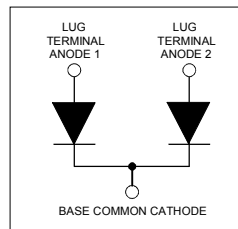


Features

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



$V_R = 400V$
$V_F(\text{typ.})^{\text{③}} = 1V$
$I_{F(AV)} = 240A$
$Q_{rr}(\text{typ.}) = 290nC$
$I_{RRM}(\text{typ.}) = 7.5A$
$t_{rr}(\text{typ.}) = 50ns$
$di_{(rec)}/dt(\text{typ.})^{\text{③}} = 270A/\mu s$

Description/Applications

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

	Parameters	Max	Units
V_R	Cathode-to-Anode Voltage	400	V
$I_F @ T_C = 25^\circ C$	Continuous Forward Current	244	A
$I_F @ T_C = 100^\circ C$	Continuous Forward Current	122	
I_{FSM}	Single Pulse Forward Current ①	900	
E_{AS}	Non-Repetitive Avalanche Energy ②	1.4	mJ
$P_D @ T_C = 25^\circ C$	Maximum Power Dissipation	460	W
$P_D @ T_C = 100^\circ C$	Maximum Power Dissipation	185	
T_J, T_{STG}	Operating Junction and Storage Temperature Range	- 55 to 150	°C

Case Styles

S1241



TO-244

- ① Limited by junction temperature
 ② $L = 100\mu H$, duty cycle limited by max T_J
 ③ $125^\circ C$

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

Parameters		Min	Typ	Max	Units	Test Conditions
V _{BR}	Cathode Anode Breakdown Voltage,	400	-	-	V	I _R = 100μA
V _{FM}	Max. Forward Voltage	-	1.1	1.3	V	I _F = 120A
		-	1.3	1.5	V	I _F = 240A
		-	1.0	1.2	V	I _F = 120A, T _J = 125°C
I _{RM}	Max. Reverse Leakage Current	-	1.5	9	μA	V _R = V _R Rated
		-	2.3	12	mA	T _J = 125°C, V _R = 320V
C _T	Junction Capacitance	-	280	380	pF	V _R = 200V
L _S	Series Inductance	-	6.0	-	nH	From top of terminal hole to mounting plane

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

Parameters		Min	Typ	Max	Units	Test Conditions
t _{rr}	Reverse Recovery Time	-	50	-	ns	I _F = 1.0A, di _F /dt = 200A/μs, V _R = 30V
t _{rr1}		-	77	120		T _J = 25°C
t _{rr2}		-	290	440		T _J = 125°C
I _{RRM1}		Peak Recovery Current	-	7.5		14
I _{RRM2}		-	16	30		T _J = 125°C
Q _{rr1}	Reverse Recovery Charge	-	290	780	nC	T _J = 25°C
Q _{rr2}		-	2300	6300		T _J = 125°C
di _{(rec)M} /dt1		-	320	-	A/μs	T _J = 25°C
di _{(rec)M} /dt2		-	270	-		T _J = 25°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	
R _{thJC}	Thermal Resistance, Junction to Case	Per Leg		0.27	°C/W
	Thermal Resistance, Junction to Case	Per Module		0.14	K/W
R _{thCS}	Thermal Resistance, Case to Heatsink	-	0.10	-	
Wt	Weight	-	68 (2.4)	-	g (oz)
	Mounting Torque (*)	30 (3.4)	-	40 (4.6)	lbf.in
	Mounting Torque Center Hole	12 (1.4)	-	18 (2.1)	(N.m)
	Terminal Torque	30 (3.4)	-	40 (4.6)	
	Vertical Pull	-	-	80	lbf.in
	2 inch Lever Pull	-	-	35	

(*) Mounting surface must be smooth, flat, free of burrs or other protrusions. Apply a thin even film of thermal grease to mounting surface. Gradually tighten each mounting bolt in 5-10lbf.in steps until desired or maximum torque limits are reached

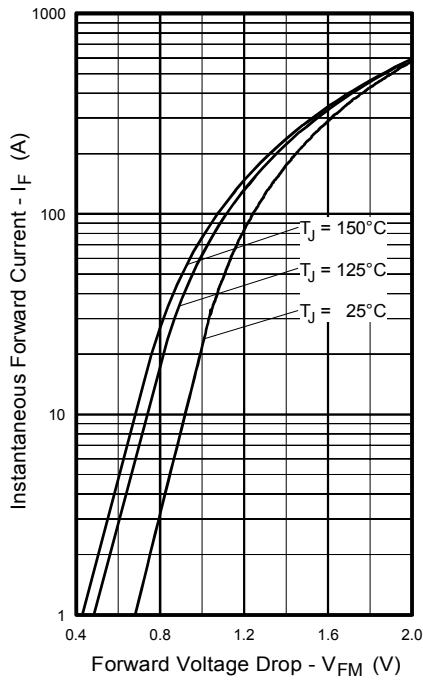


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current (per Leg)

