

International
IOR Rectifier

60EPU02PbF
 60APU02PbF

Ultrafast Soft Recovery Diode

Features

- Ultrafast Recovery
- 175°C Operating Junction Temperature
- Lead-Free ("PbF" suffix)

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 not significant portion of the total losses.

$$t_{rr} = 35\text{ns}$$

$$I_{F(AV)} = 60\text{Amp}$$

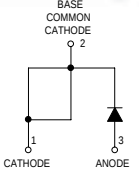
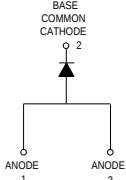
$$V_R = 200\text{V}$$

Absolute Maximum Ratings

Parameters	Max	Units
V_R Cathode to Anode Voltage	200	V
$I_{F(AV)}$ Continuous Forward Current, $T_C = 127^\circ\text{C}$	60	A
I_{FSM} Single Pulse Forward Current, $T_C = 25^\circ\text{C}$	800	
I_{FRM} ① Maximum Repetitive Forward Current	120	
T_J, T_{STG} Operating Junction and Storage Temperatures	- 55 to 175	$^\circ\text{C}$

① Square Wave, 20kHz

Case Styles

60EPU02PbF   TO-247AC (Modified)	60APU02PbF   TO-247AC
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Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
V _{BR} , V _r Breakdown Voltage, Blocking Voltage	200	-	-	V	I _R = 100μA
V _F Forward Voltage	-	0.98	1.08	V	I _F = 60A
	-	0.81	0.88	V	I _F = 60A, T _J = 175°C
I _R Reverse Leakage Current	-	-	50	μA	V _R = V _R Rated
	-	-	2	mA	T _J = 150°C, V _R = V _R Rated
C _T Junction Capacitance	-	87	-	pF	V _R = 200V
L _S Series Inductance	-	8.0	-	nH	Measured lead to lead 5mm from package body

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

Parameters	Min	Typ	Max	Units	Test Conditions
t _{rr} Reverse Recovery Time	-	-	35	ns	I _F = 1.0A, di _F /dt = 200A/μs, V _R = 30V
	-	28	-		T _J = 25°C
	-	50	-		T _J = 125°C
I _{RRM} Peak Recovery Current	-	4	-	A	T _J = 25°C
	-	8	-		T _J = 125°C
Q _{rr} Reverse Recovery Charge	-	59	-	nC	T _J = 25°C
	-	220	-		T _J = 125°C

Thermal - Mechanical Characteristics

Parameters	Min	Typ	Max	Units
R _{thJC} Thermal Resistance, Junction to Case			0.70	K/W
R _{thCS} ② Thermal Resistance, Case to Heatsink		0.2		
Wt Weight		5.5		g
		0.2		(oz)
T Mounting Torque			1.2	N*m
Marking Device	60EPU02, 60APU02			

