



60EPU02
60APU02

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

$t_{rr} = 35ns$
$I_{F(AV)} = 60Amp$
$V_R = 200V$

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

① Square Wave, 20kHz

Case Styles	
<p>60EPU02</p> <p>TO-247AC (Modified)</p>	<p>60APU02</p> <p>TO-247AC</p>

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	200	-	-	V	$I_R = 100\mu\text{A}$
V_F Forward Voltage	-	0.98	1.08	V	$I_F = 60\text{A}$
	-	0.81	0.88	V	$I_F = 60\text{A}, T_J = 175^\circ\text{C}$
I_R Reverse Leakage Current	-	-	50	μA	$V_R = V_R$ Rated
	-	-	2	mA	$T_J = 150^\circ\text{C}, V_R = V_R$ Rated
C_T Junction Capacitance	-	87	-	pF	$V_R = 200\text{V}$
L_S Series Inductance	-	8.0	-	nH	Measured lead to lead 5mm from package body

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

Parameters	Min	Typ	Max	Units	Test Conditions
t_{rr} Reverse Recovery Time	-	-	35	ns	$I_F = 1.0\text{A}, di_F/dt = 200\text{A}/\mu\text{s}, V_R = 30\text{V}$
	-	28	-		$T_J = 25^\circ\text{C}$
	-	50	-		$T_J = 125^\circ\text{C}$
I_{RRM} Peak Recovery Current	-	4	-	A	$T_J = 25^\circ\text{C}$
	-	8	-		$T_J = 125^\circ\text{C}$
Q_{rr} Reverse Recovery Charge	-	59	-	nC	$T_J = 25^\circ\text{C}$
	-	220	-		$T_J = 125^\circ\text{C}$

