

Bulletin I2113 rev. D 04/99

International
IOR Rectifier

QUIETIR Series
60EPF.. 60CPF..

FAST SOFT RECOVERY
RECTIFIER DIODE



$V_F < 1.1V @ 30A$
 $t_{rr} = 70ns$
 $V_{RRM} 200 \text{ to } 600V$

Description/Features

The 60EPF.. & 60CPF.. fast soft recovery **QUIETIR** rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop. The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

Typical applications are both:

- Output rectification and freewheeling in inverters, choppers and converters
- and input rectifications where severe restrictions on conducted EMI should be met.

Major Ratings and Characteristics

Characteristics	60EPF.. 60CPF..	Units
$I_{F(AV)}$ Sinusoidal waveform	60	A
V_{RRM}	200 to 600	V
I_{FSM}	830	A
$V_F @ 30A, T_J = 25^{\circ}C$	1.1	V
$t_{rr} @ 1A, 100A/\mu s$	70	ns
T_J	-40 to 150	$^{\circ}C$

Package Outline



60EPF.. 60CPF.. QUIETIR Series

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Voltage Ratings

Part Number	V_{RRM} , maximum peak reverse voltage V	V_{RSM} , maximum non repetitive peak reverse voltage V	I_{RRM} 150°C mA
60EPF02, 60CPF02	200	300	5
60EPF04, 60CPF04	400	500	
60EPF06, 60CPF06	600	700	

Absolute Maximum Ratings

Parameters	60.PF..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	60	A	@ $T_C = 106^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	700	A	10ms Sine pulse, rated V_{RRM} applied
	830		10ms Sine pulse, no voltage reappplied
I^2t Max. I^2t for fusing	2450	A^2s	10ms Sine pulse, rated V_{RRM} applied
	3460		10ms Sine pulse, no voltage reappplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	34600	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reappplied

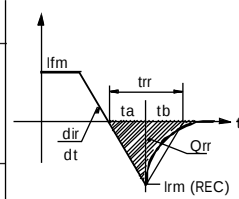
Electrical Specifications

Parameters	60.PF..	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.3	V	@ 60A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	5.0	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.88	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	5.0		$T_J = 150^\circ\text{C}$

$V_R = \text{rated } V_{RRM}$

Typical Recovery Characteristics

Parameters	60.PF..	Units	Conditions
t_{rr} Reverse Recovery Time	180	ns	$I_F @ 60\text{Apk}$ $@ 25A/\mu s$ $@ 25^\circ\text{C}$
I_{rr} Reverse Recovery Current	3.4	A	
Q_{rr} Reverse Recovery Charge	0.5	μC	
S Snap Factor t_b/t_a	0.5	typical	



Thermal-Mechanical Specifications

Parameters			60.PF..	Units	Conditions
T _J	Max. Junction Temperature Range		-40to150	°C	
T _{stg}	Max. Storage Temperature Range		-40to150	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case		0.4	°C/W	DCoperation
R _{thJA}	Max. Thermal Resistance Junction to Ambient		40	°C/W	
R _{thCS}	Typical Thermal Resistance, Case to Heatsink		0.2	°C/W	Mounting surface , smooth and greased
wt	Approximate Weight		6(0.21)	g(oz.)	
T	Mounting Torque	Min.	6(5)	Kg-cm (lbf-in)	
		Max.	12(10)		
Case Style			TO-247AC		JEDEC (Modified)

