PD - 94324A

International
IOR Rectifier

HFB50HI20

FRED

Ultrafast, Soft Recovery Diode

Features

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

V_R = 200V

$I_{F(AV)}$ = 50A

t_{rr} = 35ns

Description

These Ultrafast, soft recovery 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.

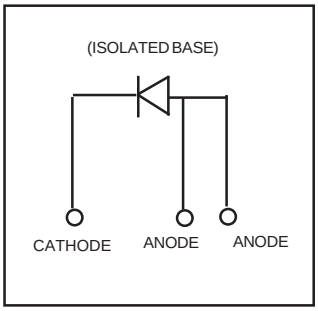
Absolute Maximum Ratings

	Parameter	Max.	Units
V_R	Cathode to Anode Voltage	200	V
$I_{F(AV)}$	Continuous Forward Current, ① T_C = 87°C	50	A
I_{FSM}	Single Pulse Forward Current, ② T_C = 25°C	450	
P_D @ T_C = 25°C	Maximum Power Dissipation	167	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

Note: ① D.C. = 50% rect. wave
② 1/2 sine wave, 60 Hz , P.W. = 8.33 ms

CASE STYLE

TO-259AA



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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V_{BR}	Cathode Anode Breakdown Voltage	200	—	—	V	I_R = 100µA
V_F	Forward Voltage	—	—	1.34	V	I_F = 50A, T_J = -55°C ④
	See Fig. 1 ③	—	—	1.28		I_F = 50A, T_J = 25°C ④
		—	—	1.7		I_F = 100A, T_J = 25°C ④
		—	—	1.69		I_F = 100A, T_J = 125°C ④
I_R	Reverse Leakage Current	—	—	10	µA	V_R = V_R Rated
	See Fig. 2 ③	—	—	100	µA	V_R = V_R Rated, T_J = 125°C
C_T	Junction Capacitance, See Fig. 3	—	—	330	pF	V_R = 200V
L_S	Series Inductance	—	8.7	—	nH	Measured from anode lead to cathode lead, 6 mm (0.025 in) from package

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions		
t_{rr}	Reverse Recovery Time	—	—	35	ns	I_F = 0.5A, V_R = 30V, di_f/dt = 300A/µs		
t_{rr1}	Reverse Recovery Time	—	42	—	ns	T_J = 25°C	See Fig.	I_F = 50A
t_{rr2}		—	69	—		T_J = 125°C	5	
I_{RRM1}	Peak Recovery Current	—	4.4	—	A	T_J = 25°C	See Fig.	
I_{RRM2}		—	8.7	—		T_J = 125°C	6	V_R = 160V
Q_{rr1}	Reverse Recovery Charge	—	108	—	nC	T_J = 25°C	See Fig.	
Q_{rr2}		—	314	—		T_J = 125°C	7	di_f/dt = 200A/µs
$di_{(rec)M}/dt1$	Peak Rate of Fall of Recovery Current	—	390	—	A/µs	T_J = 25°C	See Fig.	
$di_{(rec)M}/dt2$	During t_b	—	570	—		T_J = 125°C	8	

Thermal - Mechanical Characteristics

	Parameter	Typ.	Max.	Units
R_{thJC}	Junction-to-Case	—	0.75	°C/W
Wt	Weight	10.9	—	g

Note:

