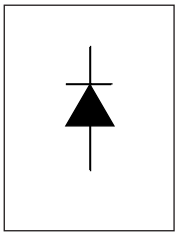
Bulletin I2113 rev. D 04/99

International
IOR Rectifier

*QUIET**IR*** Series
60EPF.. 60CPF..

FAST SOFT RECOVERY RECTIFIER DIODE



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

Description/Features

The 60EPF.. & 60CPF.. fast soft recovery *QUIET**IR*** 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.

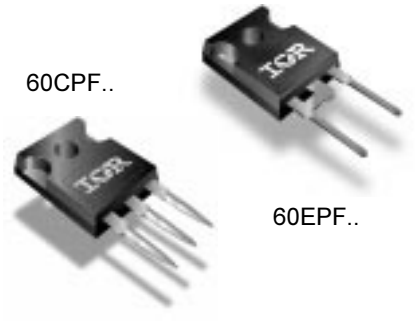
Typical applications are both:

- 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
$I_{F(AV)}$ Sinusoidalwaveform	60	A
V_{RRM}	200 to 600	V
I_{FSM}	830	A
V_F @30A, T_J=25°C	1.1	V
trr @1A, 100A/µs	70	ns
T_J	-40to150	°C

Package Outline



TO-247AC (Modified)

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

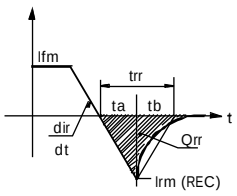
	Parameters	60.PF..	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	60	A	@ T_C = 106°C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive	700	A	10ms Sine pulse, rated V_{RRM} applied
	Surge Current	830		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	2450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

Electrical Specifications

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

Typical Recovery Characteristics

	Parameters	60.PF..	Units	Conditions
t_{rr}	Reverse Recovery Time	180	ns	I_F @ 60Apk
I_{rr}	Reverse Recovery Current	3.4	A	@ 25A/ µs
Q_{rr}	Reverse Recovery Charge	0.5	µC	@ 25°C
S	Snap Factor tb/ta	0.5	typical	



Thermal-Mechanical Specifications

	Parameters		60.PF..	Units	Conditions
T_J	Max. Junction Temperature Range		-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-40 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case		0.4	°C/W	DC operation
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)

