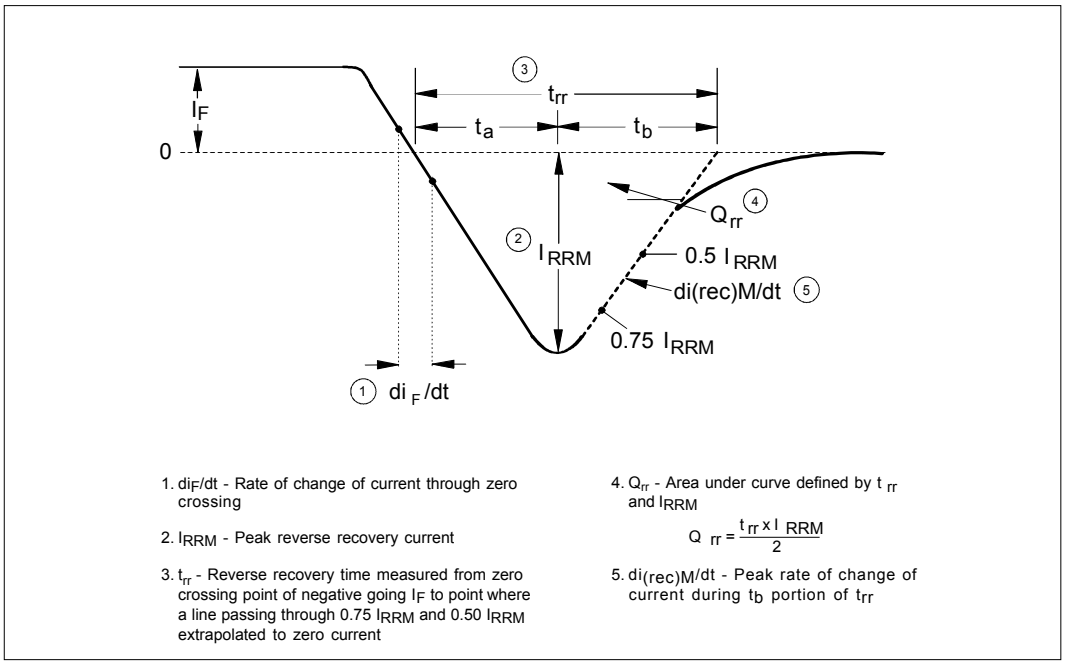


Fig. 9- Reverse Recovery Parameter Test Circuit



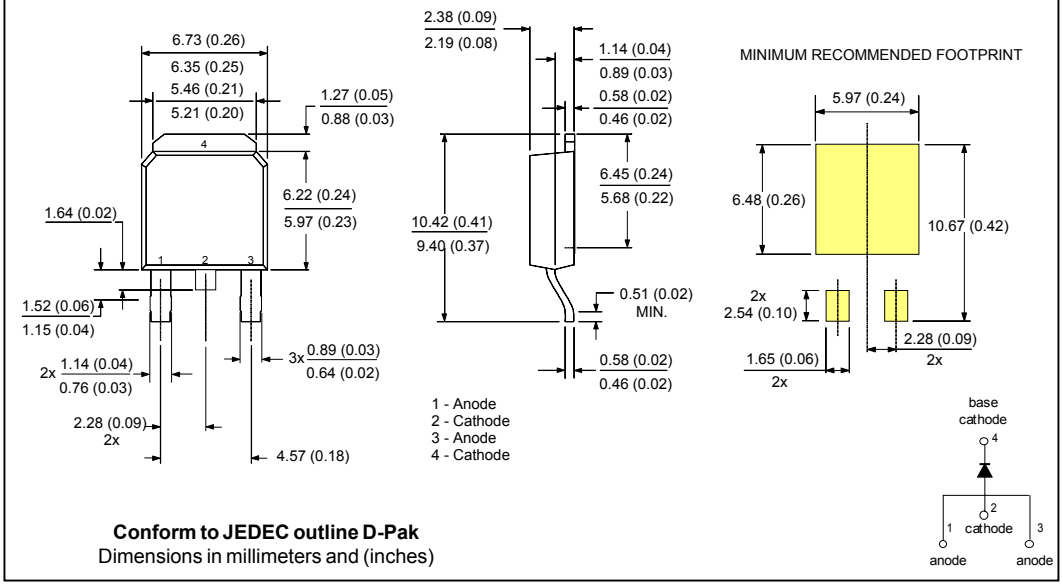
1. di_F/dt - Rate of change of current through zero crossing
2. I_{RRM} - Peak reverse recovery current
3. t_{rr} - Reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through 0.75 I_{RRM} and 0.50 I_{RRM} extrapolated to zero current
4. Q_{rr} - Area under curve defined by t_{rr} and I_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

