



60EPU06
60APU06

Ultrafast Soft Recovery Diode

Features

- Ultrafast Recovery
- 175°C Operating Junction Temperature

Benefits

- Reduced RFI and EMI
- Higher Frequency Operation
- Reduced Snubbing
- Reduced Parts Count

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

Description/ Applications


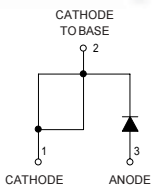

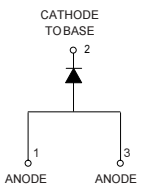
These diodes are optimized to reduce losses and EMI/ RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for HF welding, power converters and other applications where switching losses are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

Absolute Maximum Ratings

Parameters	Max	Units
V_R Cathode to Anode Voltage	600	V
$I_{F(AV)}$ Continuous Forward Current, $T_C = 116^\circ\text{C}$	60	A
I_{FSM} Single Pulse Forward Current, $T_C = 25^\circ\text{C}$	600	
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

<p>60EPU06</p>   <p>TO-247AC (Modified)</p>	<p>60APU06</p>   <p>TO-247AC</p>
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Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
V_{BR}, V_r Breakdown Voltage, Blocking Voltage	600	-	-	V	$I_R = 100\mu\text{A}$
V_F Forward Voltage	-	1.35	1.68	V	$I_F = 60\text{A}$
	-	1.20	1.42	V	$I_F = 60\text{A}, T_J = 125^\circ\text{C}$
	-	1.11	1.30	V	$I_F = 60\text{A}, T_J = 175^\circ\text{C}$
I_R Reverse Leakage Current	-	-	50	μA	$V_R = V_R \text{ Rated}$
	-	-	500	μA	$T_J = 150^\circ\text{C}, V_R = V_R \text{ Rated}$
C_T Junction Capacitance	-	39	-	pF	$V_R = 600\text{V}$

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

Parameters	Min	Typ	Max	Units	Test Conditions	
t_{rr} Reverse Recovery Time	-	34	45	ns	$I_F = 1\text{A}, di_F/dt = 200\text{A}/\mu\text{s}, V_R = 30\text{V}$ $I_F = 60\text{A}$ $V_R = 200\text{V}$ $di_F/dt = 200\text{A}/\mu\text{s}$	
	-	81	-			$T_J = 25^\circ\text{C}$
	-	164	-			$T_J = 125^\circ\text{C}$
I_{RRM} Peak Recovery Current	-	7.4	-	A	$T_J = 25^\circ\text{C}$	
	-	17.0	-		$T_J = 125^\circ\text{C}$	
Q_{rr} Reverse Recovery Charge	-	300	-	nC	$T_J = 25^\circ\text{C}$	
	-	1394	-		$T_J = 125^\circ\text{C}$	

