

Bulletin PD-21047 05/05

International
IOR Rectifier

IRUD400CW60

FRED™

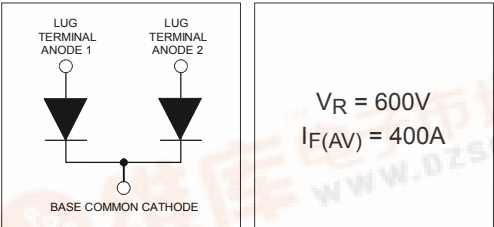
Ultrafast, Soft Recovery Diode

Features

- Ultrafast Recovery
- Lead-Free

Benefits

- Reduced RFI and EMI
- 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 HF welding, power converters 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		600	V
I _{F(AV)}	Continuous Forward Current	@ T _C = 25°C	330	A
		@ T _C = 85°C	230	
		@ T _C = 97°C	200	
I _{FSM}	Single Pulse Forward Current		1200	
P _D	Maximum Power Dissipation	@ T _C = 25°C	660	W
		@ T _C = 97°C	280	

Case Styles

IRUD400CW60



TO-244

(*) Per Leg unless otherwise specified



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

Parameters	Min	Typ	Max	Units	Test Conditions
V_{BR} Breakdown Voltage,	600	-	-	V	$I_R = 100\mu\text{A}$
V_{FM} Forward Voltage	-	1.45	2.0		$I_F = 200\text{A}$
	-	1.67	2.3		$I_F = 400\text{A}$
	-	1.13	1.4		$I_F = 200\text{A} @ T_J = 150^\circ\text{C}$
	-	1.39	1.8		$I_F = 400\text{A} @ T_J = 150^\circ\text{C}$
I_{RM} Reverse Leakage Current	-	0.3	1.38	mA	$T_J = 150^\circ\text{C}$, $V_R = V_R \text{ Rated}$
L_S Series Inductance	-	5	-	nH	from top of terminal hole to mounting plane

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

Parameters	Min	Typ	Max	Units	Test Conditions
t_{rr} Reverse Recovery Time	-	90	-	ns	$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V}$
	-	240	-		$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V} @ T_J = 150^\circ\text{C}$
I_{RRM} Peak Recovery Current	-	8.3	-	A	$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V}$
	-	24	-		$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V} @ T_J = 150^\circ\text{C}$
Q_{rr} Reverse Recovery Charge	-	830	-	nC	$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V}$
	-	4730	-		$I_f = 200\text{A}$, $\text{dif}/\text{dt} = 200\text{A}/\mu\text{s}$, $V_r = 200\text{V} @ T_J = 150^\circ\text{C}$

Thermal - Mechanical Characteristics

Parameters			Min	Typ	Max	Units
T _J	Max. Junction Temperature Range		- 40	-	150	°C
T _{Stg}	Max. Storage Temperature Range		- 40	-	150	
R _{thJC}	Thermal Resistance, Junction to Case	Per Leg	-	-	0.19	°C/W
	Thermal Resistance, Junction to Case	Per Module	-	-	0.095	
R _{thCS}	Thermal Resistance, Case to Heatsink		-	0.10	-	
Wt	Weight		-	68 (2.4)	-	g (oz)
T	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	

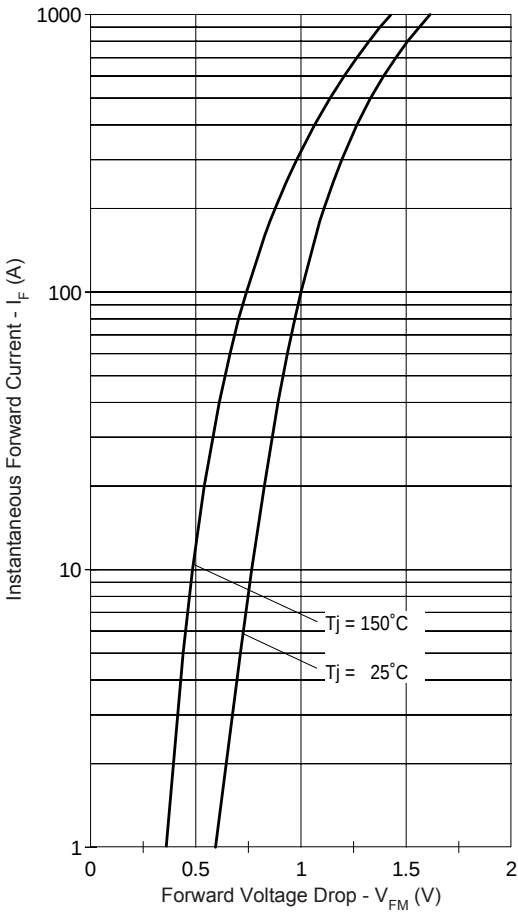


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (per Leg)