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

② Mounting Surface, Flat, Smooth and Greased

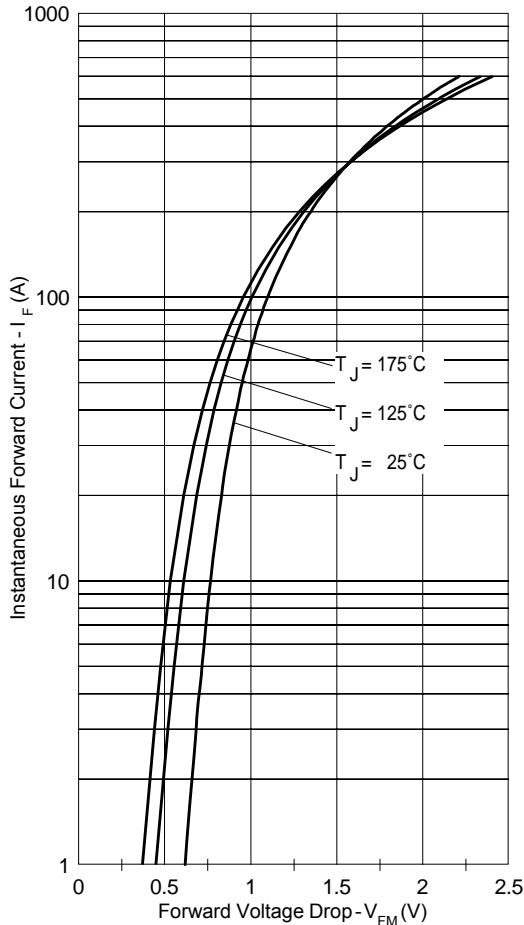


Fig. 1 - Typical Forward Voltage Drop Characteristics

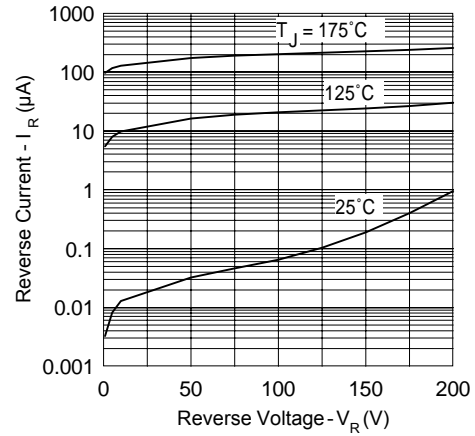


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

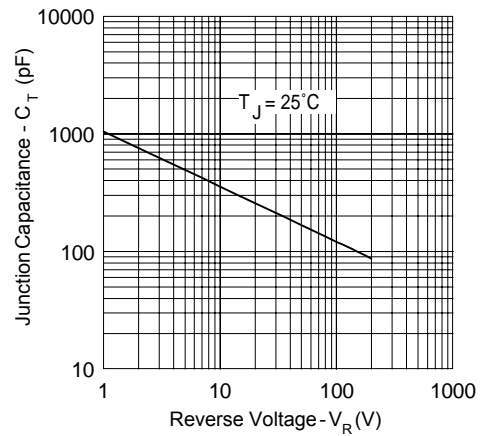


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

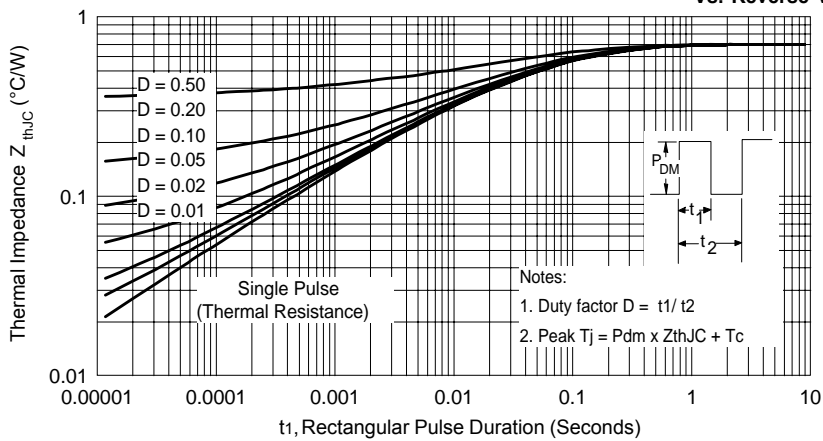


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

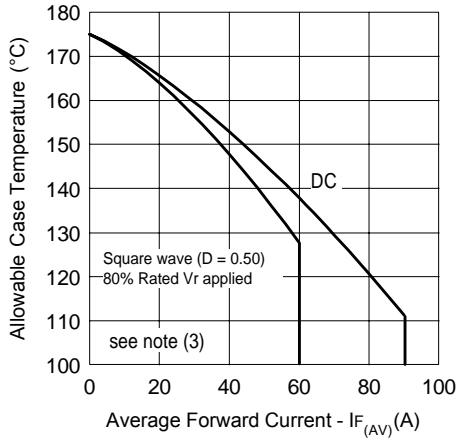