③ Pulse Width < 300µs, Duty Cycle < 2%

④ Pins 2 and 3 externally tied together

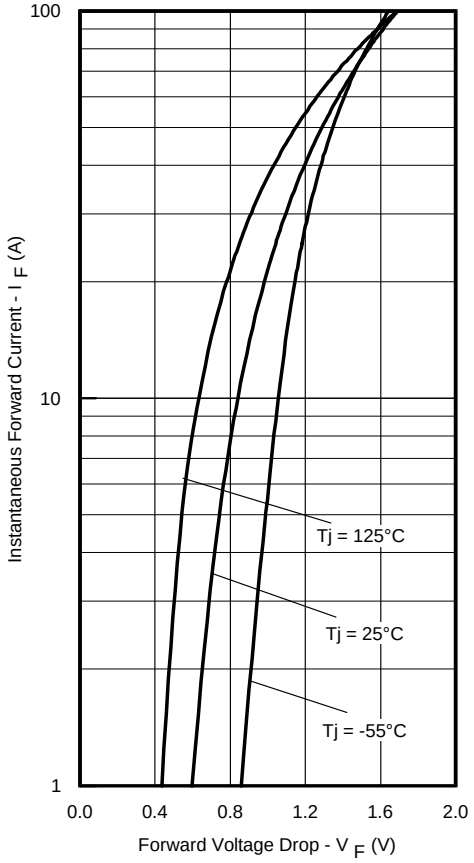


Fig. 1 - Maximum Forward Voltage Drop Vs. Instantaneous Forward Current

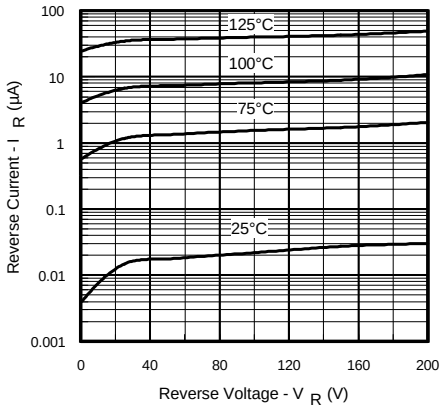


Fig. 2 - Typical Reverse Current Vs. Reverse Voltage

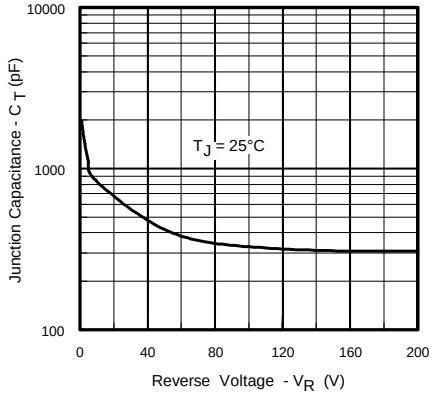


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

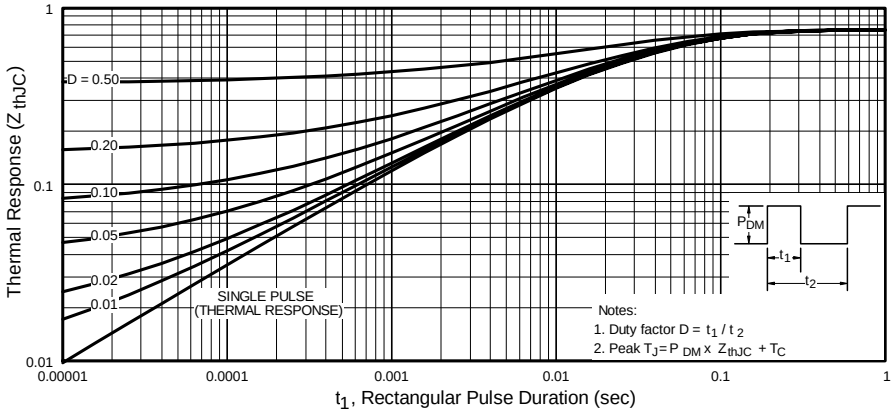


Fig. 4 - Maximum Thermal Impedance Z_{thjc} Characteristics

