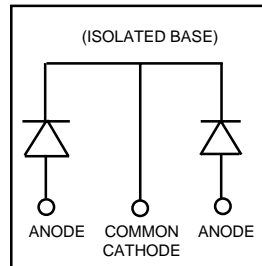


Features

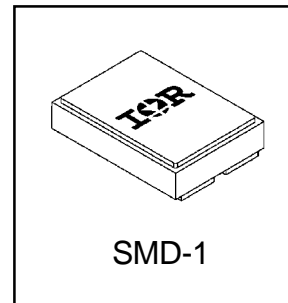
- Reduced RFI and EMI
- Reduced Snubbing
- Extensive Characterization of Recovery Parameters
- Hermetic
- Surface Mount



| |
|------------------------------|
| $V_R = 1200V$ |
| $V_F = 4.46V$ |
| $Q_{rr} = 370nC$ |
| $di_{(rec)}/dt = 380A/\mu s$ |

Description

HEXFRED™ diodes are optimized to reduce losses and EMI/RFI in high frequency power conditioning systems. An extensive characterization of the recovery behavior for different values of current, temperature and di/dt simplifies the calculations of losses in the operating conditions. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for power converters, motors drives and other applications where switching losses are significant portion of the total losses.



Absolute Maximum Ratings (per Leg)

| | Parameter | Max. | Units |
|------------------------------|--------------------------------|-------------|-------|
| V_R | D.C. Reverse Voltage | 1200 | V |
| $I_F @ T_C = 100^\circ C$ | Continuous Forward Current ① | 15 | A |
| $I_{FSM} @ T_C = 25^\circ C$ | Single Pulse Forward Current ② | 130 | |
| $P_D @ T_C = 25^\circ C$ | Maximum Power Dissipation | 63 | W |
| T_J | Operating Junction and | -55 to +150 | °C |
| T_{STG} | Storage Temperature Range | | |

Thermal - Mechanical Characteristics

| | Parameter | Typ. | Max. | Units |
|-----------------|---|------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case, Single Leg Conducting | — | 2.0 | °C/W |
| | Weight | 2.6 | — | g |

Note: ① D.C. = 50% rect. wave

② 1/2 sine wave, 60 Hz, P.W. = 8.33 ms

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HFA40HF120C

International
IR Rectifier

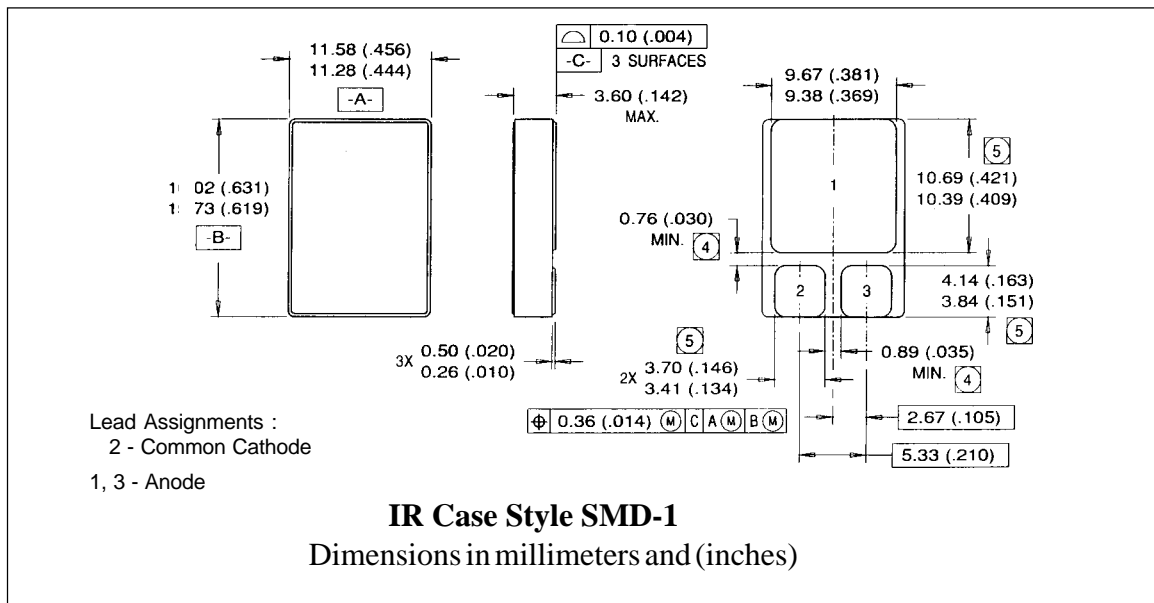
Electrical Characteristics (per Leg) @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|----------|---------------------------------|------|------|------|---------------|---|
| V_{BR} | Cathode Anode Breakdown Voltage | 1200 | — | — | V | $I_R = 250\mu\text{A}$ |
| V_{FM} | Max Forward Voltage | — | — | 3.3 | V | $I_F = 7.0\text{A}$ |
| | | — | — | 4.4 | | $I_F = 15\text{A}$ See Fig. 1 |
| | | — | — | 2.8 | | $I_F = 7.0\text{A}, T_J = 125^\circ\text{C}$ |
| I_{RM} | Max Reverse Leakage Current | — | — | 10 | μA | $V_R = V_R$ Rated See Fig. 2 |
| | | — | — | 1.0 | mA | $T_J = 125^\circ\text{C}, V_R = 480\text{V}$ |
| C_T | Junction Capacitance | — | 10 | 15 | pF | $V_R = 200\text{V}$ See Fig. 3 |
| L_S | Series Inductance | — | 2.8 | — | nH | Measured from center of bond pad to end of anode bonding wire |

