PD -2.445A

International
IOR Rectifier

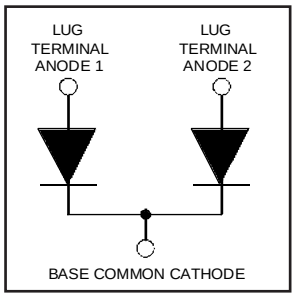
HFA280NJ60C

HEXFRED™

Ultrafast, Soft Recovery Diode

Features

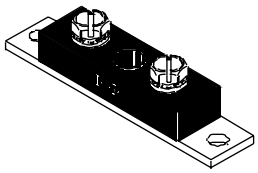
- Reduced RFI and EMI
- Reduced Snubbing
- Extensive Characterization of Recovery Parameters



V_R = 600V
V_F(typ.)③ = 1.3V
$I_{F(AV)}$ = 280A
Q_{rr} (typ.) = 490nC
I_{RRM}(typ.) = 9.3A
t_{rr}(typ.) = 39ns
$di_{(rec)M}/dt$ (typ.)③ = 200A/µs

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.



T0-244AB

Absolute Maximum Ratings (per Leg)

	Parameter	Max.	Units
V_R	Cathode-to-Anode Voltage	600	V
I_F @ T_C = 25°C	Continuous Forward Current	222	A
I_F @ T_C = 100°C	Continuous Forward Current	111	
I_{FSM}	Single Pulse Forward Current ①	800	
I_{AS}	Maximum Single Pulse Avalanche Current ②	2.0	
E_{AS}	Non-Repetitive Avalanche Energy ②	220	µJ
P_D @ T_C = 25°C	Maximum Power Dissipation	625	W
P_D @ T_C = 100°C	Maximum Power Dissipation	250	
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	C

Thermal - Mechanical Characteristics

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case, Single Leg Conducting	–––	–––	0.20	°C/W K/W
	Junction-to-Case, Both Legs Conducting	–––	–––	0.10	
$R_{\theta CS}$	Case-to-Sink, Flat , Greased Surface	–––	0.10	–––	
Wt	Weight	–––	79 (2.8)	–––	g (oz)
	Mounting Torque	35 (4.0)	–––	50 (5.7)	lbf•in (N•m)
	Mounting Torque Center Hole	–––	15 (1.7)	–––	
	Terminal Torque	50 (5.7)	–––	75 (8.5)	

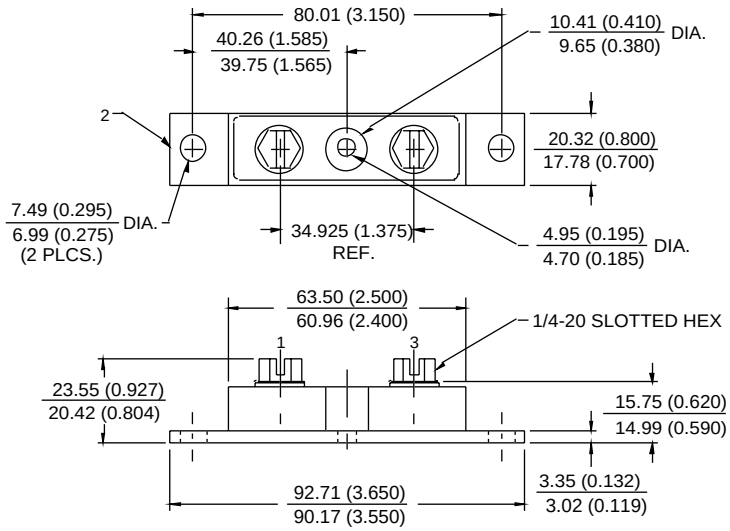
Note: ① Limited by junction temperature
② L = 100µH, duty cycle limited by max T_J
③ 125°C

