

Ultrafast, Soft Recovery Diode

Features

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

$$t_{rr} = 38ns$$

$$I_{F(AV)} = 4Amp$$

$$V_R = 600V$$

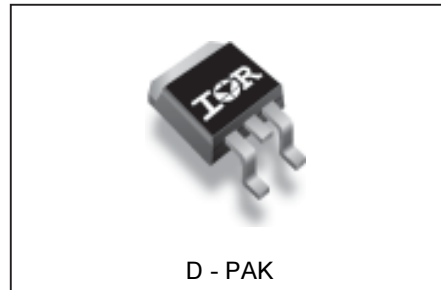
Benefits

- 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 $T_C = 100^\circ C$ | 4 | A |
| I_{FSM} | Single Pulse Forward Current | 25 | |
| I_{FRM} | Peak Repetitive Forward Current $T_C = 116^\circ C$ | 16 | |
| P_D | Maximum Power Dissipation $T_C = 100^\circ C$ | 10 | W |
| T_J, T_{STG} | Operating Junction and Storage Temperatures | - 55 to 150 | $^\circ C$ |

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 See Fig. 1 | - | 1.5 | 1.8 | V | I _F = 4A |
| | - | 1.8 | 2.2 | V | I _F = 8A |
| | - | 1.4 | 1.7 | V | I _F = 4A, T _J = 125°C |
| I _R Max. Reverse Leakage Current | - | 0.17 | 3.0 | μA | V _R = V _R Rated |
| | - | 44 | 300 | μA | T _J = 125°C, V _R = 0.8 x V _R Rated |
| C _T Junction Capacitance | - | 4 | 8 | 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 | - | 17 | - | ns | I _F = 1.0A, di _F /dt = 200A/μA, V _R = 30V |
| | - | 28 | 42 | | T _J = 25°C |
| | - | 38 | 57 | | T _J = 125°C |
| I _{RRM} Peak Recovery Current | - | 2.9 | 5.2 | A | T _J = 25°C |
| | - | 3.7 | 6.7 | | T _J = 125°C |
| Q _{rr} Reverse Recovery Charge | - | 40 | 60 | nC | T _J = 25°C |
| | - | 70 | 105 | | T _J = 125°C |
| di _(rec) /dt Rate of Fall of recovery Current | - | 280 | - | A/μs | T _J = 25°C |
| | - | 235 | - | | 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 _S Soldering Temperature, 10 sec | - | - | 240 | |
| R _{thJC} Thermal Resistance, Junction to Case | - | - | 5.0 | °C/ W |
| R _{thJA} ^① Thermal Resistance, Junction to Ambient | - | - | 80 | |
| Wt Weight | - | 2.0 | - | g |
| | - | 0.07 | - | (oz) |
| T Mounting Torque | 6.0 | - | 12 | Kg*cm |
| | 5.0 | - | 10 | lbf*in |