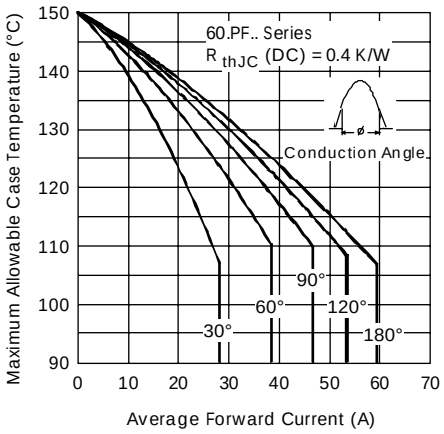


Fig. 1 - Current Rating Characteristics

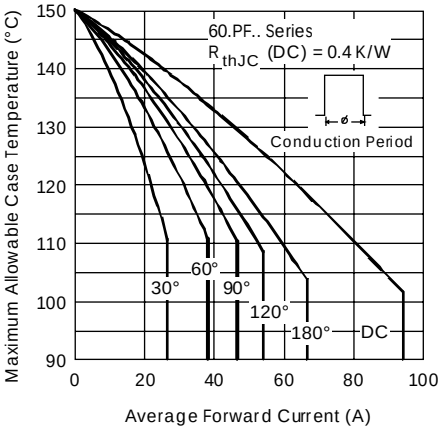


Fig. 2 - Current Rating Characteristics

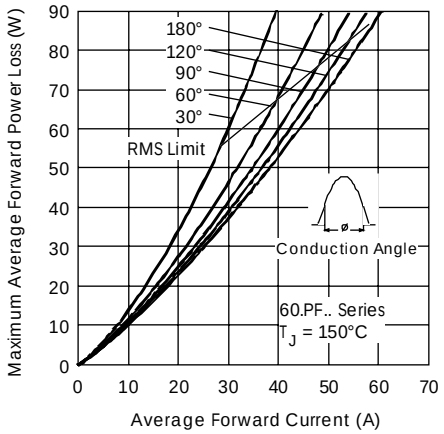


Fig. 3 - Forward Power Loss Characteristics

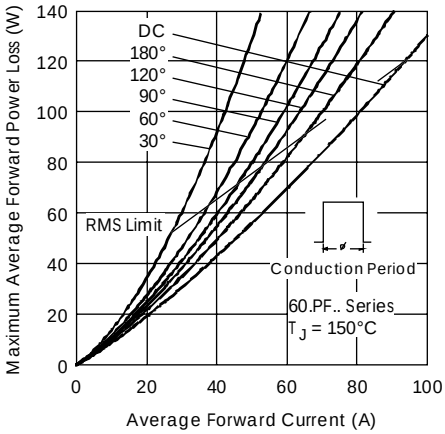


Fig. 4 - Forward Power Loss Characteristics

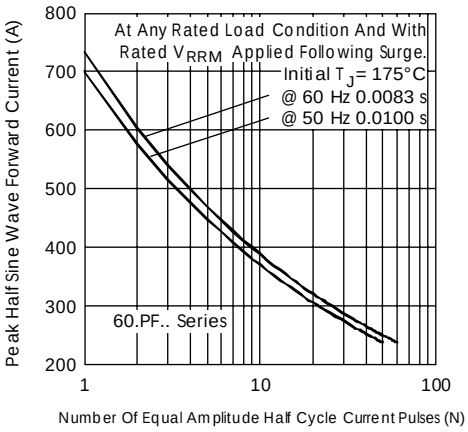


Fig. 5 - Maximum Non-Repetitive Surge Current

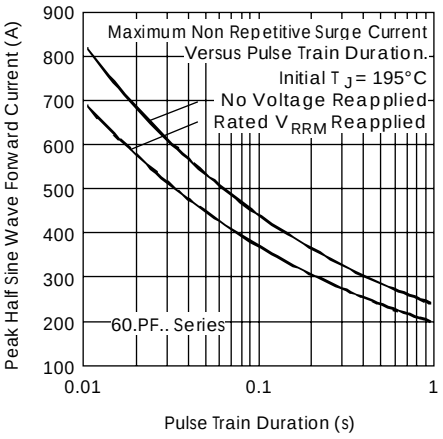


Fig. 6 - Maximum Non-Repetitive Surge Current

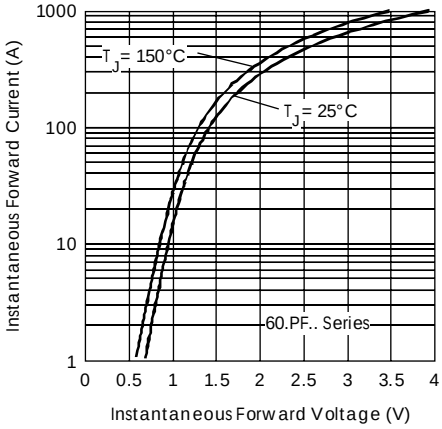


Fig. 7 - Forward Voltage Drop Characteristics

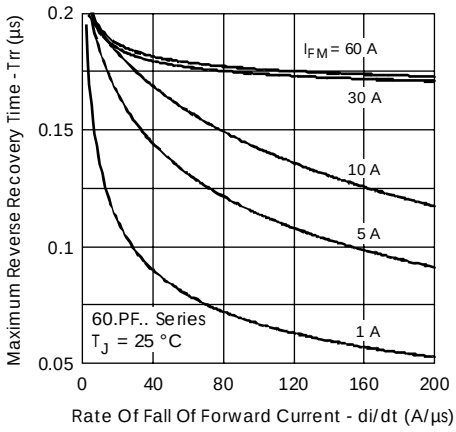


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

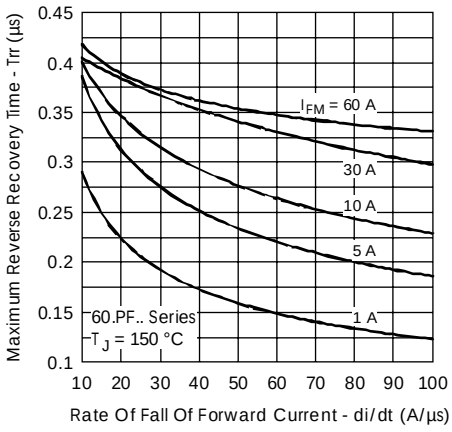


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