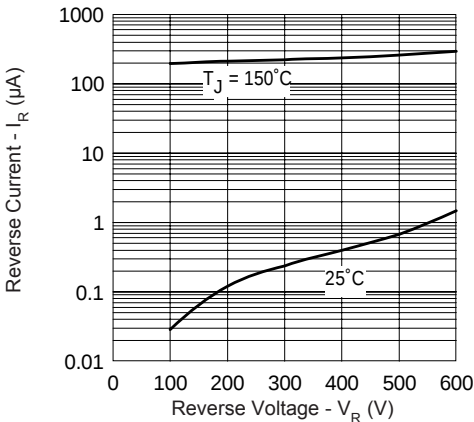


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (per Leg)

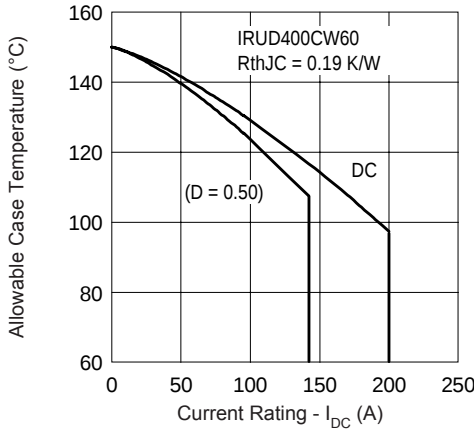


Fig. 3 - Max. Current Rating Capability (per Leg)

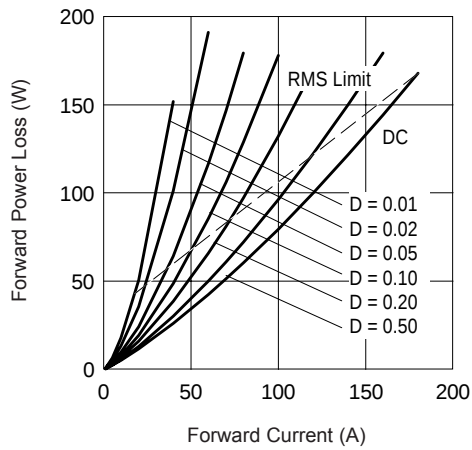


Fig. 4 - Typical Recovery Current vs. di_f/dt (per Leg)

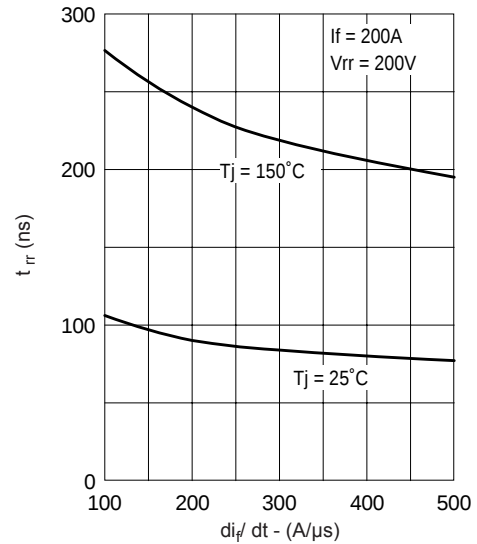


Fig. 5 - Typical Reverse Recovery Time vs. di_f/dt (per Leg)

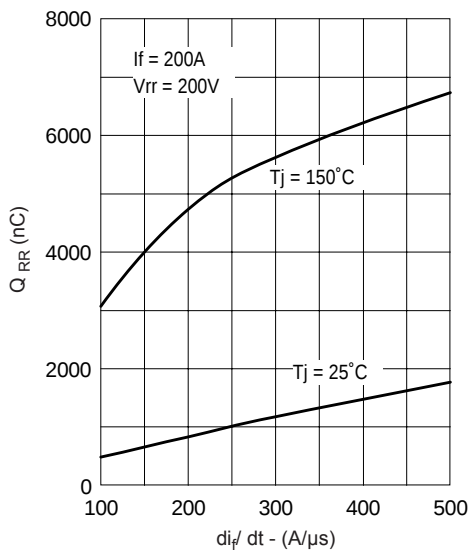


Fig. 6 - Typical Reverse Recovery Charge vs. di_f/dt (per Leg)