① Typical Socket Mount

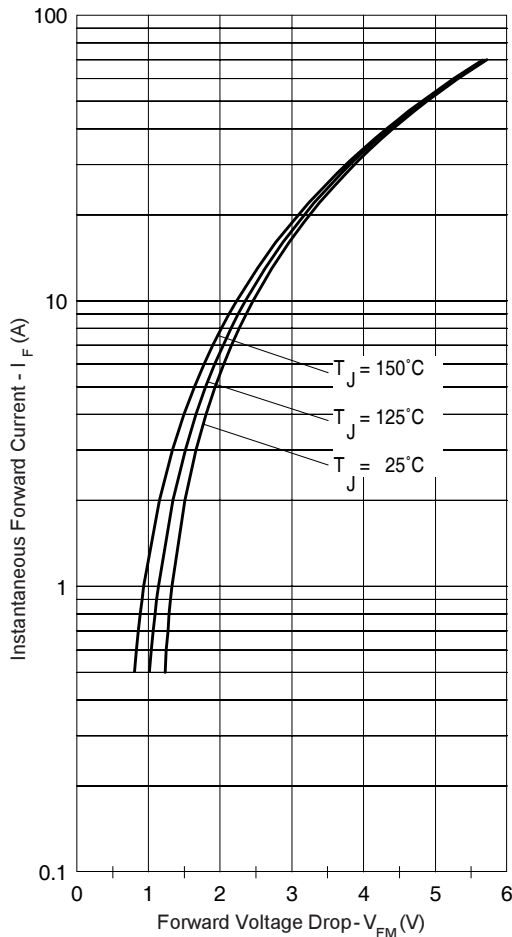


Fig. 1 - Typical Forward Voltage Drop Characteristics

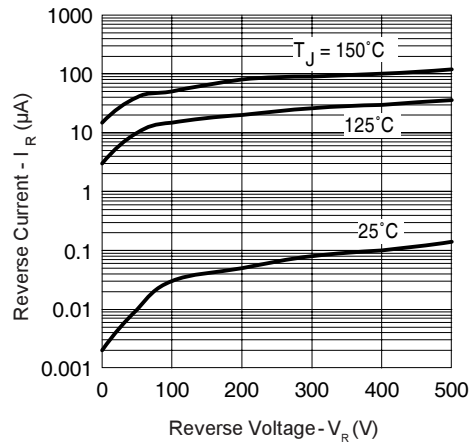


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

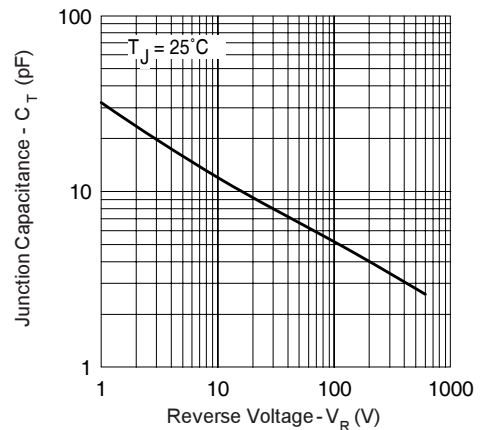


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

