



60EPU06PbF
60APU06PbF

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

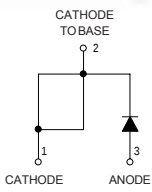
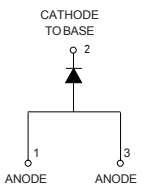
These diodes are optimized to reduce losses and EMI/ RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for HF welding, power converters and other applications where switching losses are not significant portion of the total losses.

$t_{rr} = 34ns \text{ (typ)}$ $I_{F(AV)} = 60Amp$ $V_R = 600V$

Absolute Maximum Ratings

Parameters	Max	Units
V_R Cathode to Anode Voltage	600	V
$I_{F(AV)}$ Continuous Forward Current, $T_C = 116^{\circ}C$	60	A
I_{FSM} Single Pulse Forward Current, $T_C = 25^{\circ}C$	600	
I_{FRM} ① Maximum Repetitive Forward Current	120	
T_J, T_{STG} Operating Junction and Storage Temperatures	- 55 to 175	$^{\circ}C$

① Square Wave, 20kHz

Case Styles	
60EPU06PbF  CATHODE TO BASE  CATHODE ANODE TO-247AC (Modified)	60APU06PbF  CATHODE TO BASE  ANODE ANODE TO-247AC

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

Parameters	Min	Typ	Max	Units	Test Conditions
V _{BR} , V _r Breakdown Voltage, Blocking Voltage	600	-	-	V	I _R = 100μA
V _F Forward Voltage	-	1.35	1.68	V	I _F = 60A
	-	1.20	1.42	V	I _F = 60A, T _J = 125°C
	-	1.11	1.30	V	I _F = 60A, T _J = 175°C
I _R Reverse Leakage Current	-	-	50	μA	V _R = V _R Rated
	-	-	500	μA	T _J = 150°C, V _R = V _R Rated
C _T Junction Capacitance	-	39	-	pF	V _R = 600V

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

Parameters	Min	Typ	Max	Units	Test Conditions
t _{rr} Reverse Recovery Time	-	34	45	ns	I _F = 1A, di _F /dt = 200A/μs, V _R = 30V
	-	81	-		T _J = 25°C
	-	164	-		T _J = 125°C
I _{RRM} Peak Recovery Current	-	7.4	-	A	T _J = 25°C
	-	17.0	-		T _J = 125°C
Q _{rr} Reverse Recovery Charge	-	300	-	nC	T _J = 25°C
	-	1394	-		T _J = 125°C

Thermal - Mechanical Characteristics

Parameters	Min	Typ	Max	Units
R _{thJC} Thermal Resistance, Junction to Case			0.63	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		2.4	N * m
	10		20	lbf.in
Marking Device	60EPU06, 60APU06			