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

② Mounting Surface, Flat, Smooth and Greased

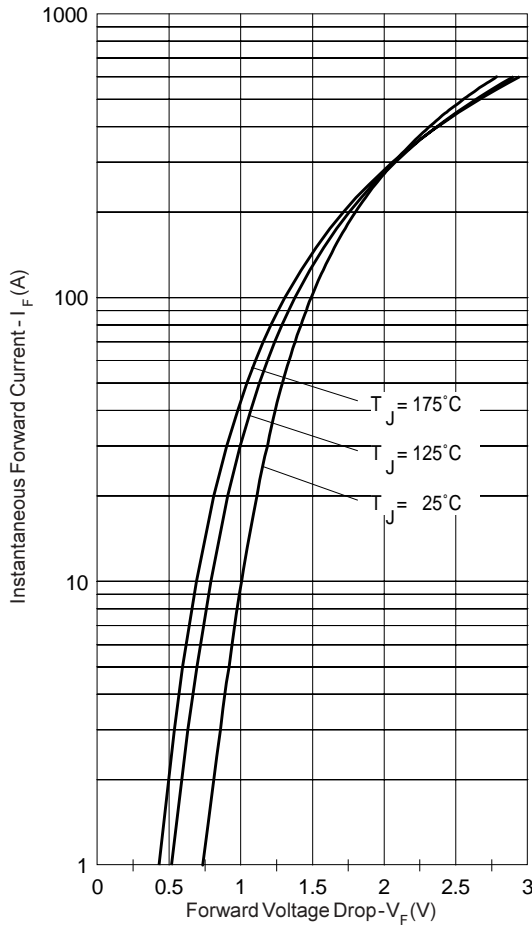


Fig. 1 - Typical Forward Voltage Drop Characteristics

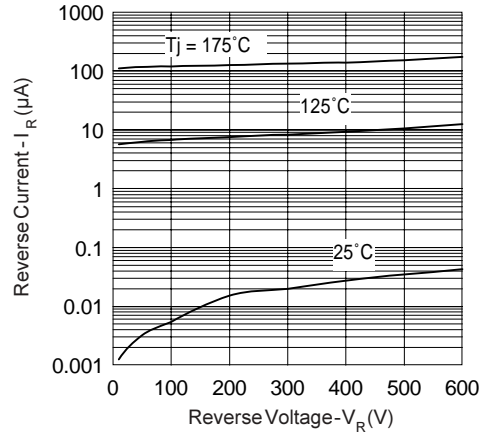


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

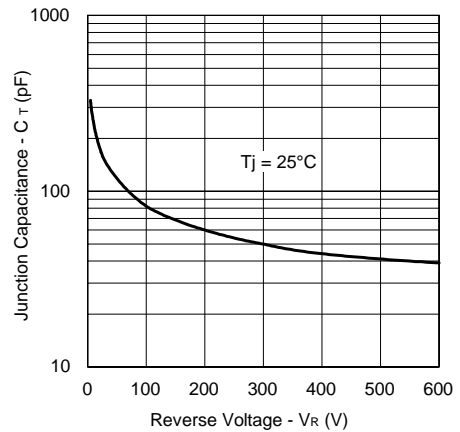


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