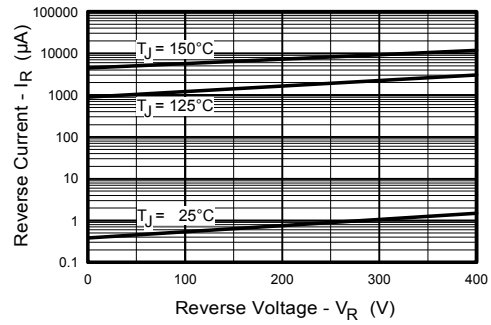


Fig. 2 - Typical Reverse Current vs. Reverse Voltage, (per Leg)

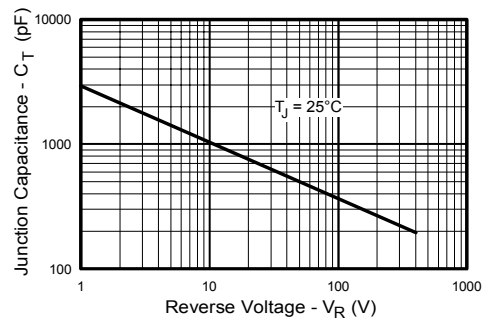


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage, (per Leg)

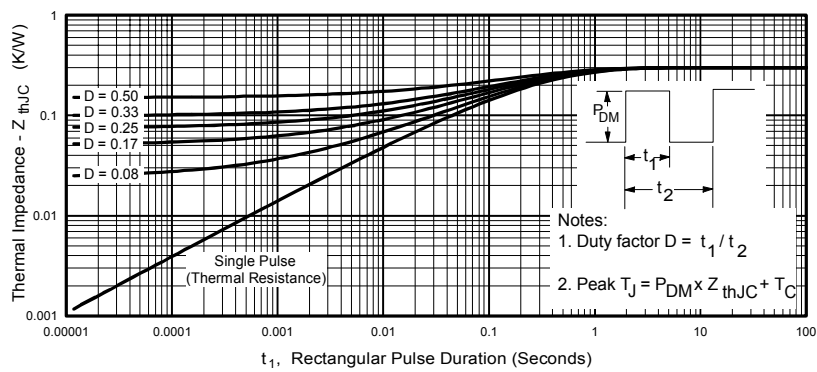


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics, (per Leg)

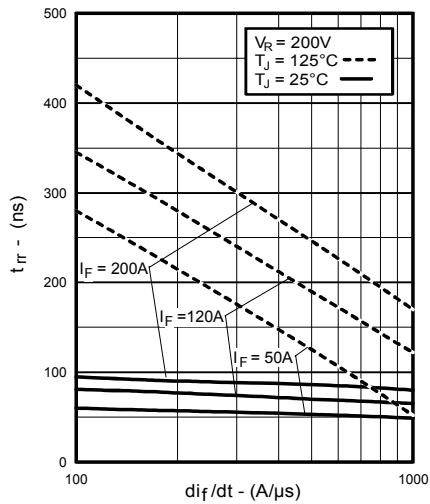


Fig. 5 - Typical Reverse Recovery vs. di_f/dt , (per Leg)

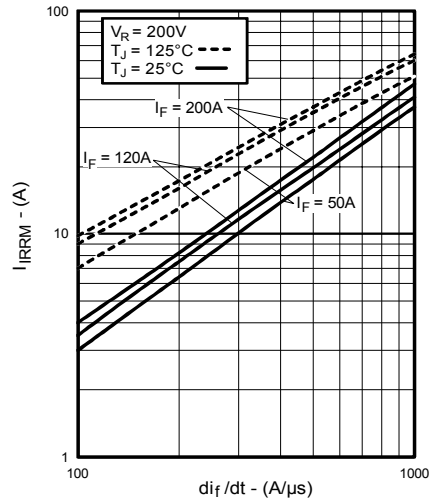


Fig. 6 - Typical Recovery Current vs. di_f/dt , (per Leg)