② Mounting Surface, Flat, Smooth and Greased

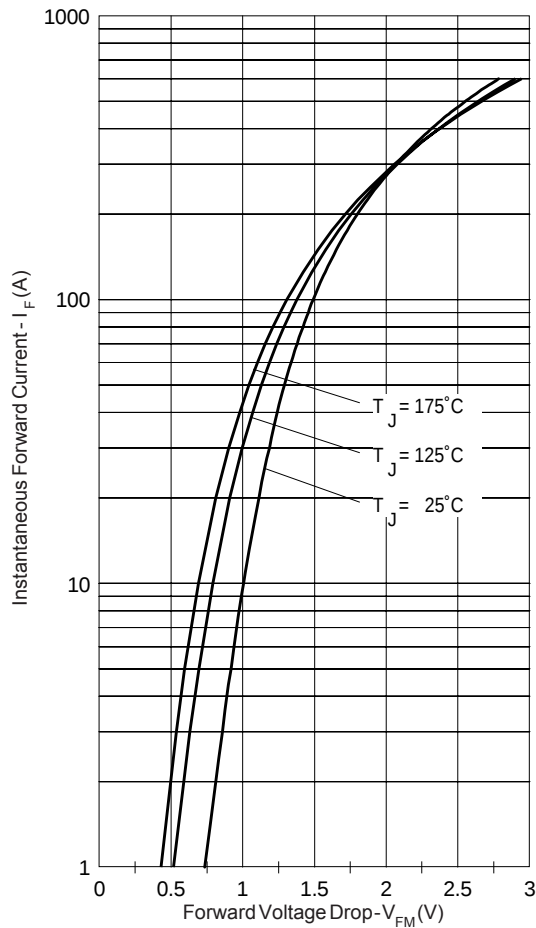


Fig. 1 - Typical Forward Voltage Drop Characteristics

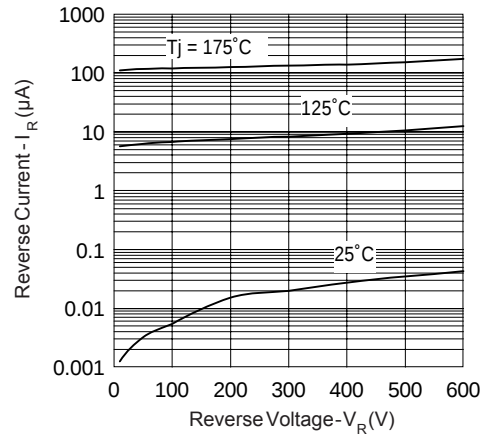


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

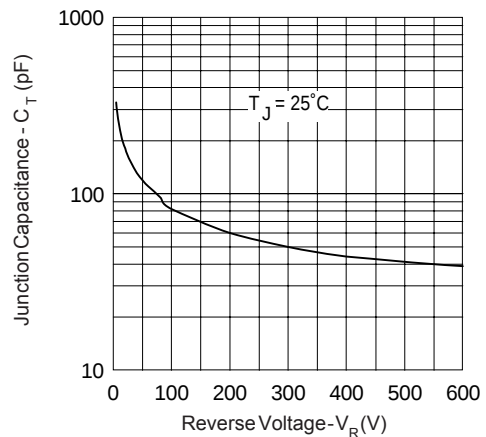


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

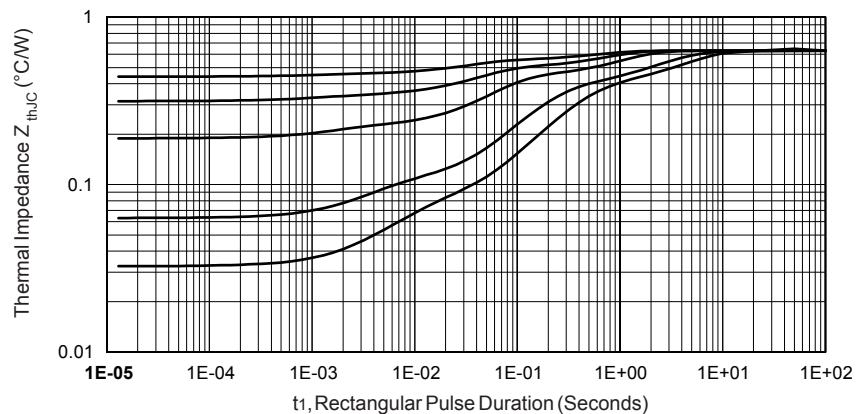


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