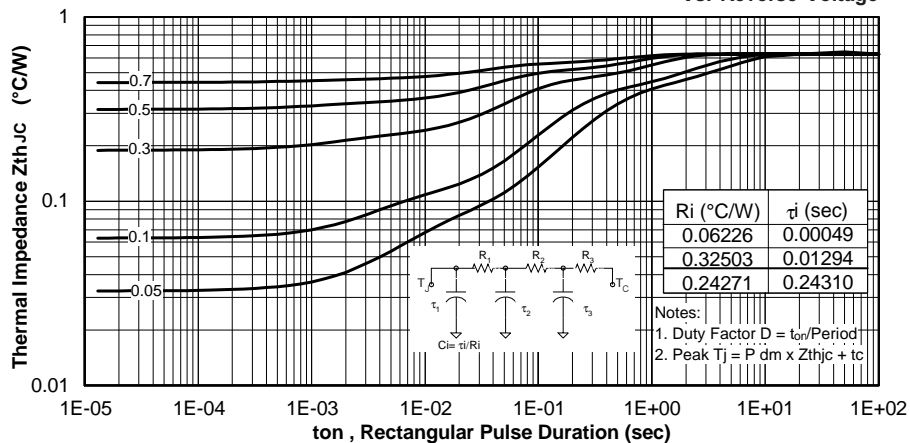


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

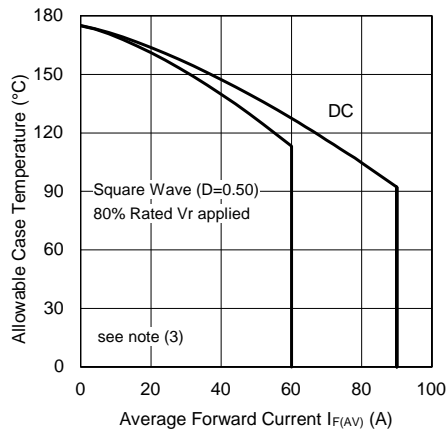


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

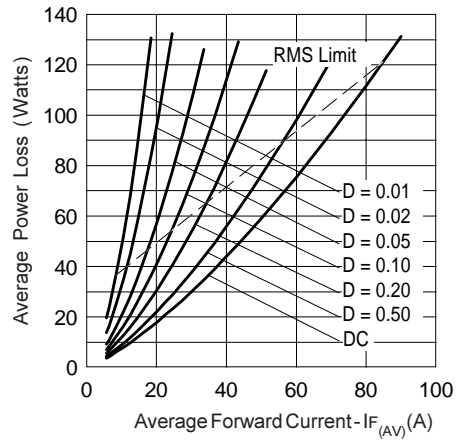


Fig. 6 - Forward Power Loss Characteristics

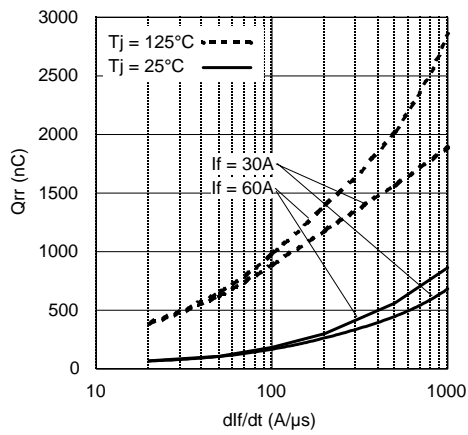


Fig. 7 - Typical Stored Charge vs. di/dt