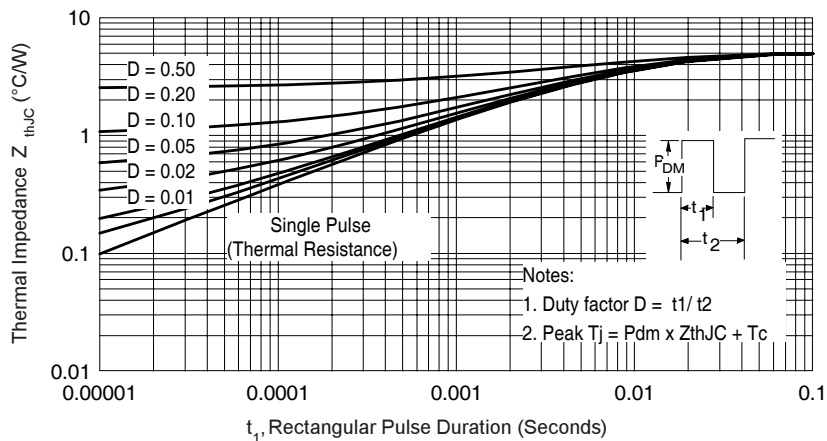


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

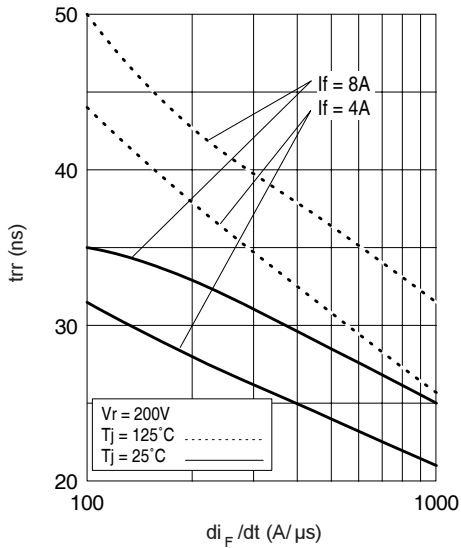


Fig. 5 - Typical Reverse Recovery vs. di_F/dt

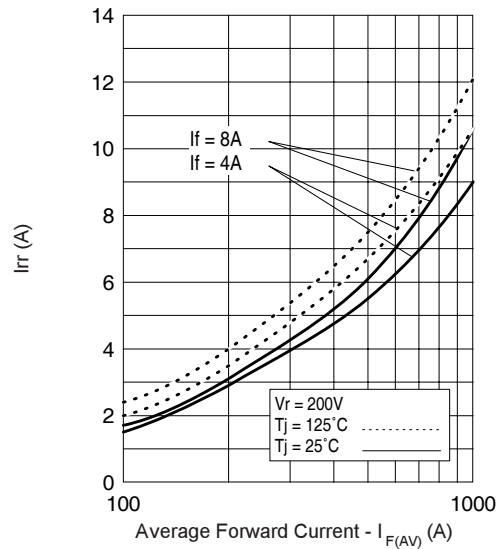


Fig. 6 - Typical Recovery Current vs. di_F/dt

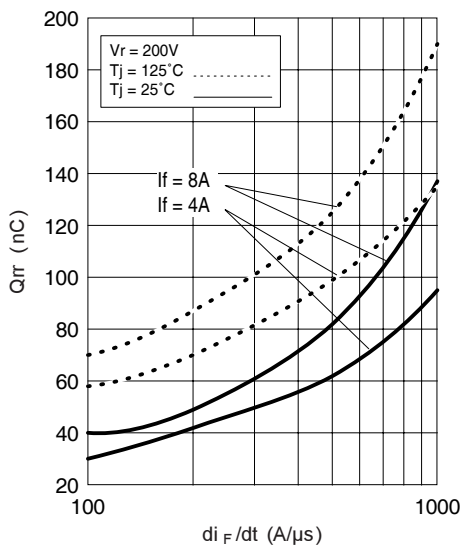


Fig. 7 - Typical Stored Charge vs. di_F/dt