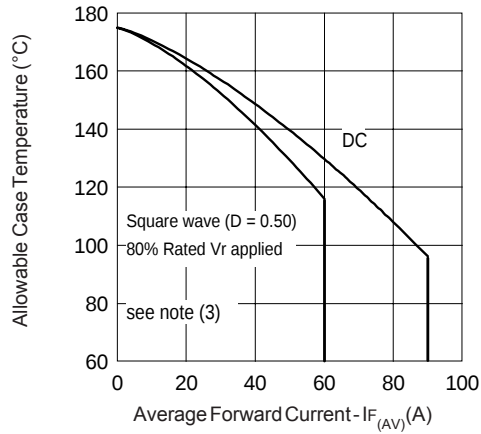


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

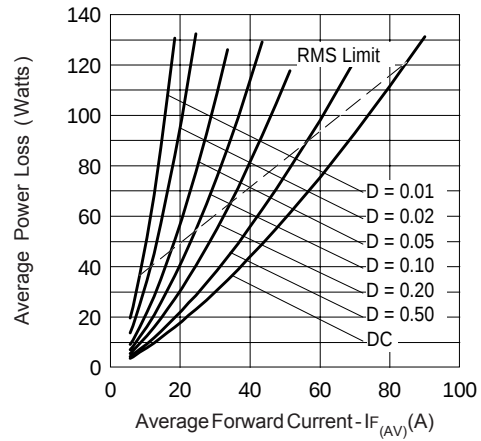


Fig. 6 - Forward Power Loss Characteristics

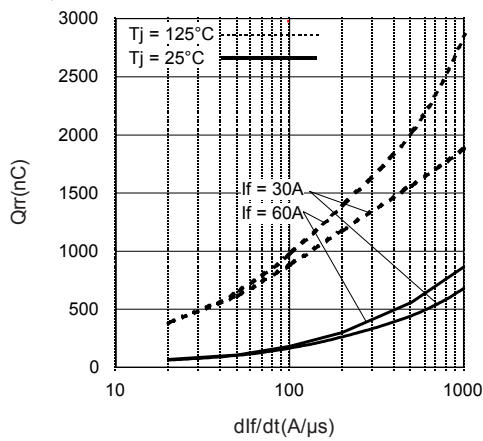


Fig. 7 - Typical Stored Charge vs. di/dt

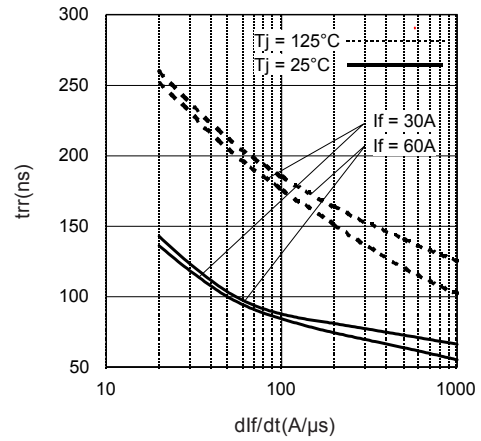


Fig. 87 - Typical Stored Charge vs. di/dt

(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 = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