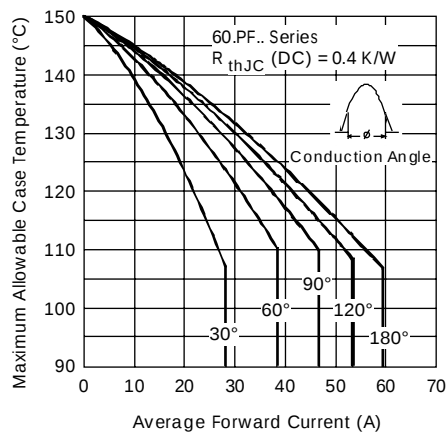


Fig. 1 - Current Rating Characteristics

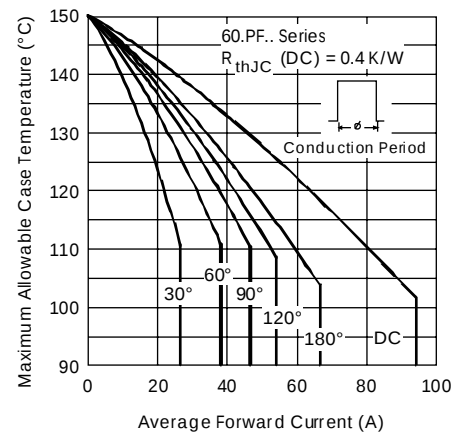


Fig. 2 - Current Rating Characteristics

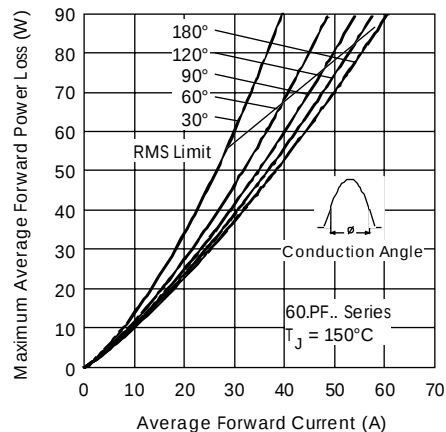


Fig. 3 - Forward Power Loss Characteristics

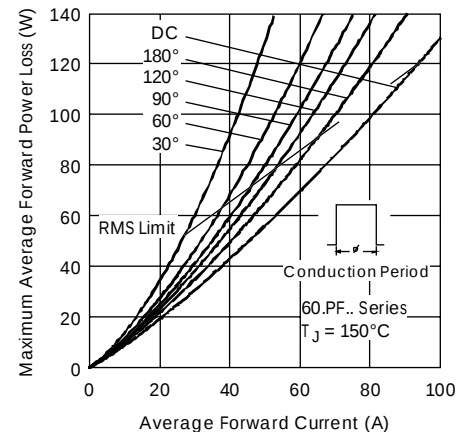


Fig. 4 - Forward Power Loss Characteristics

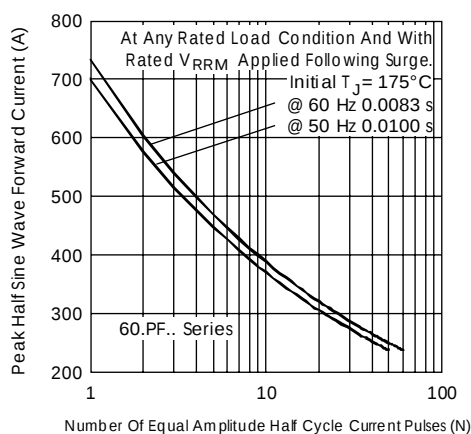


Fig. 5 - Maximum Non-Repetitive Surge Current

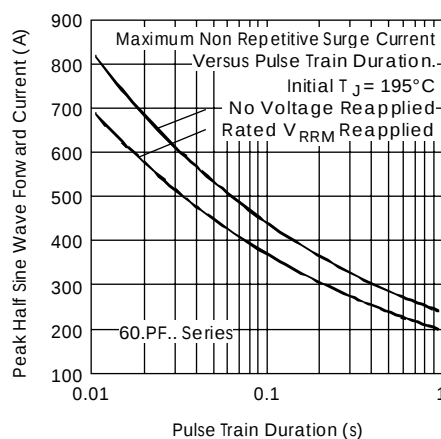


Fig. 6 - Maximum Non-Repetitive Surge Current