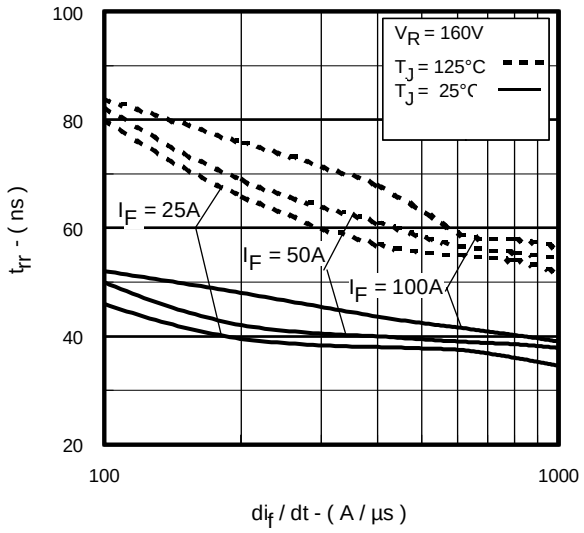


Fig. 5 - Typical Reverse Recovery Vs. di_f/dt,

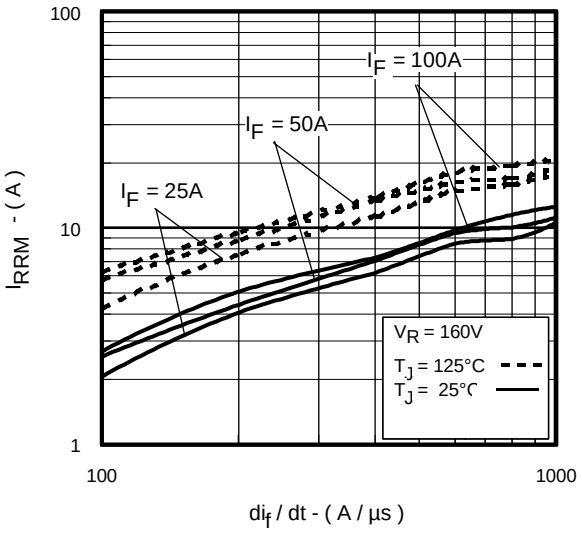


Fig. 6 - Typical Recovery Current Vs. di_f/dt,

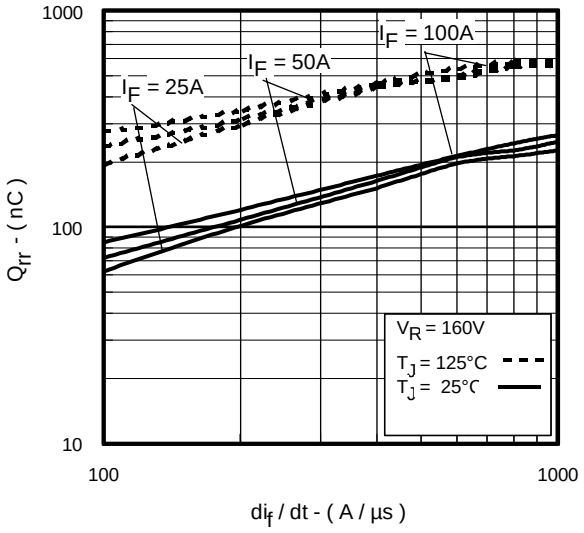


Fig. 7 - Typical Stored Charge Vs. di_f/dt

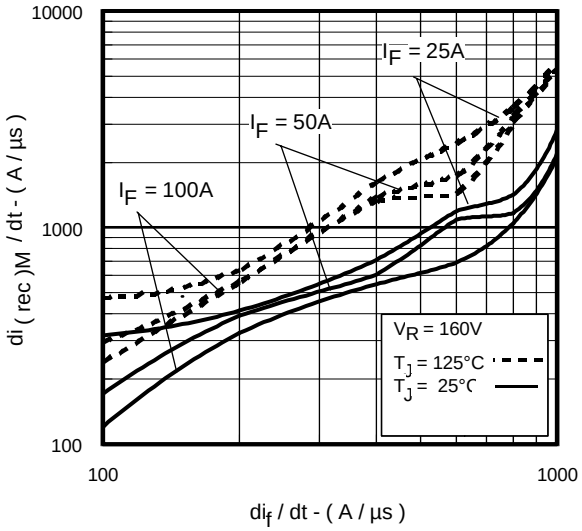


Fig. 8 - Typical $di_{(rec)M}/dt$ Vs. di_f/dt

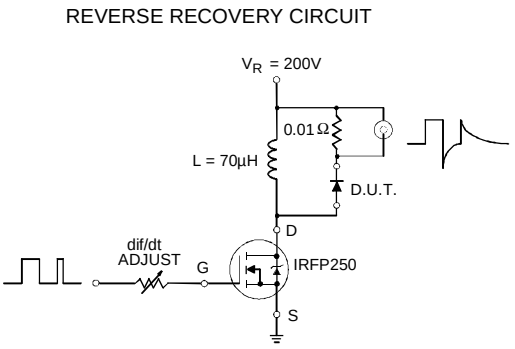


Fig. 9 - Reverse Recovery Parameter Test Circuit

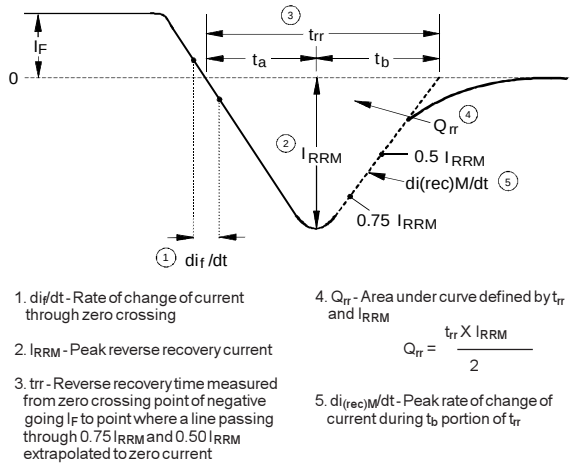