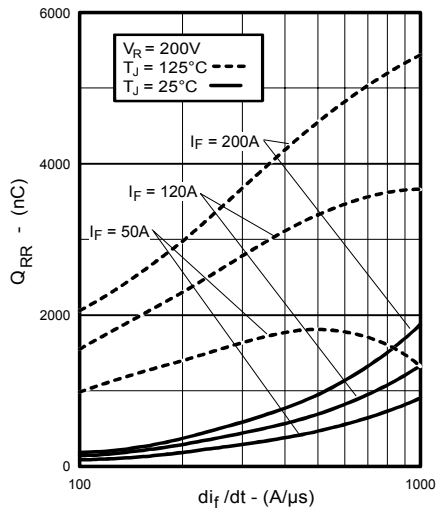


Fig. 7 - Typical Stored Charge vs. di_f/dt , (per Leg)

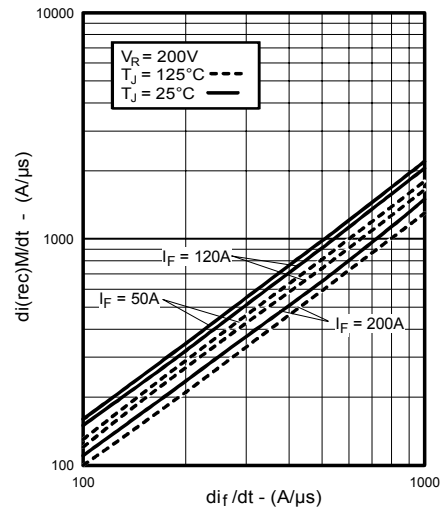


Fig. 8 - Typical $di_{(rec)M}/dt$ vs. di_f/dt , (per Leg)