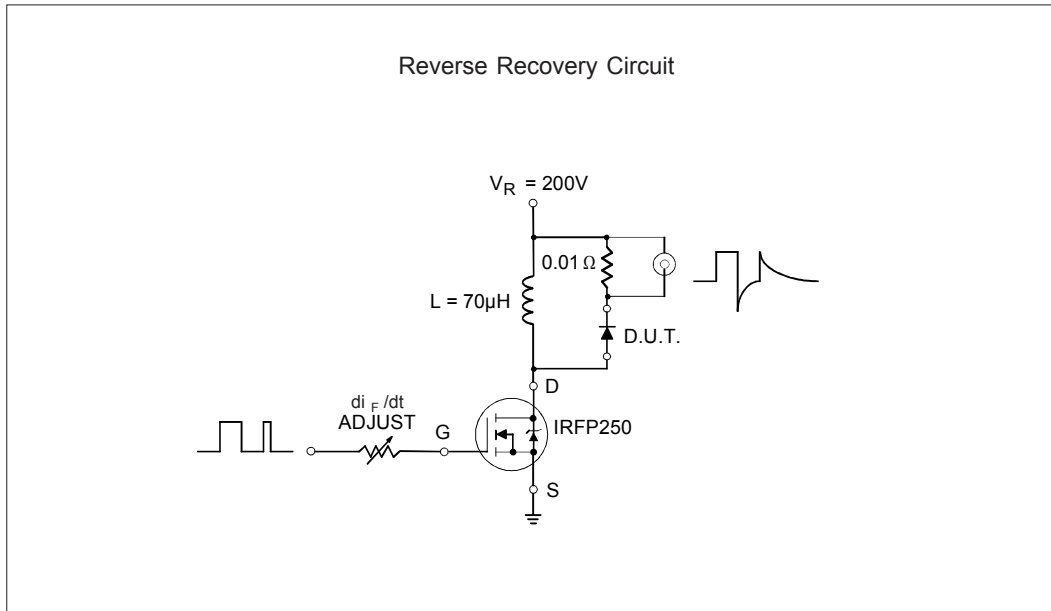


Fig. 9 - Reverse Recovery Parameter Test Circuit

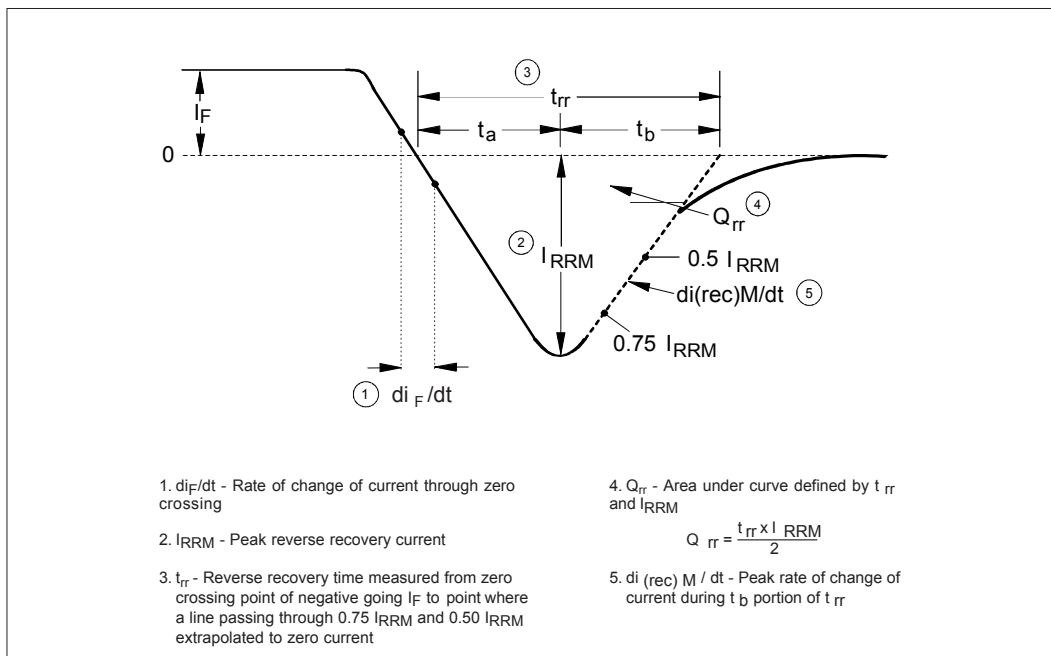
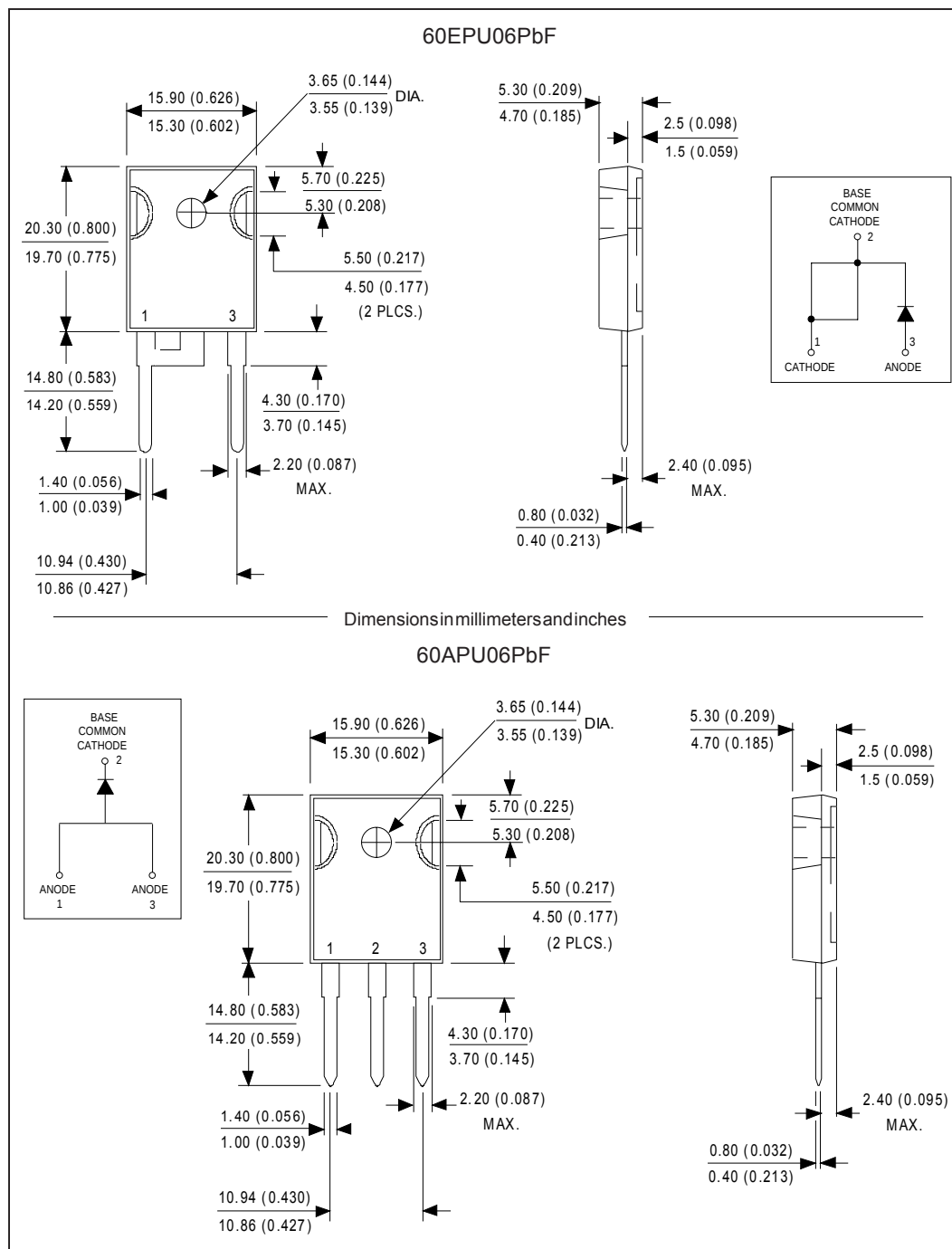
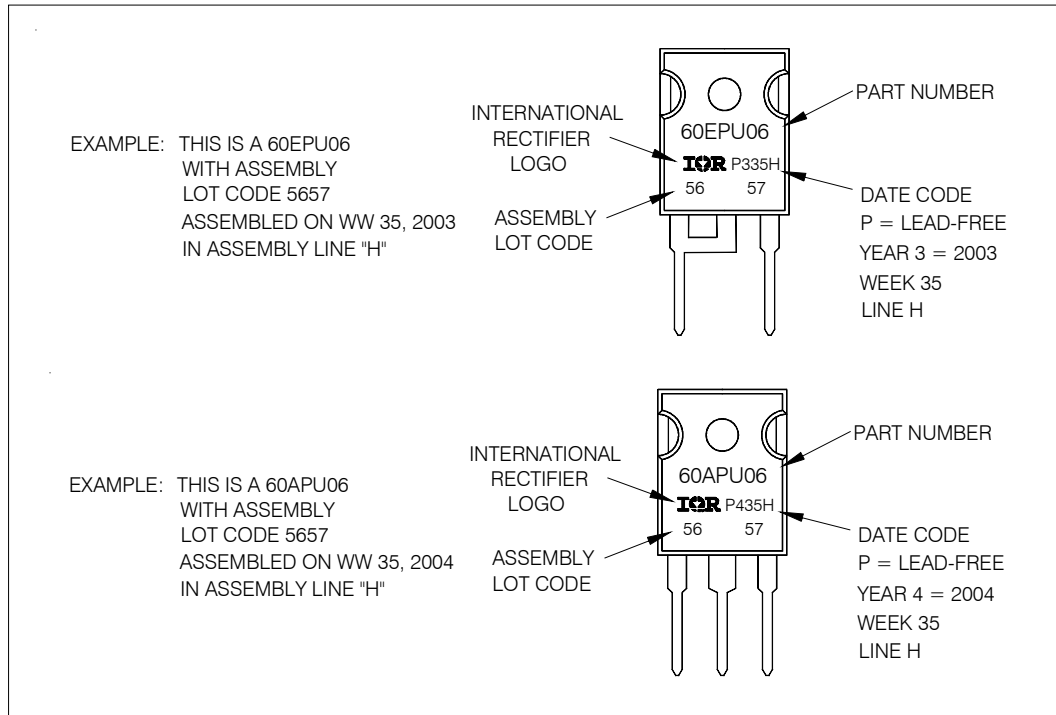


Fig. 10 - Reverse Recovery Waveform and Definitions

Outline Table



Marking Information



Ordering Information Table

Device Code					
60	E	P	U	06	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 (06 = 600V)				
6	- • none = Standard Production				
	• PbF = Lead-Free				

60EPU06PbF/ 60APU06PbF

Bulletin PD-21099 11/05

International
IOR Rectifier

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.

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