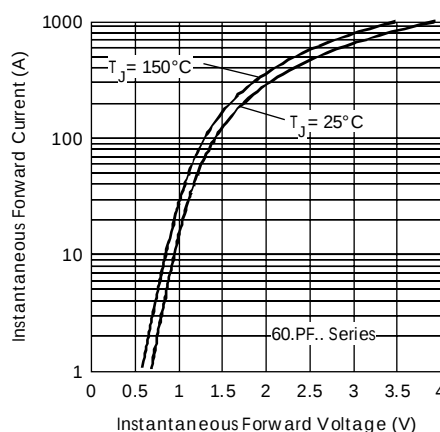


Fig. 7 - Forward Voltage Drop Characteristics

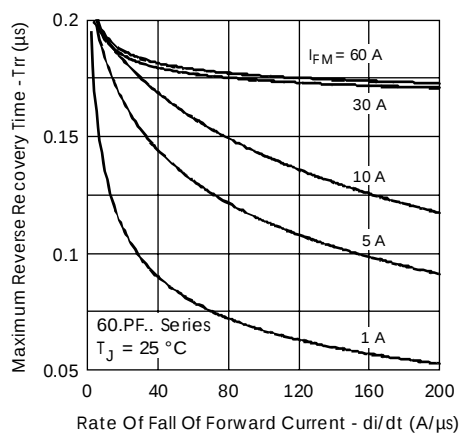


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

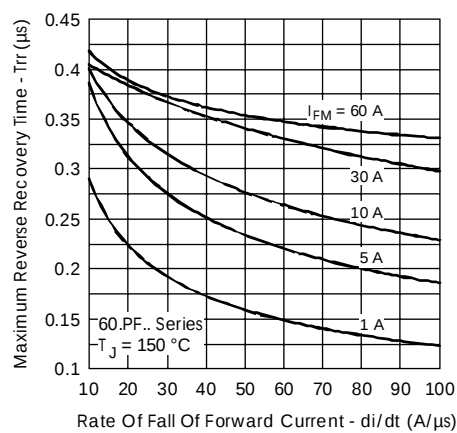


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

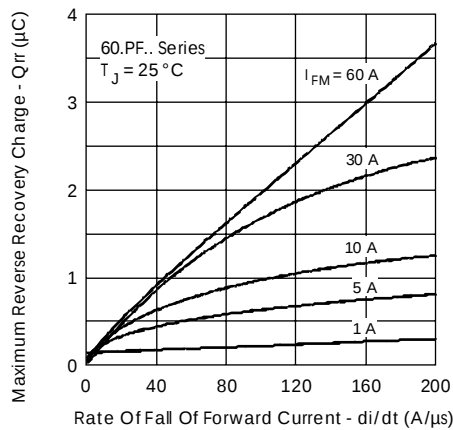


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

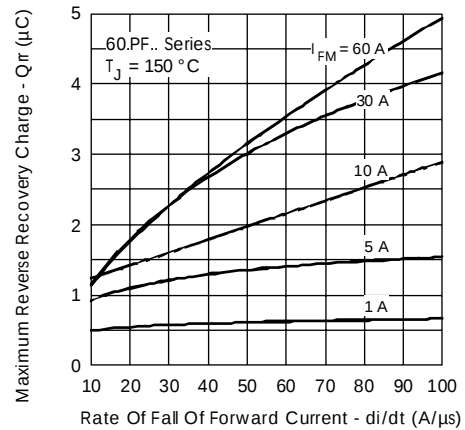


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

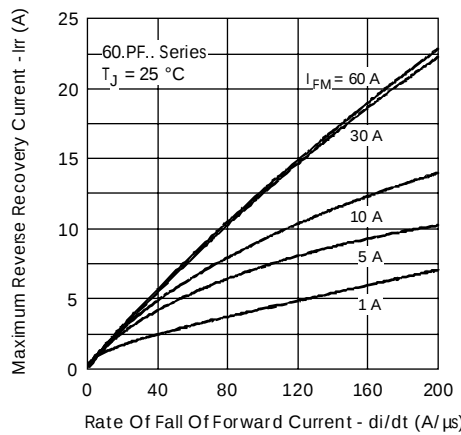