② Mounting Surface, Flat, Smooth and Greased

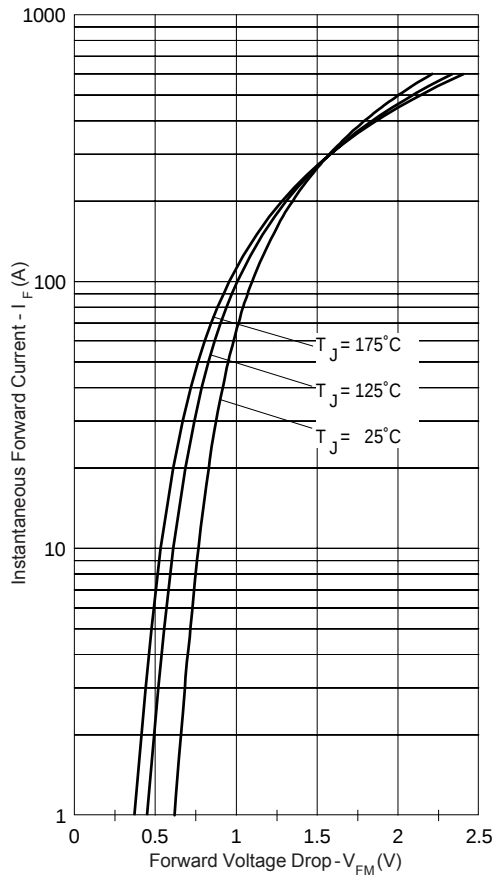


Fig. 1 - Typical Forward Voltage Drop Characteristics

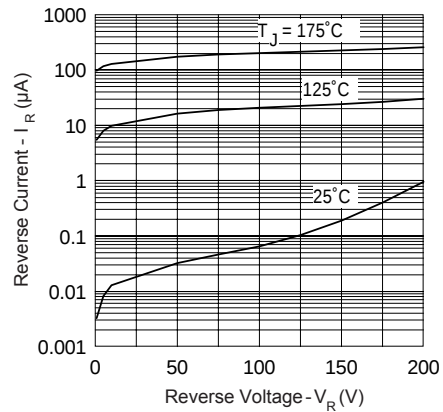


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

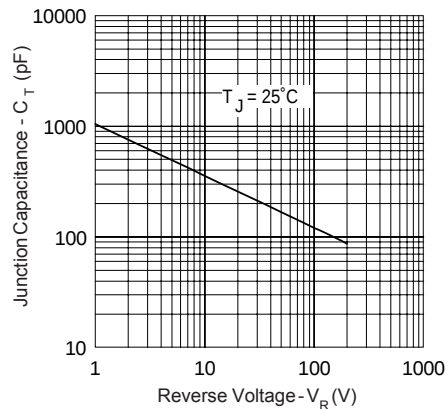


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

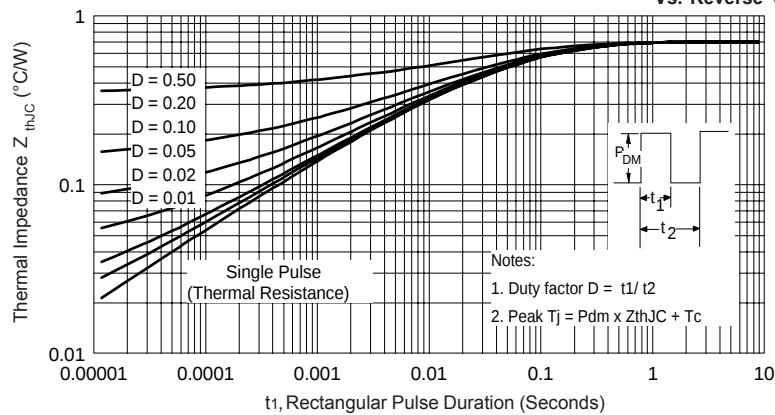


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

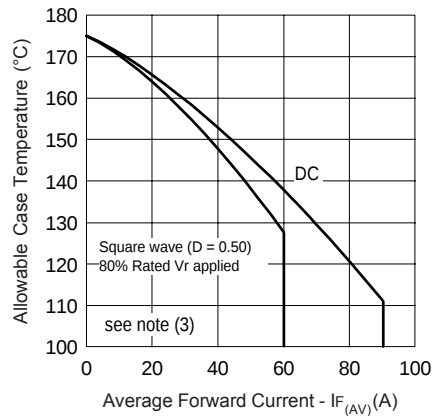


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

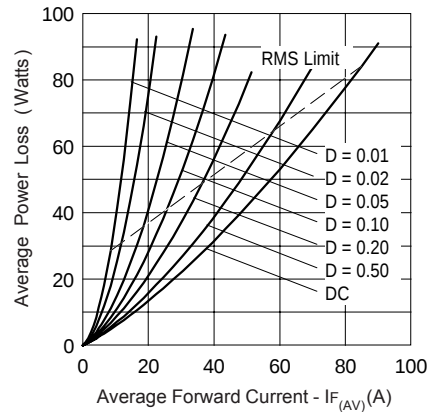


Fig. 6 - Forward Power Loss Characteristics

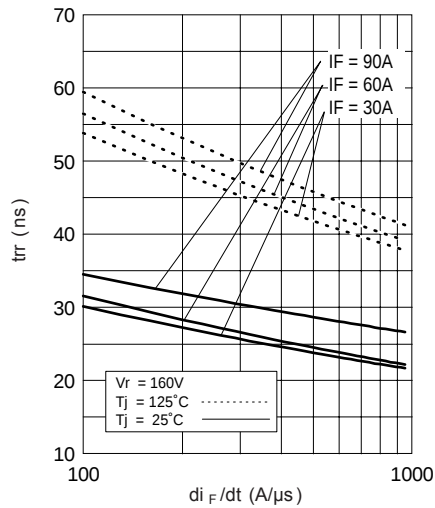


Fig. 7 - Typical Reverse Recovery time vs. di_F/dt

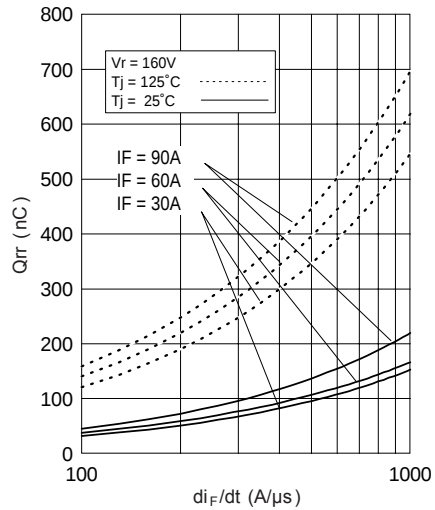


Fig. 8 - Typical Stored Charge vs. di_F/dt

(3) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_{R1} (1 - D)$; $I_{R1} @ V_{R1} = 80\%$ rated V_R