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

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|-------------------|---------------------------------------|-----------------------------|------|------|------------------------|-------------------------------------|
| t_{rr1} | Reverse Recovery Time | — | 58 | 100 | ns | $T_J = 25^\circ\text{C}$ See Fig. 5 |
| t_{rr2} | | $T_J = 125^\circ\text{C}$ 5 | | | | |
| I_{RRM1} | Peak Recovery Current | — | 5.4 | 8.1 | A | $T_J = 25^\circ\text{C}$ See Fig. 6 |
| I_{RRM2} | | $T_J = 125^\circ\text{C}$ 6 | | | | |
| Q_{rr1} | Reverse Recovery Charge | — | 185 | 370 | nC | $T_J = 25^\circ\text{C}$ See Fig. 7 |
| Q_{rr2} | | $T_J = 125^\circ\text{C}$ 7 | | | | |
| $di_{(rec)M}/dt1$ | Peak Rate of Fall of Recovery Current | — | 255 | 380 | $\text{A}/\mu\text{s}$ | $T_J = 25^\circ\text{C}$ See Fig. 8 |
| $di_{(rec)M}/dt2$ | | During t_b | — | 160 | | 240 |

Case Outline and Dimensions — SMD-1



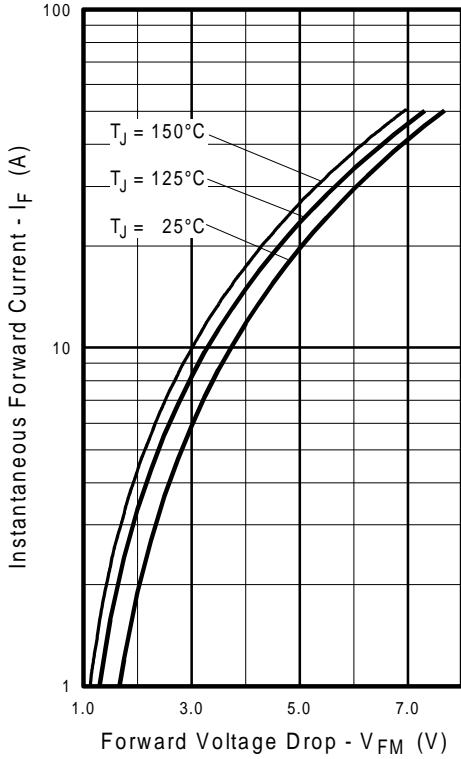


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

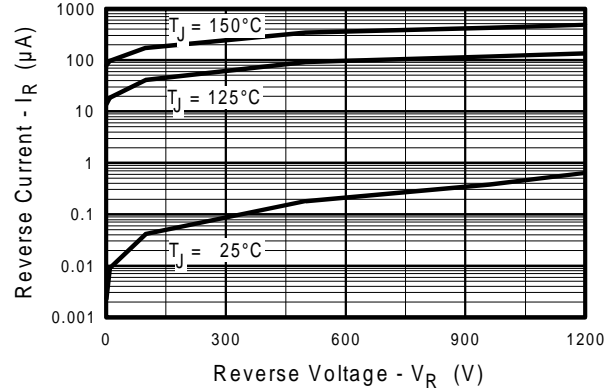


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

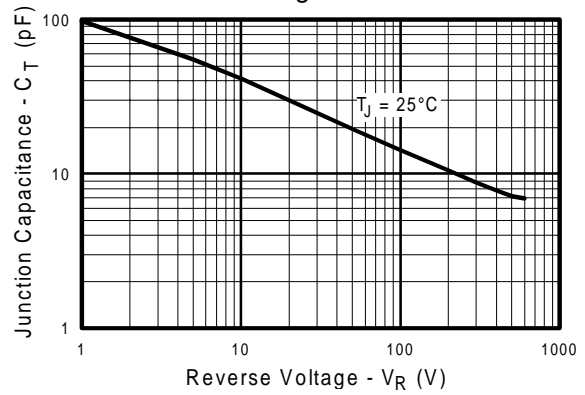


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

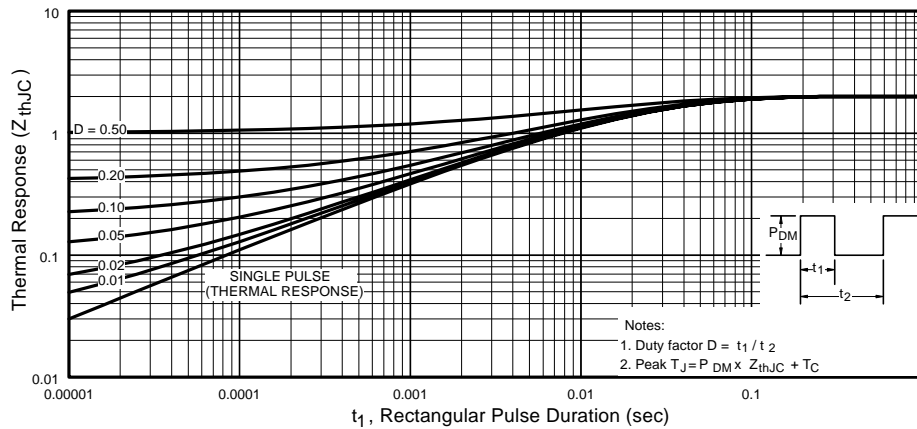


Fig. 4 - Maximum Thermal Impedance Z_{thjc} Characteristics

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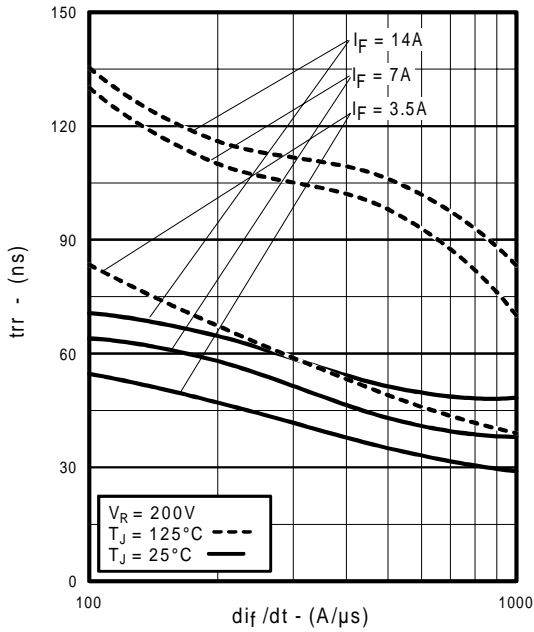