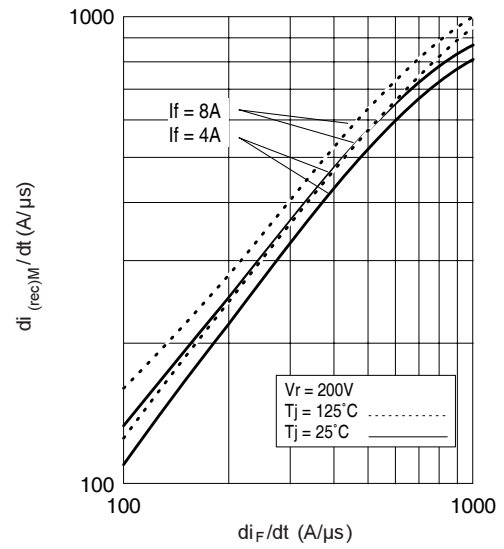


Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_F/dt

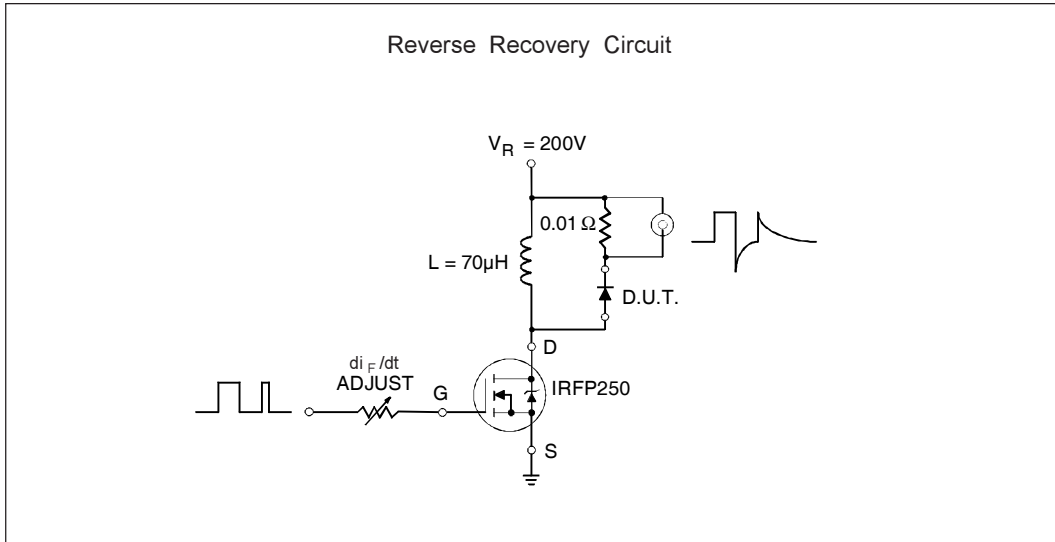


Fig. 9- Reverse Recovery Parameter Test Circuit

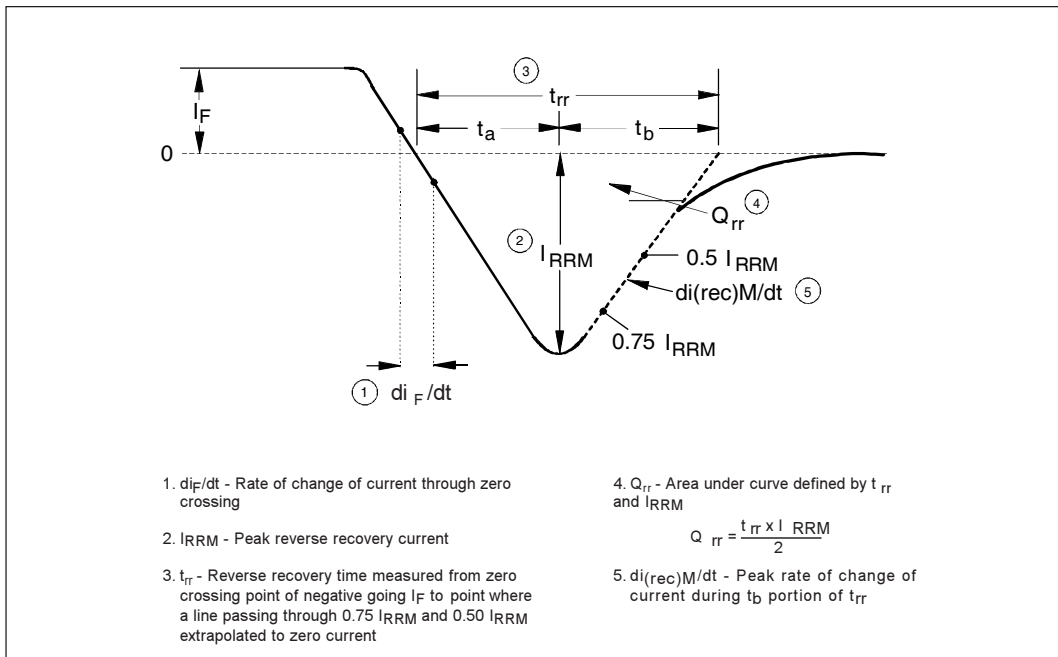
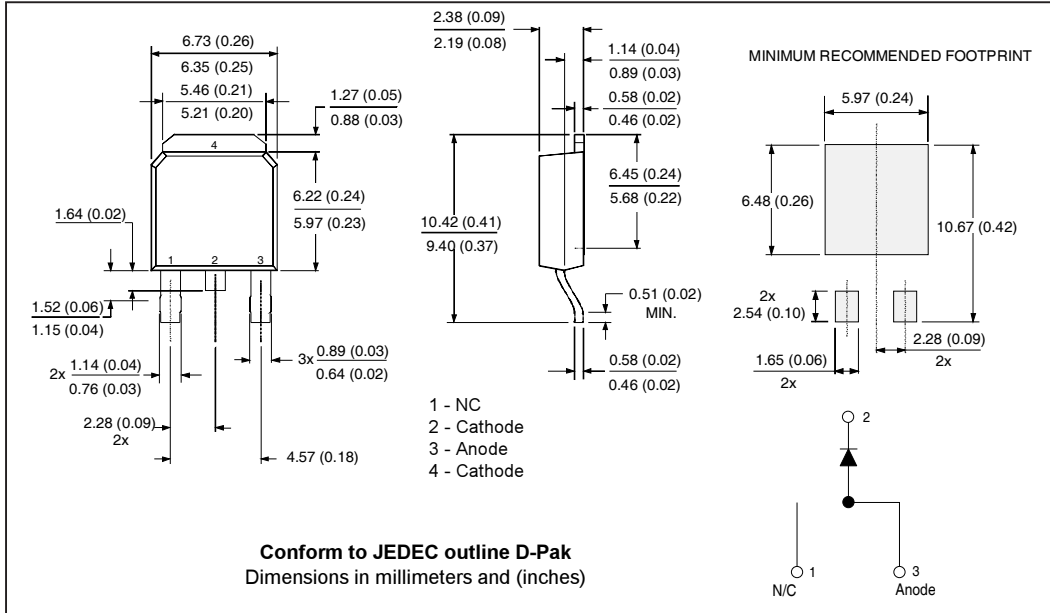
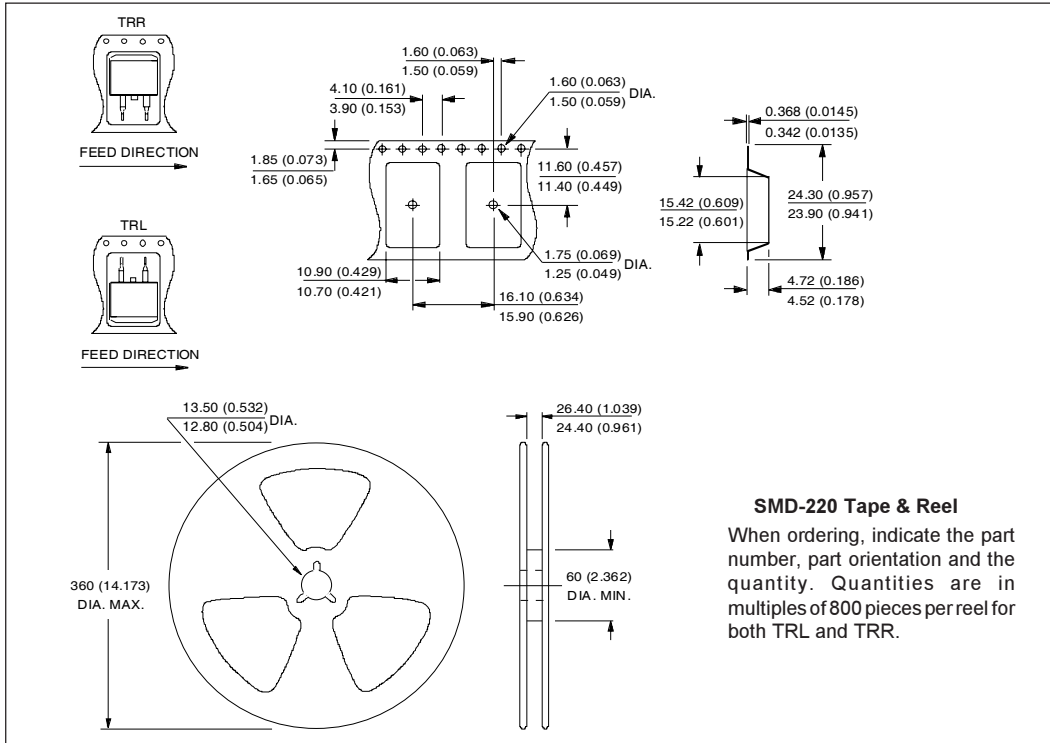