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions	
V_{BR}	Cathode Anode Breakdown Voltage	600	–––	–––	V	I_R = 100µA	
V_{FM}	Max Forward Voltage	–––	1.4	1.6	V	I_F = 140A	See Fig. 1
		–––	1.6	1.8		I_F = 280A	
		–––	1.3	1.5		I_F = 140A, T_J = 125°C	
I_{RM}	Max Reverse Leakage Current	–––	8.0	40	µA	V_R = V_R Rated	See Fig. 2
		–––	2.0	8.0	mA	T_J = 125°C, V_R = 480V	
C_T	Junction Capacitance	–––	280	400	pF	V_R = 200V	See Fig. 3
L_S	Series Inductance	–––	5.0	–––	nH	From top of terminal hole to mounting plane	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions	
t_{rr}	Reverse Recovery Time	–––	39	–––	ns	I_F = 1.0A, di_f/dt = 200A/µs, V_R = 30V	
t_{rr1}		–––	92	140		T_J = 25°C	I_F = 140A
t_{rr2}		–––	180	270		T_J = 125°C	
I_{RRM1}	Peak Recovery Current	–––	9.3	17	A	T_J = 25°C	V_R = 200V
I_{RRM2}		–––	16	30		T_J = 125°C	
Q_{rr1}	Reverse Recovery Charge	–––	490	1200	nC	T_J = 25°C	
Q_{rr2}		–––	1400	4000		T_J = 125°C	di_f/dt = 200A/µs
$di_{(rec)M}/dt1$	Peak Rate of Fall of Recovery Current	–––	290	–––	A/µs	T_J = 25°C	
$di_{(rec)M}/dt2$	During t_b	–––	200	–––		T_J = 125°C	



LEAD ASSIGNMENTS
1 - ANODE
2 - CATHODE
3 - ANODE

CONFORMS TO JEDEC OUTLINE TO-244AB

Dimensions in Millimeters and (Inches)

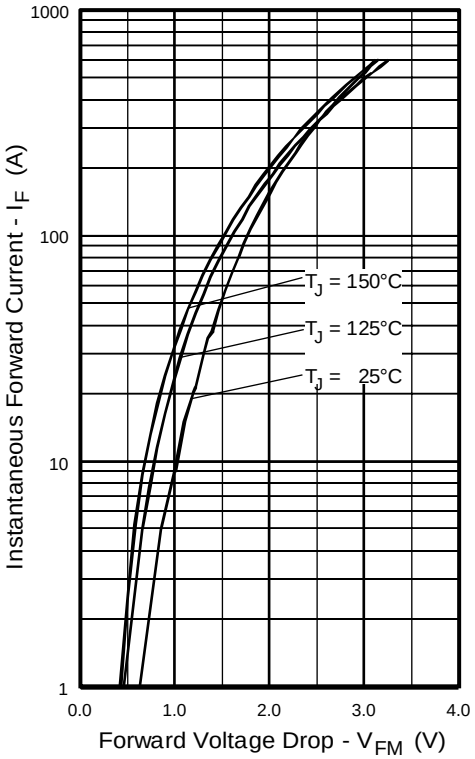


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current, (per Leg)

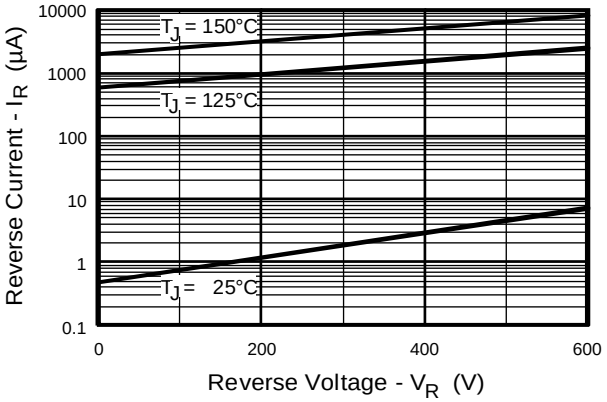


Fig. 2 - Typical Reverse Current vs. Reverse Voltage, (per Leg)

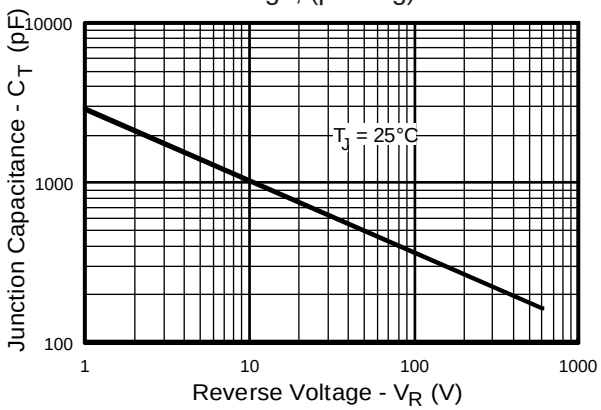


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage, (per Leg)