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

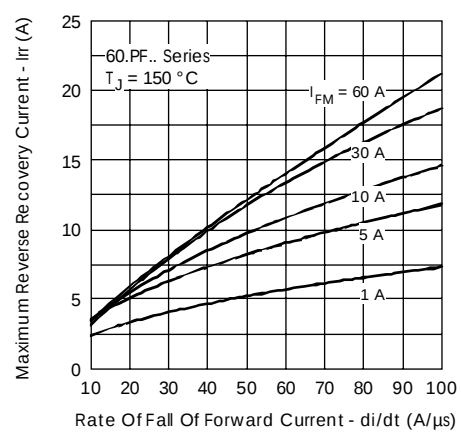


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

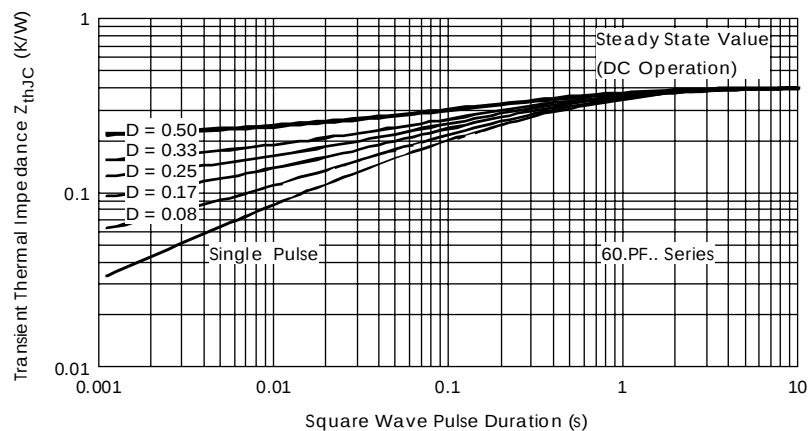


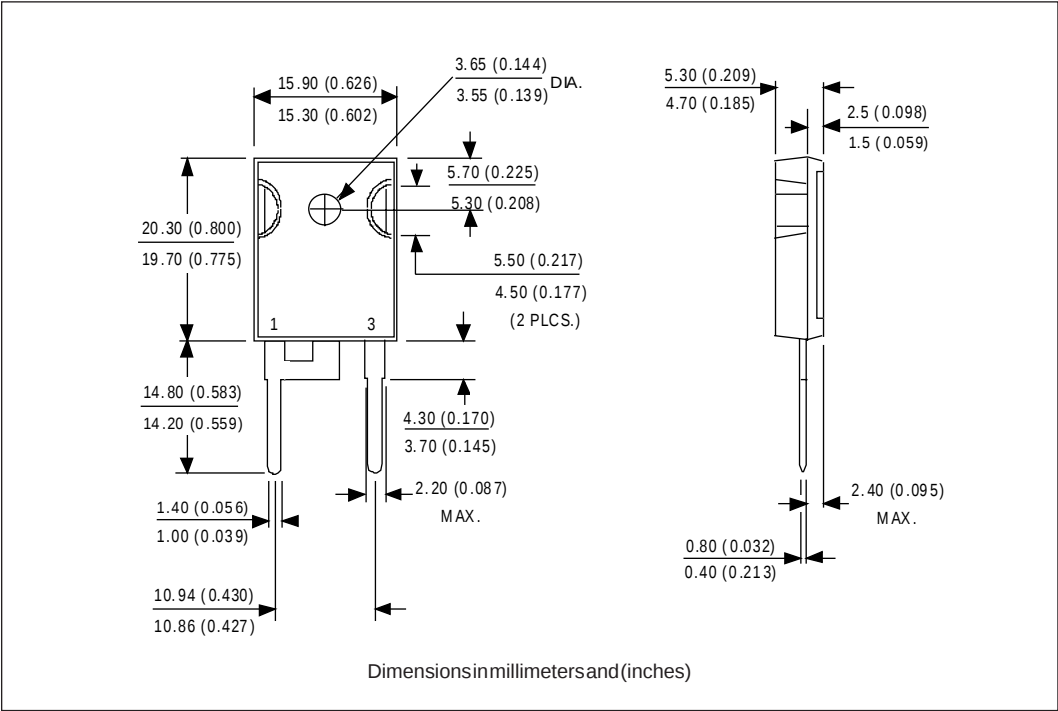
Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

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Outline Table



Ordering Information Table

Device Code				
60	E	P	F	06
1	2	3	4	5

1

-

Current Rating

2

-

Circuit Configuration:
E = Single Diode

3

-

Package:
P = TO-247AC (Modified)