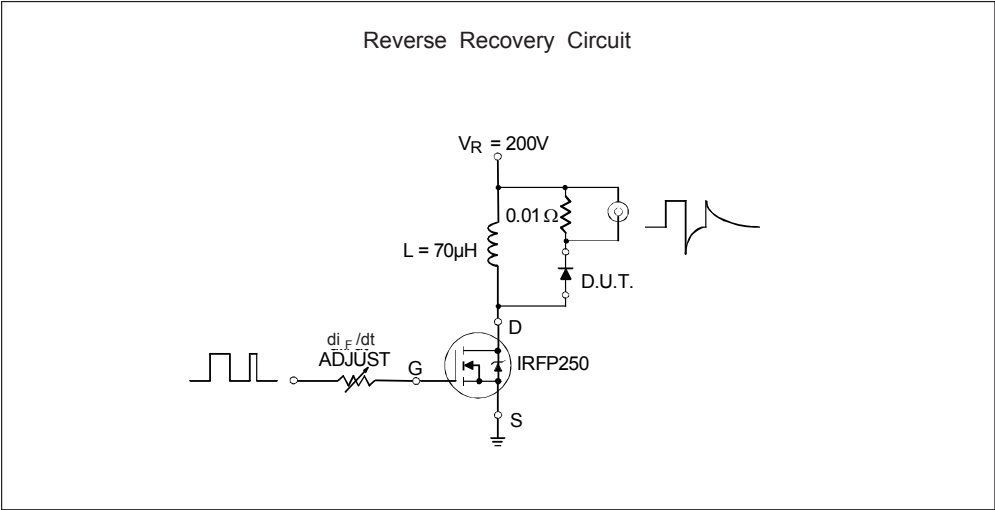


Fig. 9- Reverse Recovery Parameter Test Circuit

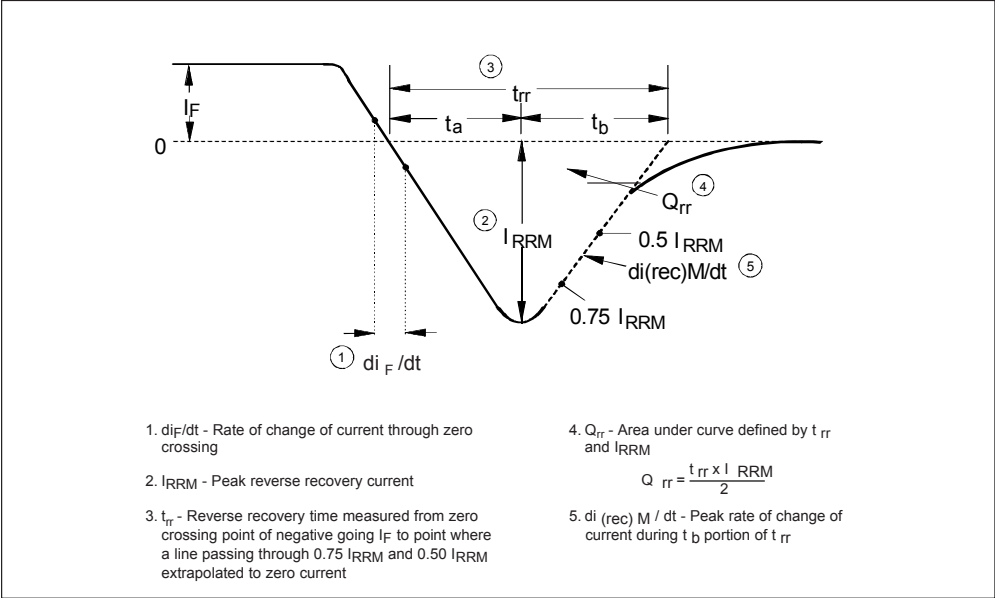
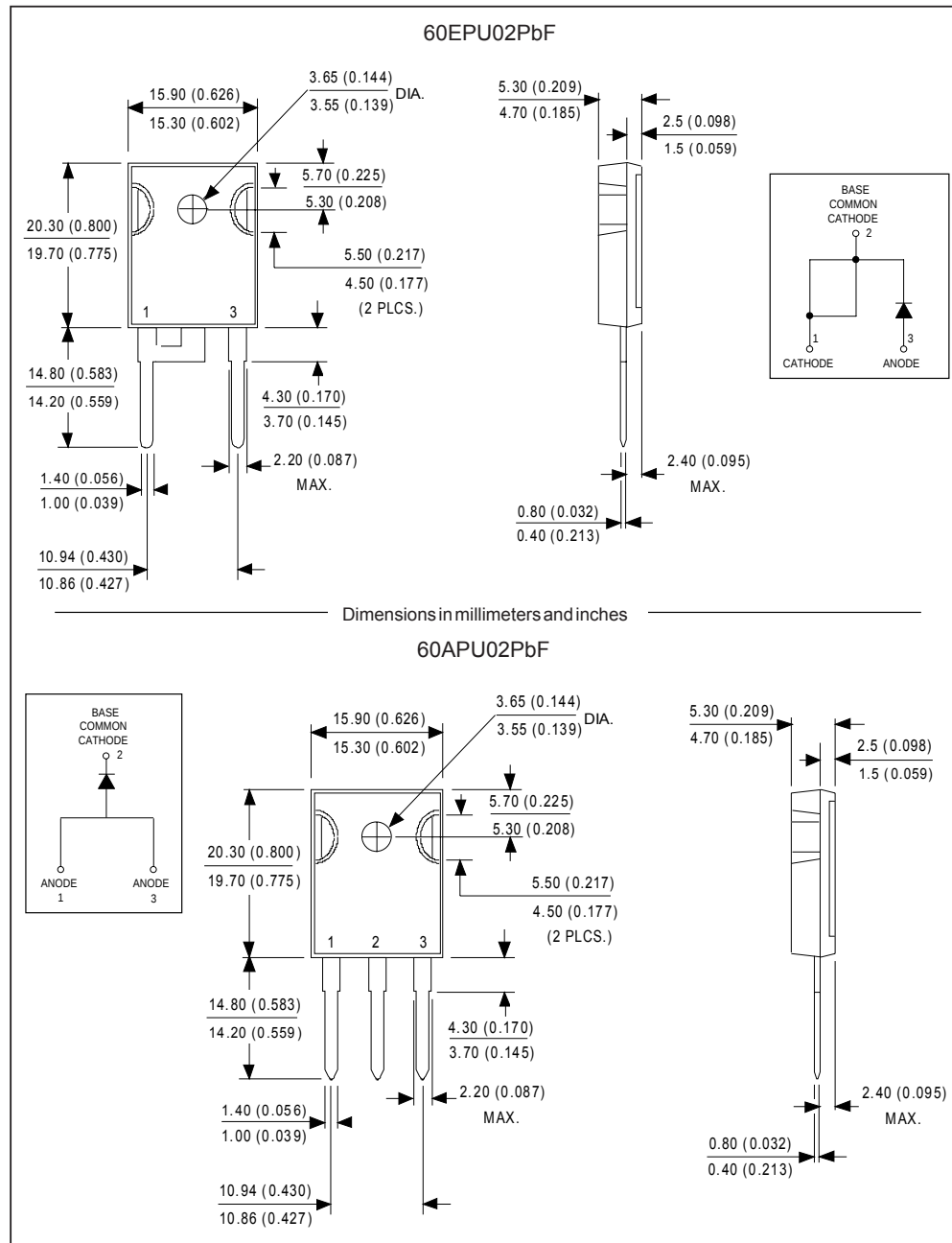


Fig. 10 - Reverse Recovery Waveform and Definitions

Outline Table



Marking Information

EXAMPLE: THIS IS A 60EPU02
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN ASSEMBLY LINE "H"

INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE

PART NUMBER

DATE CODE
P = LEAD-FREE
YEAR 0 = 2000
WEEK 35
LINE H

EXAMPLE: THIS IS A 60APU02
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN ASSEMBLY LINE "H"

INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE

PART NUMBER

DATE CODE
P = LEAD-FREE
YEAR 0 = 2000
WEEK 35
LINE H

Ordering Information Table

Device Code					
60	E	P	U	02	PbF
1	2	3	4	5	6
1	-	Current Rating (60 = 60A)			
2	-	Circuit Configuration:			
		E = Single Diode			
		A = Single Diode, 3 pins			
3	-	Package:			
		P = TO-247AC (Modified)			
4	-	Type of Silicon:			
		U = UltraFast Recovery			
5	-	Voltage Rating (02 = 200V)			
6	-	• none = Standard Production			
		• PbF = Lead-Free			

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

International
IOR Rectifier

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08/05



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