Fig. 10 - Reverse Recovery Waveform and Definitions

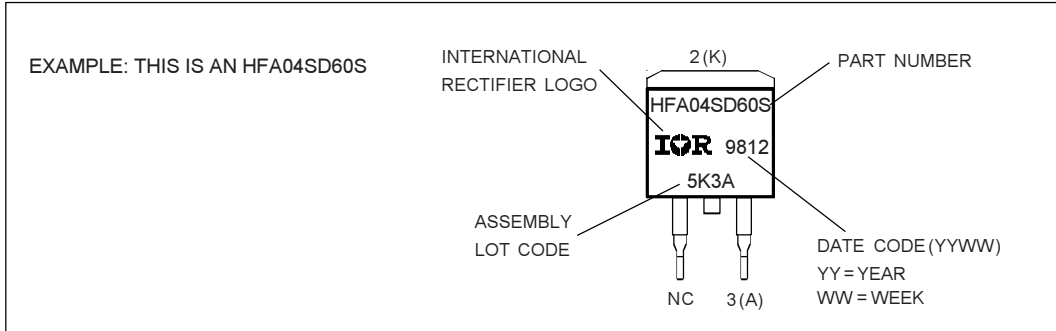
Outline Table



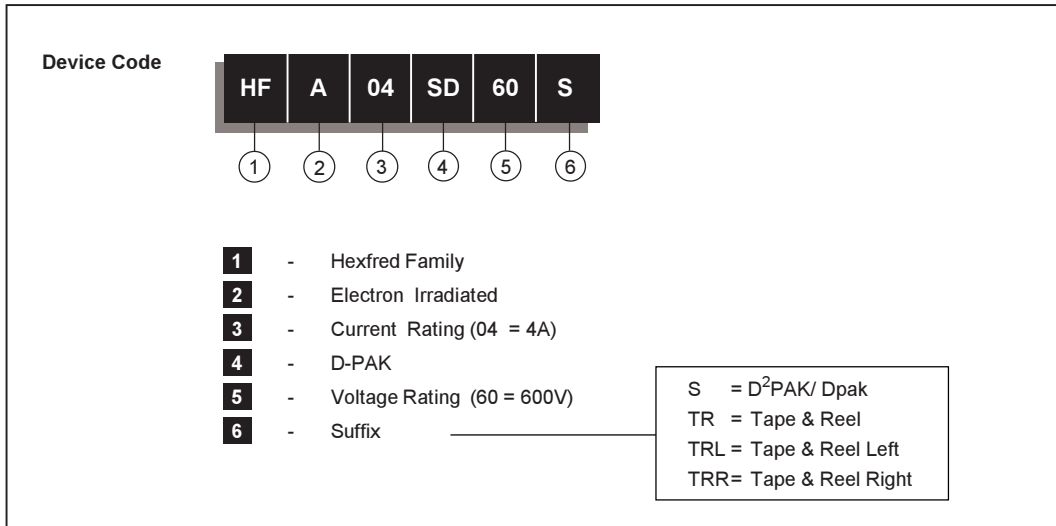
Tape & Reel Information



Marking Information



Ordering Information Table



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.



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