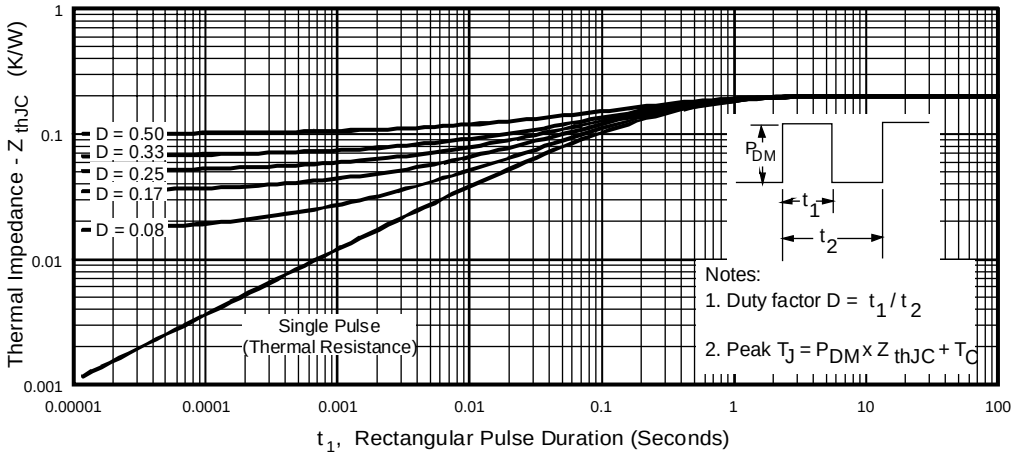


Fig. 4 - Maximum Thermal Impedance Z_{thjc} Characteristics, (per Leg)

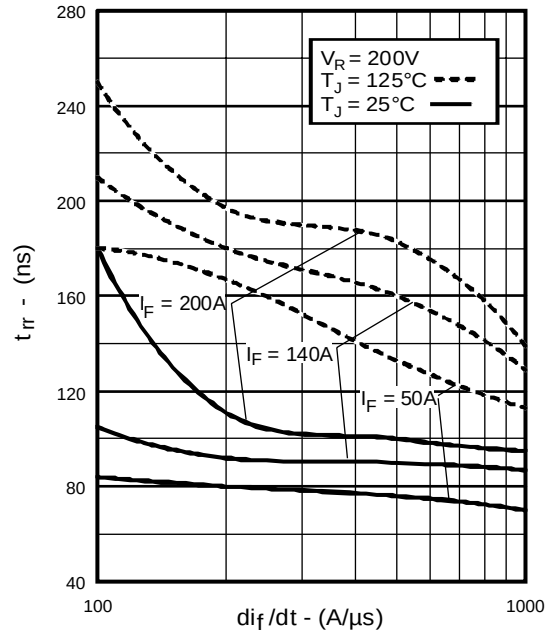


Fig. 5 - Typical Reverse Recovery vs. di_f/dt, (per Leg)

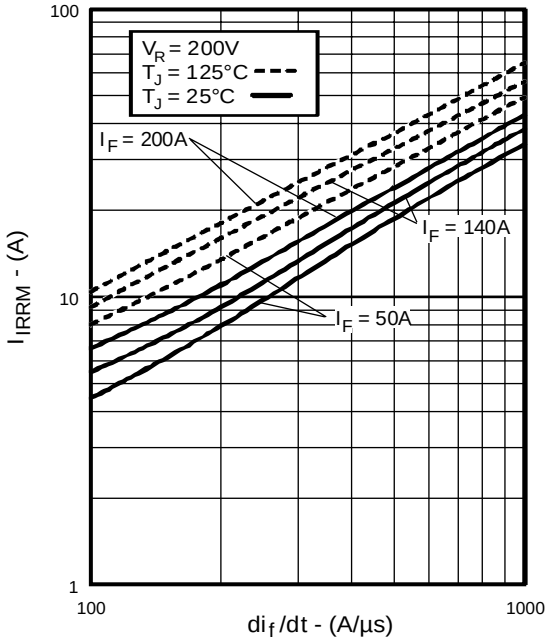


Fig. 6 - Typical Recovery Current vs. di_f/dt, (per Leg)

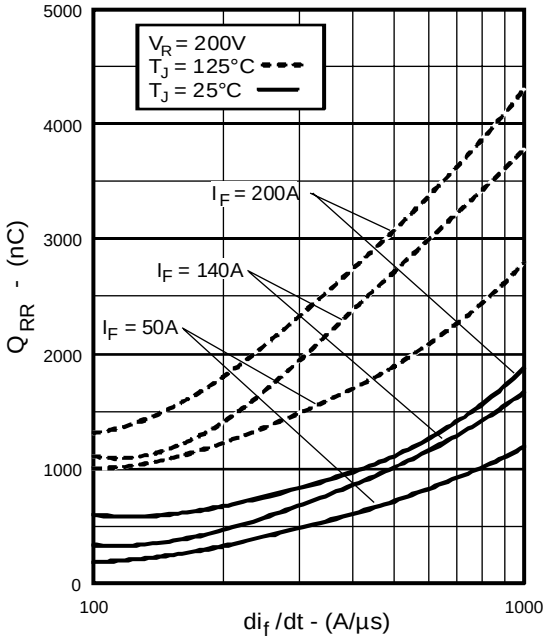


Fig. 7 - Typical Stored Charge vs. di_f/dt, (per Leg)