5. $di_{(rec)M}/dt$ - Peak rate of change of current during t_b portion of t_{rr}

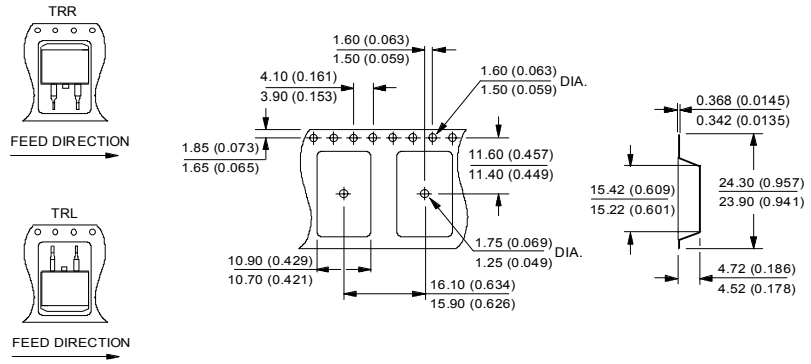
Fig. 10 - Reverse Recovery Waveform and Definitions

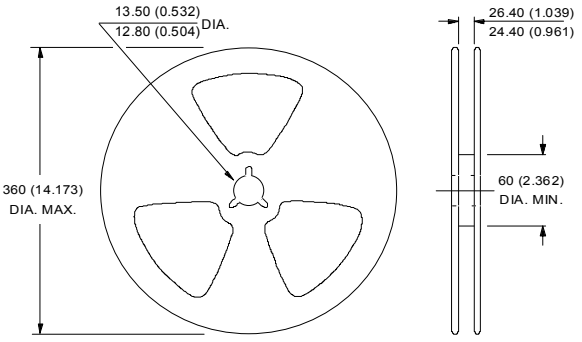
Outline Table



Conform to JEDEC outline D-Pak
Dimensions in millimeters and (inches)

Tape & Reel Information

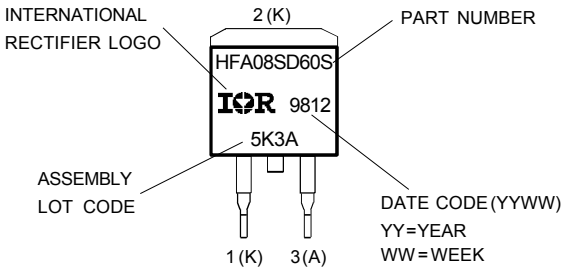




SMD-220 Tape & Reel
When ordering, indicate the part number, part orientation and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

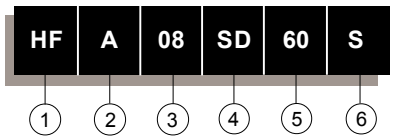
Marking Information

EXAMPLE: THIS IS AN HFA08SD60S



Ordering Information Table

Device Code



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

S = D^2PAK/ Dpak
TR = Tape & Reel
TRL = Tape & Reel Left
TRR = Tape & Reel Right

International
IOR Rectifier

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EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.
IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
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