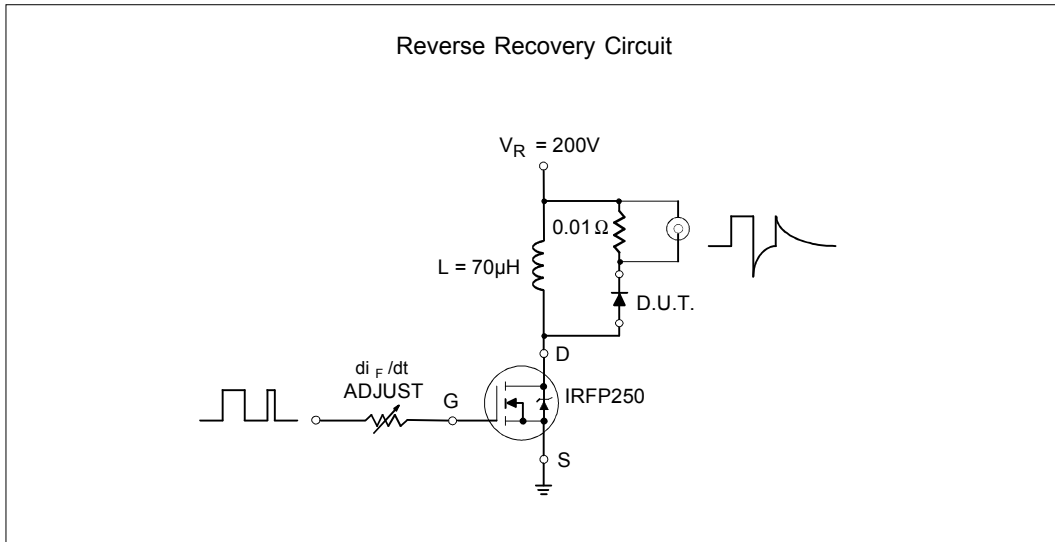


Fig. 9- Reverse Recovery Parameter Test Circuit

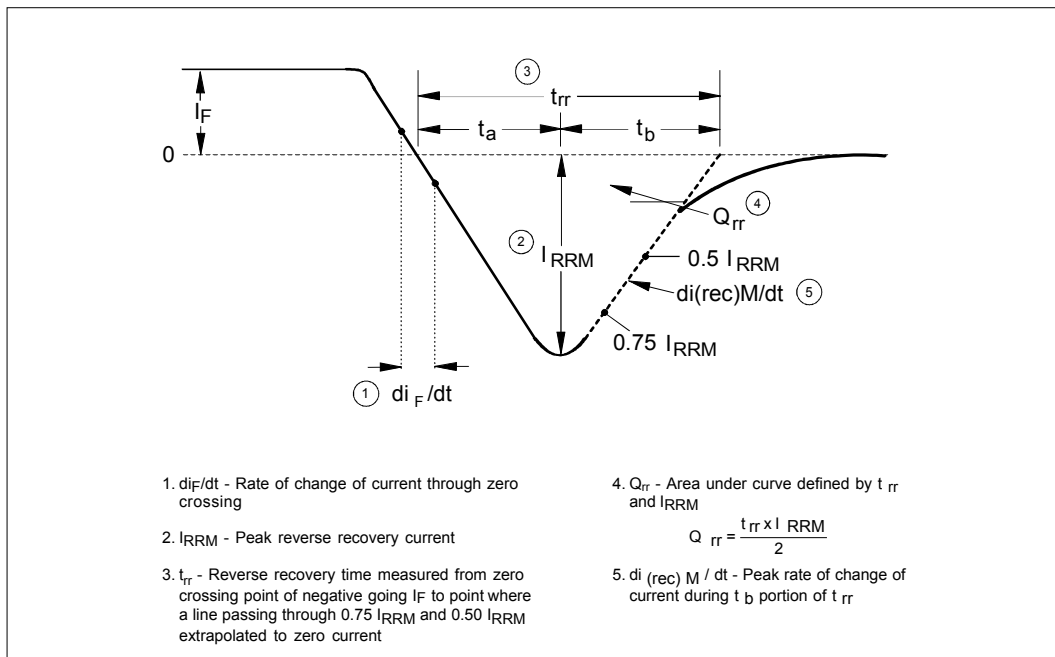
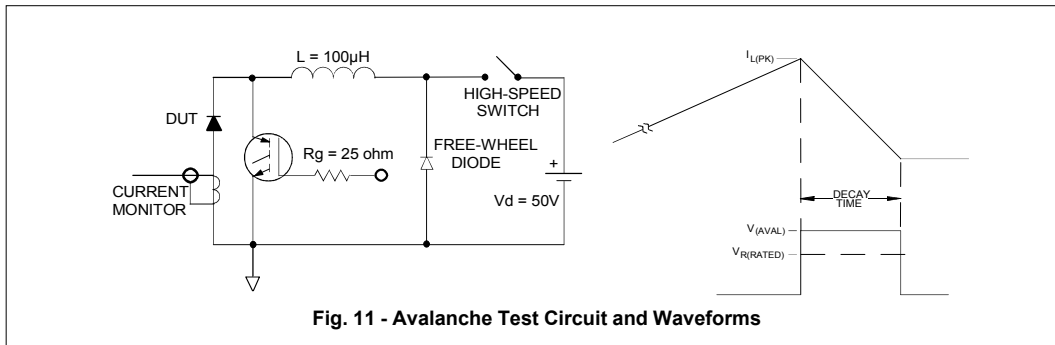
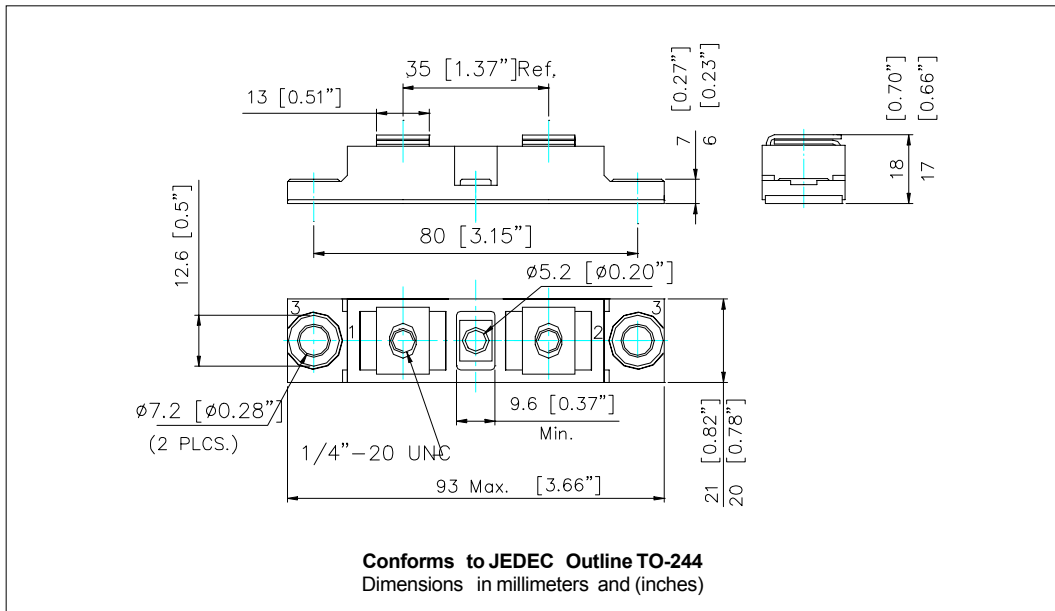


Fig. 10 - Reverse Recovery Waveform and Definitions



Outline 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.