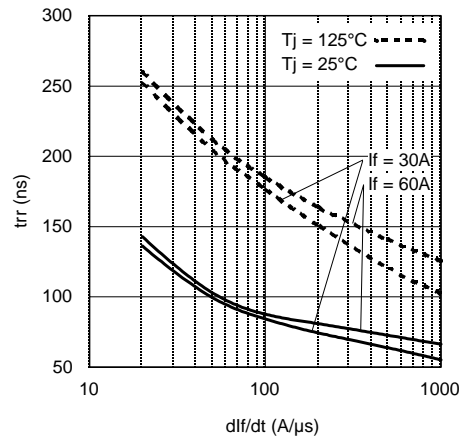


Fig. 8 - Typical Reverse Recovery Time vs. di/dt

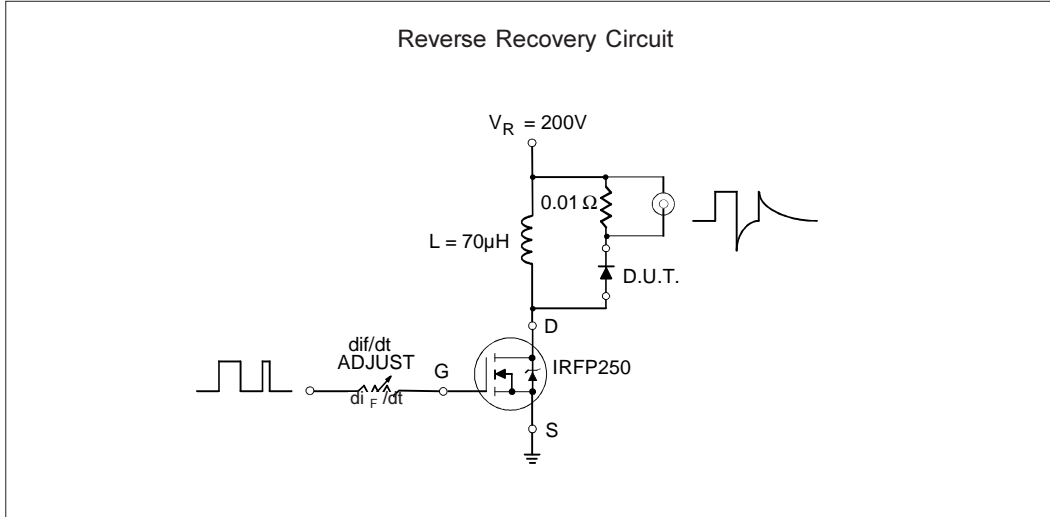


Fig. 7 - Reverse Recovery Parameter Test Circuit

- (3) Formula used: $T_c = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

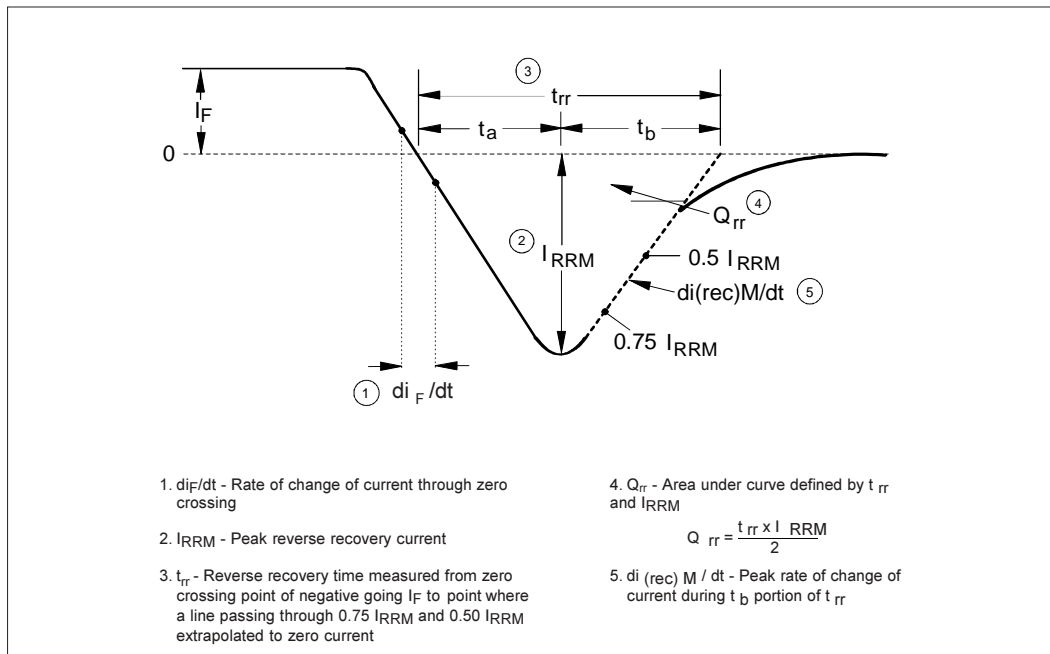
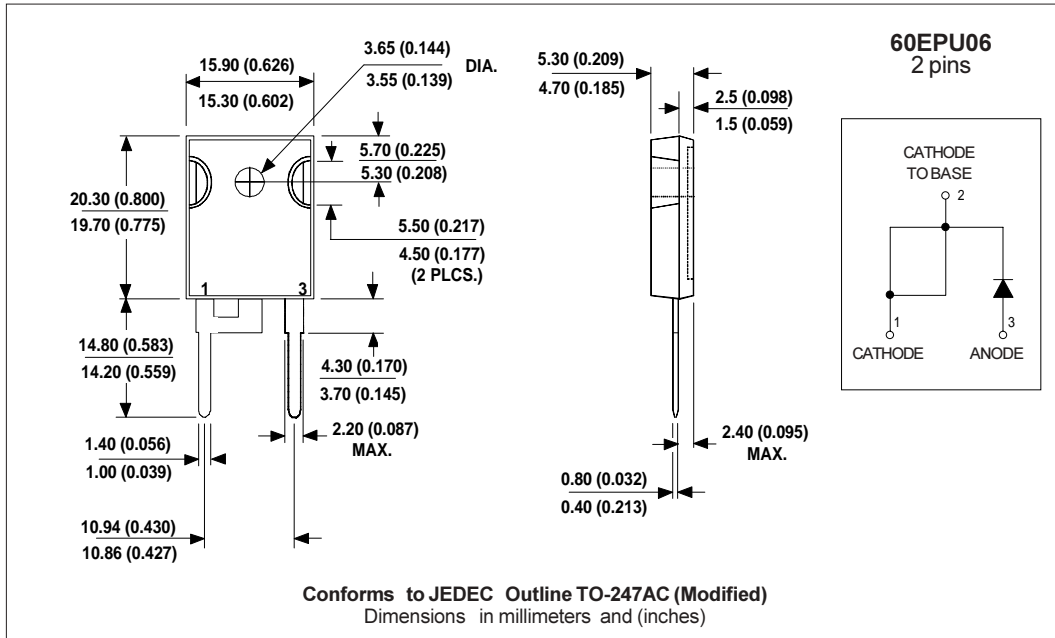
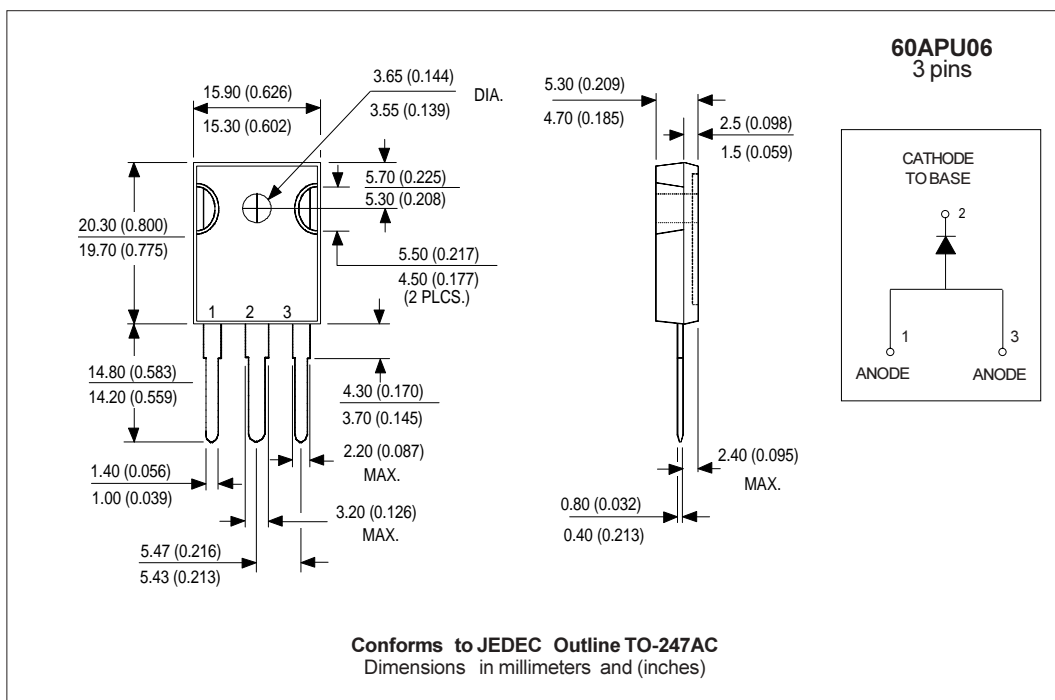