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

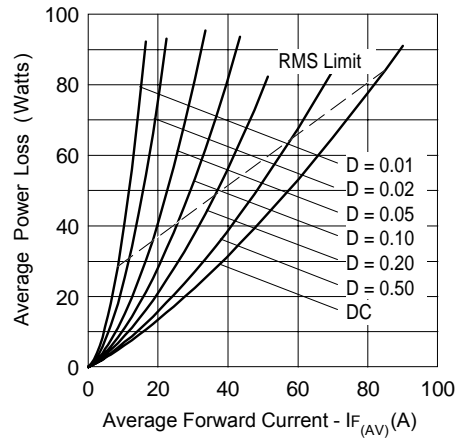


Fig. 6 - Forward Power Loss Characteristics

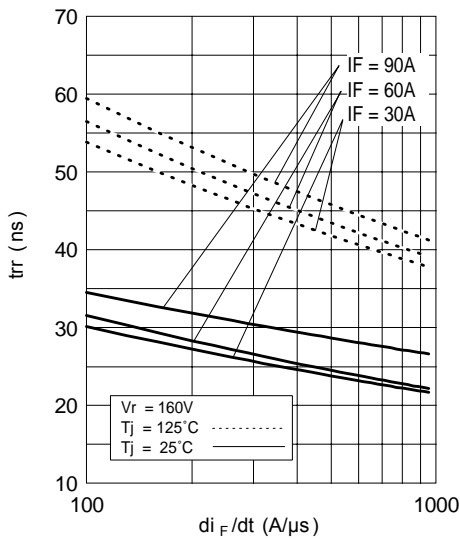


Fig. 7 - Typical Reverse Recovery time vs. di_F/dt

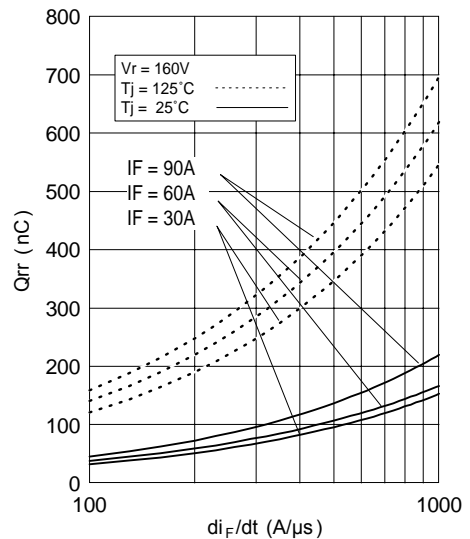


Fig. 8 - Typical Stored Charge vs. di_F/dt

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

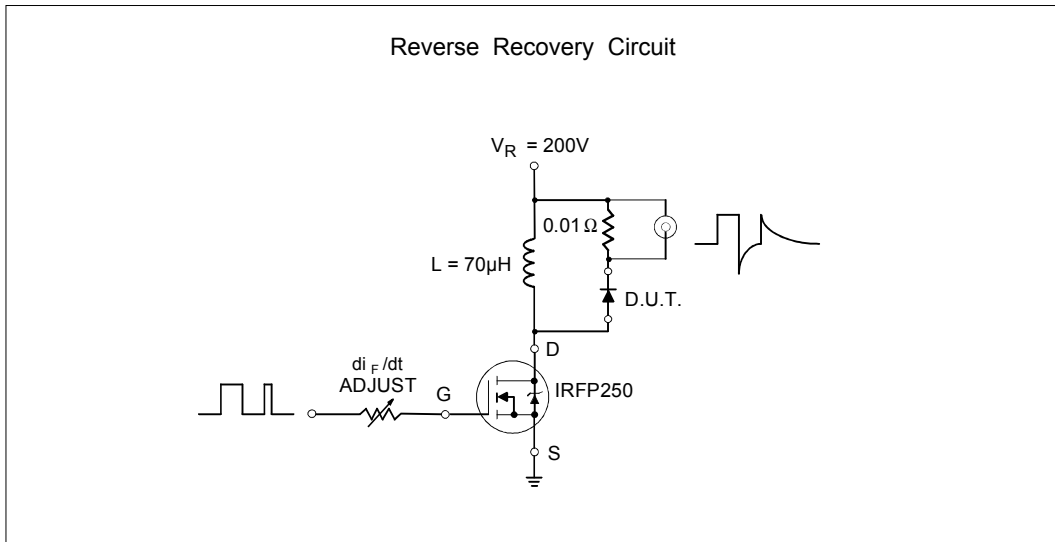


Fig. 9- Reverse Recovery Parameter Test Circuit

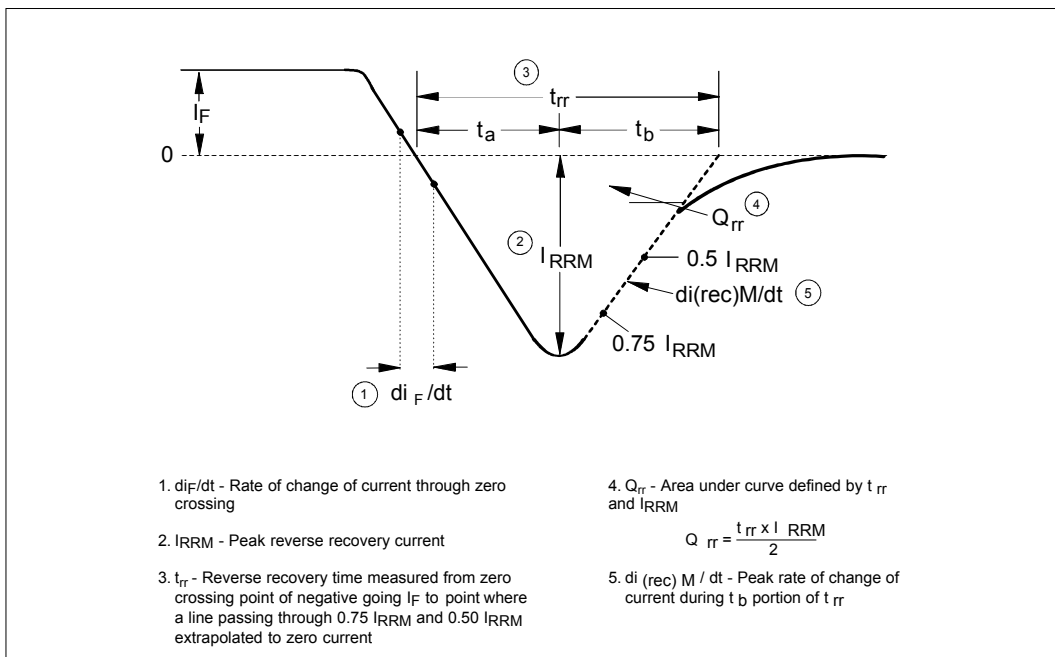
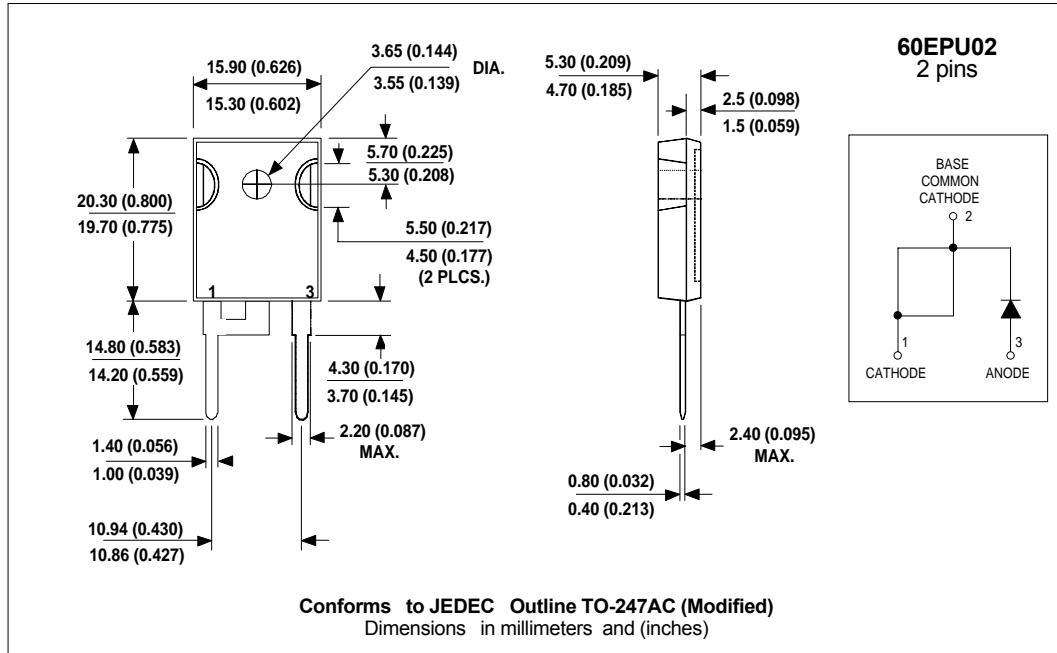