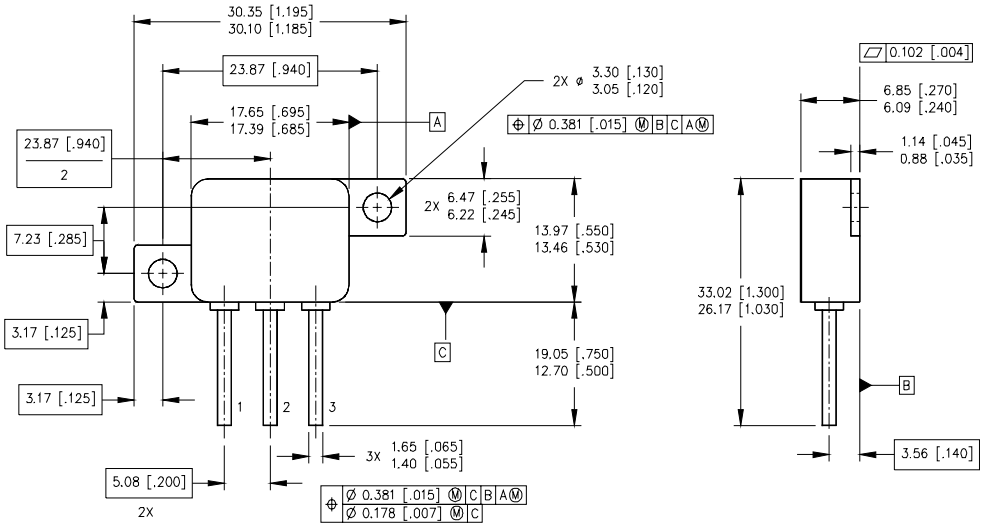


Fig. 10 - Reverse Recovery Waveform and Definitions

Case Outline and Dimensions — TO-259AA



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME 14.5M–1994.
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. CONTROLLING DIMENSION: INCH
4. CONFORMS TO JEDEC OUTLINE TO-259AA.

PIN ASSIGNMENTS

1 = CATHODE
2 = ANODE
3 = ANODE

International
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>>Infineon Technologies(英飞凌)