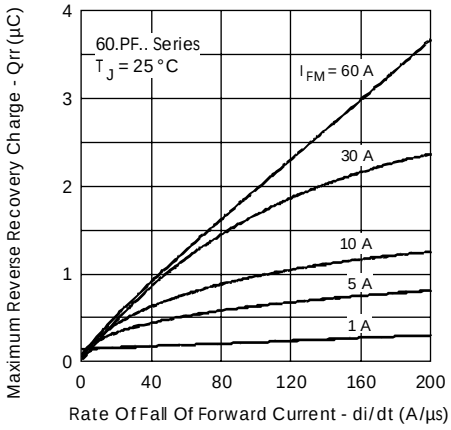


Fig. 10 - Recovery Charge Characteristics, T_J = 25°C

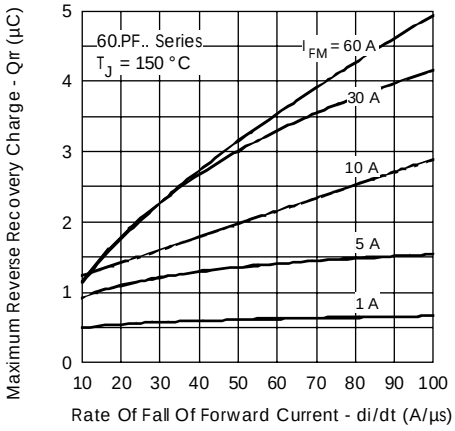


Fig. 11 - Recovery Charge Characteristics, T_J = 150°C

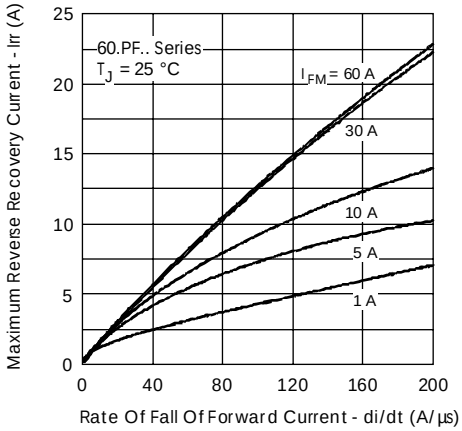


Fig. 12 - Recovery Current Characteristics, T_J = 25°C

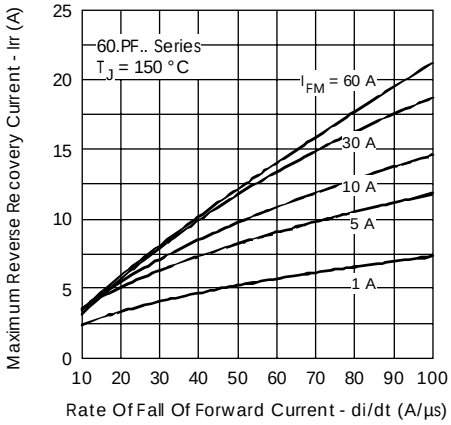


Fig. 13 - Recovery Current Characteristics, T_J = 150°C

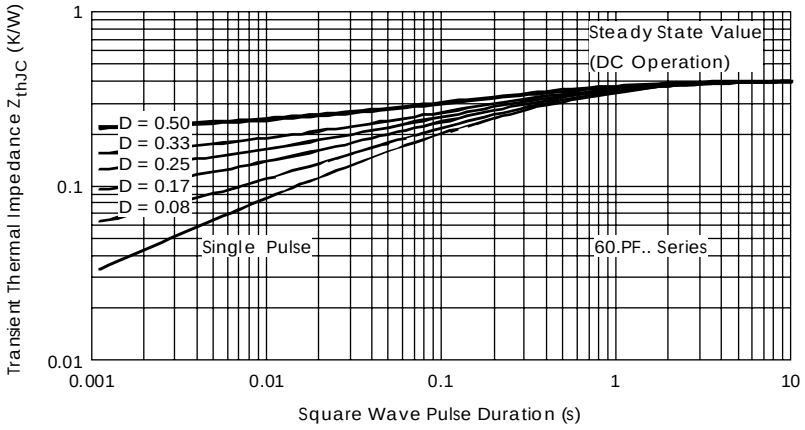
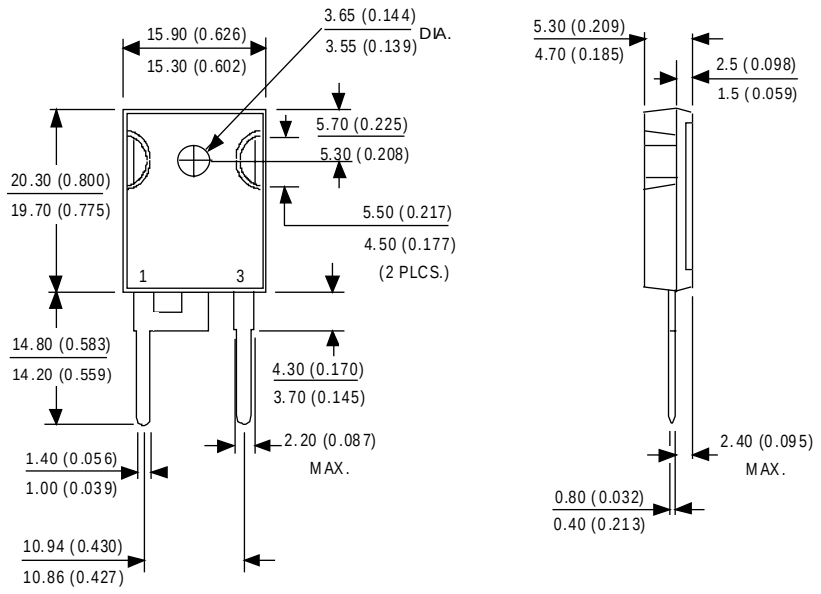


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Outline Table

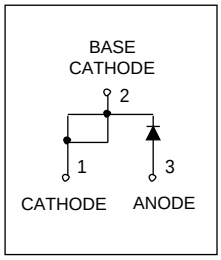


Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

60	E	P	F	06
1	2	3	4	5



1 - Current Rating

2 - Circuit Configuration:
E = Single Diode

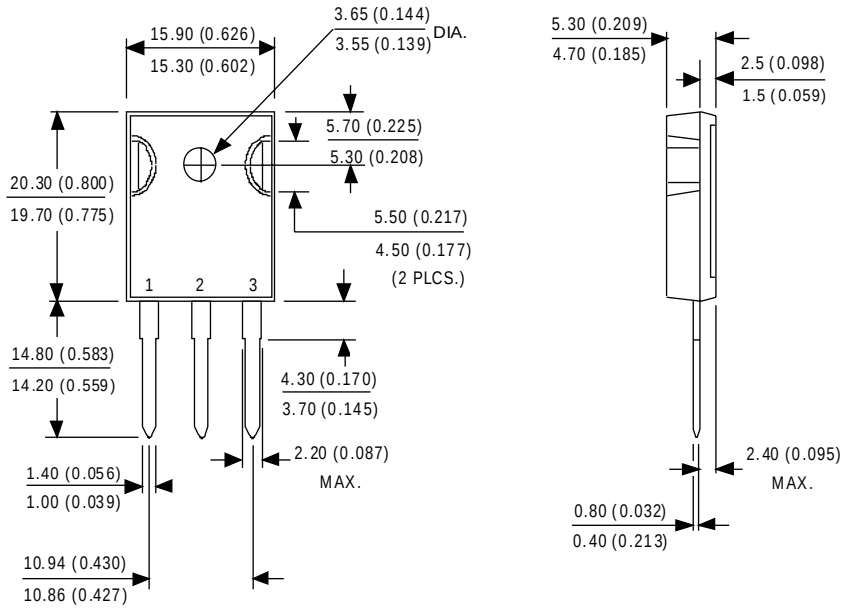
3 - Package:
P = TO-247AC (Modified)

4 - Type of Silicon:
F = Fast Recovery

5 - Voltage code: Code x 100 = V_{RRM}

02	=	200V
04	=	400V
06	=	600V

Outline Table

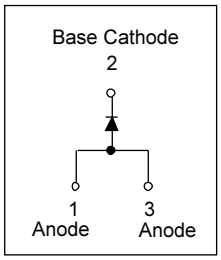


Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

60	C	P	F	06
(1)	(2)	(3)	(4)	(5)



1 - Current Rating

2 - Circuit Configuration:
C = Single Diode, 3 pins

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

International
IOR Rectifier

WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.
EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.
IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
IR SOUTHEAST ASIA: 1 Kim Seng Promenade, Great World City West Tower,13-11, Singapore 237994. Tel: ++ 65 838 4630.
IR TAIWAN: 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.