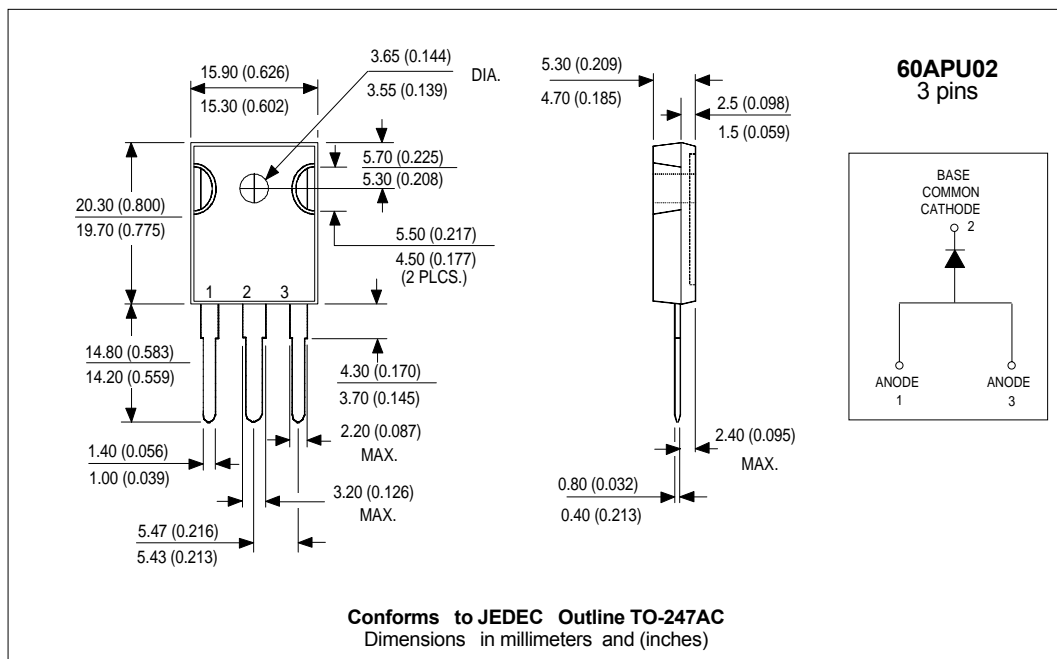


Fig. 10 - Reverse Recovery Waveform and Definitions

Outline Table



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Ordering Information Table

Device Code				
60	E	P	U	02
①	②	③	④	⑤
1	-	Current Rating		(60 = 60A)
2	-	Single Diode:		E = Single Diode A = Single Diode (3 pins)
3	-	TO-247AC (Modified)		
4	-	Ultrafast Recovery		
5	-	Voltage Rating		(02 = 200V)

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.



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