4

-

Type of Silicon:
F = Fast Recovery

5

-

Voltage code: Code x 100 = V_{RRM}

02 = 200V

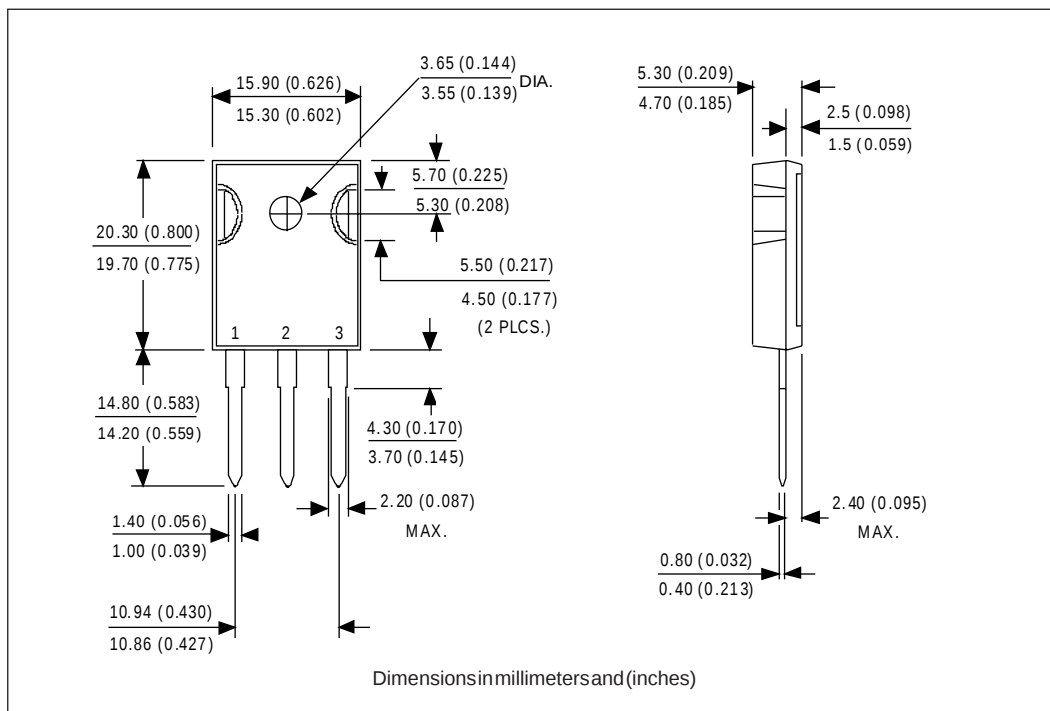
04 = 400V

06 = 600V

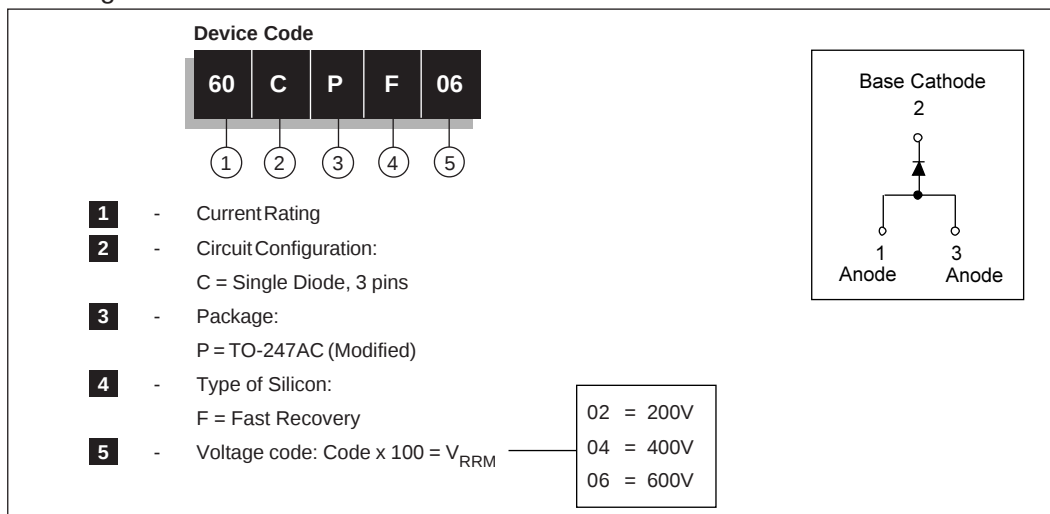
BASE
CATHODE

CATHODE ANODE

Outline Table



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Data and specifications subject to change without notice.