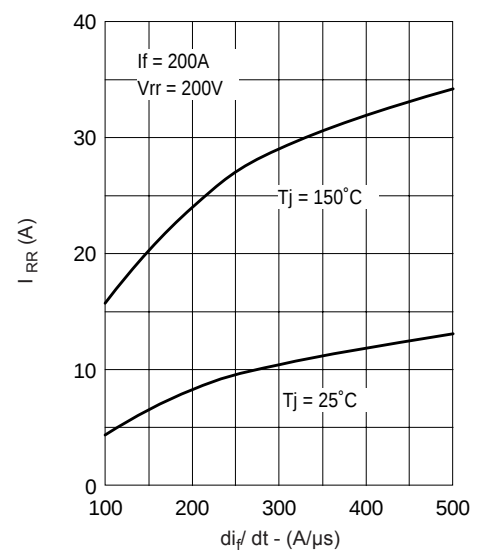


Fig. 7 - Typical Reverse Recovery Current vs. di_f/dt (per Leg)

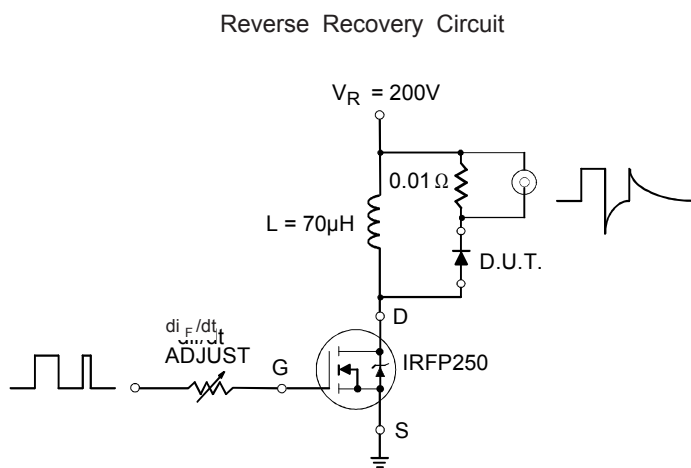
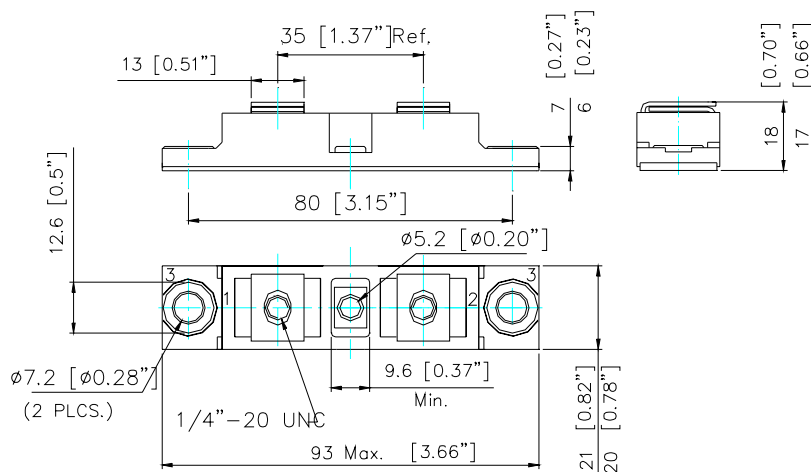


Fig. 8 - Reverse Recovery Parameter Test Circuit

Outline Table



Conforms to JEDEC Outline TO-244
Dimensions in millimeters and (inches)

Ordering Information Table

Device Code					
	IR	UD	400	C	W 60
	①	②	③	④	⑤ ⑥
1	-	International Rectifier			
2	-	UD = Fred			
3	-	Current Rating (400 = 400A)			
4	-	Circuit Configuration (C = Common Cathode)			
5	-	W = TO-244 Wire Bondable not Isolated			
6	-	Voltage Rating (60 = 600V)			

Data and specifications subject to change without notice.
This product has been designed for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

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