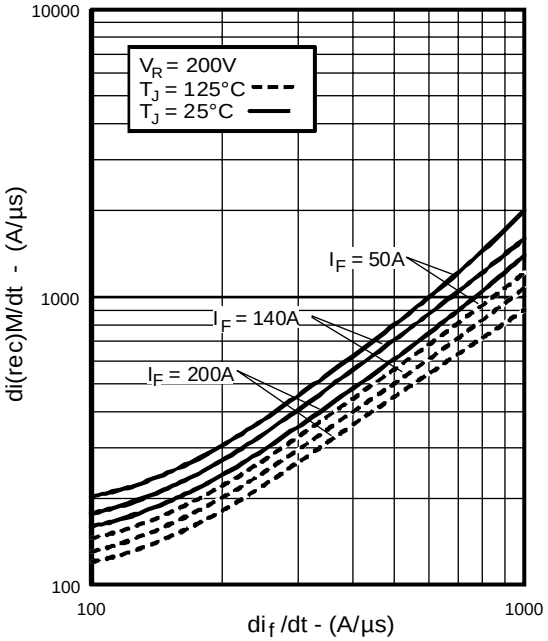


Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_f/dt, (per Leg)

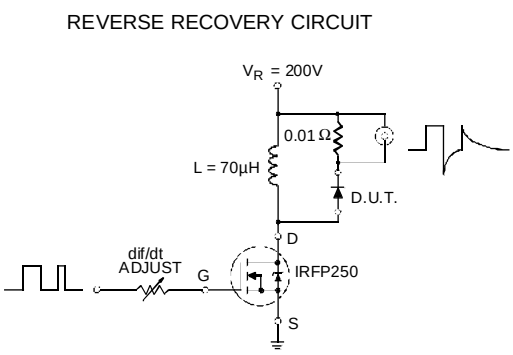


Fig. 9 - Reverse Recovery Parameter Test Circuit

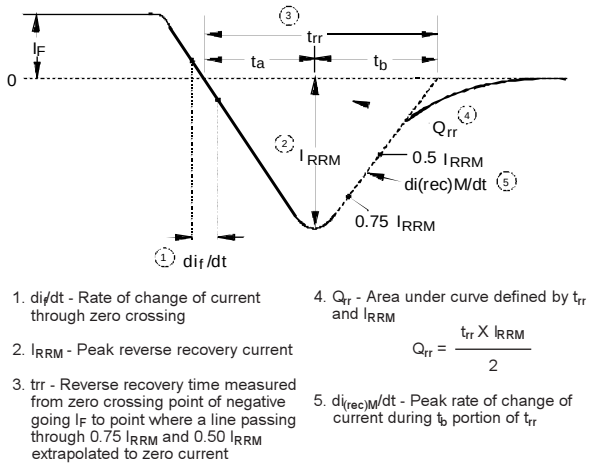


Fig. 10 - Reverse Recovery Waveform and Definitions

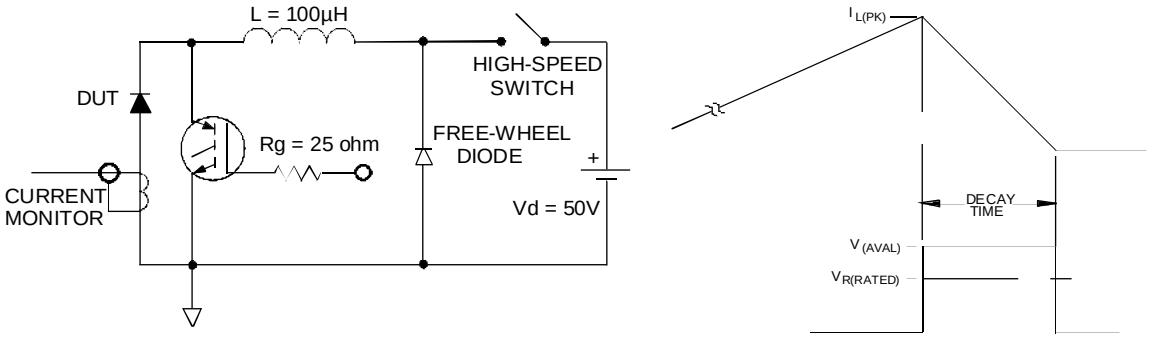


Fig. 11 - Avalanche Test Circuit and Waveforms

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