Fig. 8 - Reverse Recovery Waveform and Definitions

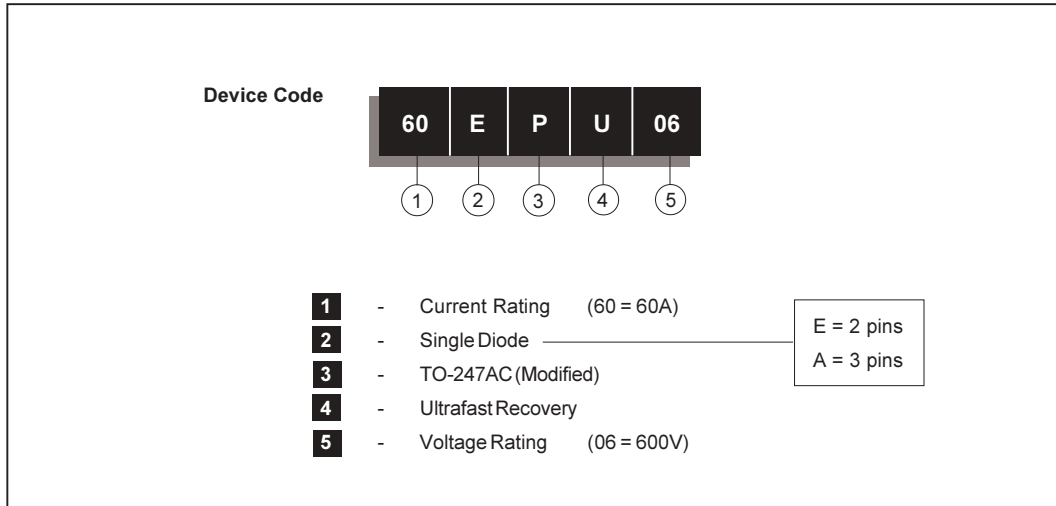
Outline Table



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Ordering Information 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.