Fig. 5 - Typical Reverse Recovery vs. di_f/dt

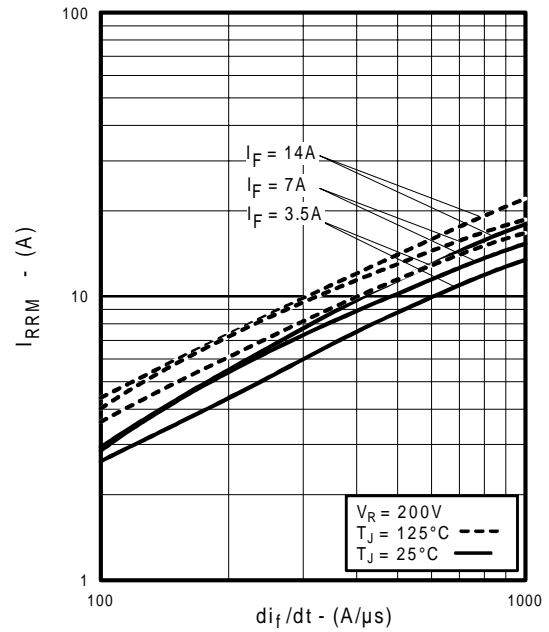


Fig. 6 - Typical Recovery Current vs. di_f/dt

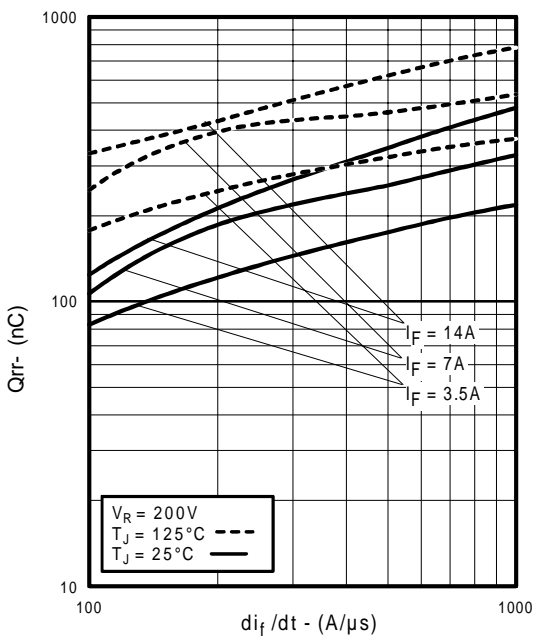


Fig. 7 - Typical Stored Charge vs. di_f/dt

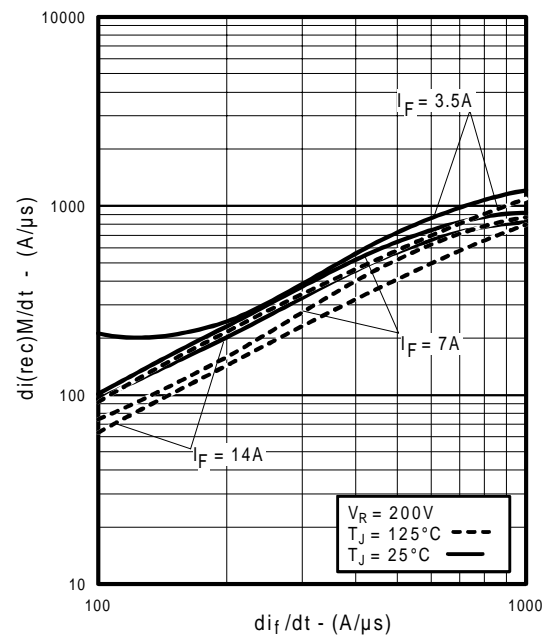


Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_f/dt

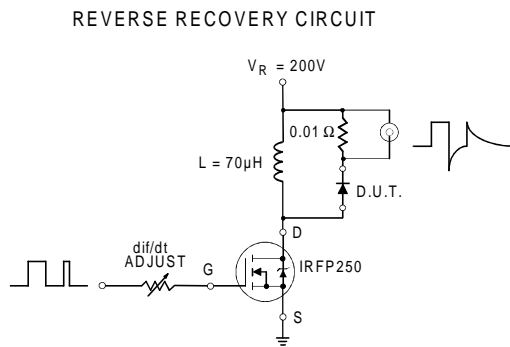


Fig. 9 - Reverse Recovery Parameter Test Circuit

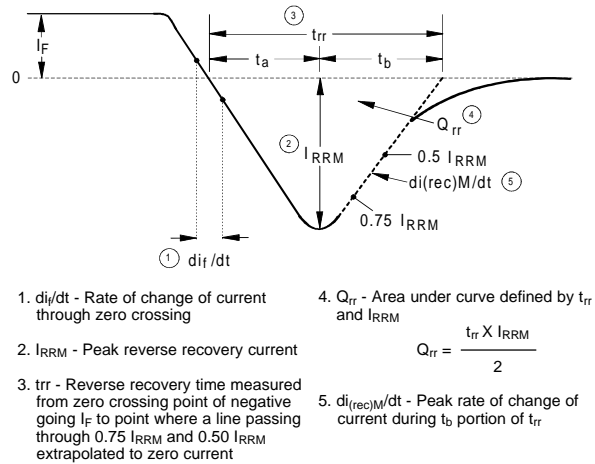


Fig. 10 - Reverse Recovery Waveform and Definitions