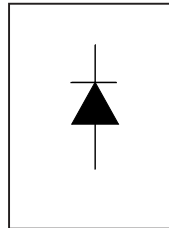


**FAST SOFT RECOVERY  
RECTIFIER DIODE**  
Lead-Free ("PbF" suffix)



$V_F$	< 1.2V @ 10A
$t_{rr}$	= 60ns
$V_{RRM}$	= 600V

**Description/ Features**

The 30EPF06PbF & 30CPF06PbF 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.

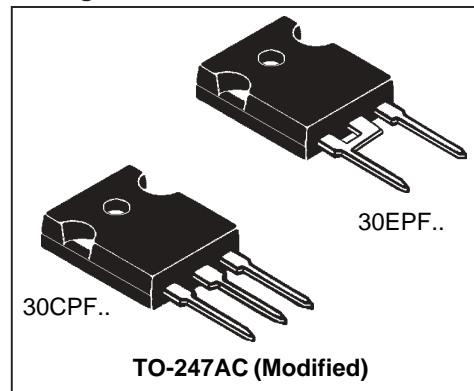
Typical applications are:

- Output rectification and freewheeling in inverters, choppers and converters
- and input rectifications where severe restrictions on conducted EMI should be met.
- 30CPF series is a drop in replacement for 25CPF Series (parallel connection only)

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	30	A
$V_{RRM}$	600	V
$I_{FSM}$	350	A
$V_F$ @ 10A, $T_J=25^\circ\text{C}$	1.2	V
$t_{rr}$ @ 1A, 100A/ $\mu\text{s}$	60	ns
$T_J$	-40 to 150	$^\circ\text{C}$

**Package Outline**



### 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
30EPF06PbF, 30CPF06PbF	600	700	2

### Absolute Maximum Ratings

Parameters	30.PF..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	30	A	@ $T_C = 98^\circ\text{C}$ , $180^\circ$ conduction half sine wave
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	300	A	10ms Sine pulse, rated $V_{RRM}$ applied
	350		10ms Sine pulse, no voltage reapplied
$I^2t$ Max. $I^2t$ for fusing	450	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	636		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	6360	$A^2\sqrt{s}$	$t = 0.1$ to $10\text{ms}$ , no voltage reapplied

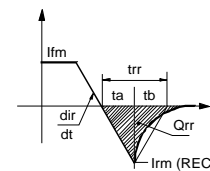
### Electrical Specifications

Parameters	30.PF..	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.41	V	@ 30A, $T_J = 25^\circ\text{C}$
$r_t$ Forward slope resistance	12.5	$m\Omega$	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.9	V	
$I_{RM}$ Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	2.0		$T_J = 150^\circ\text{C}$

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

### Typical Recovery Characteristics

Parameters	30.PF..	Units	Conditions
$t_{rr}$ Reverse Recovery Time	160	ns	$I_F @ 20\text{Apk}$ @ $100\text{A}/\mu\text{s}$ @ $25^\circ\text{C}$
$I_{rr}$ Reverse Recovery Current	10	A	
$Q_{rr}$ Reverse Recovery Charge	1.25	$\mu\text{C}$	
S Snap Factor $t_b/t_a$	0.6	typical	



Thermal-Mechanical Specifications

Parameters		30.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	0.8	°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)
Marking Device		30EPF06/ 30CPF06		

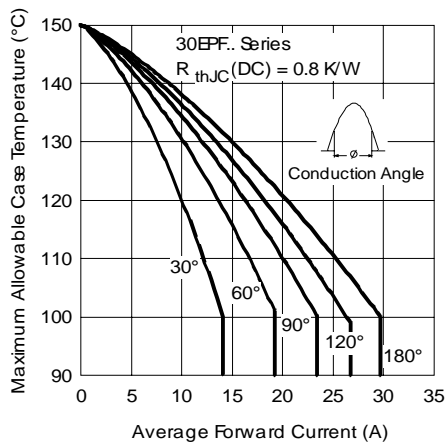


Fig. 1 - Current Rating Characteristics

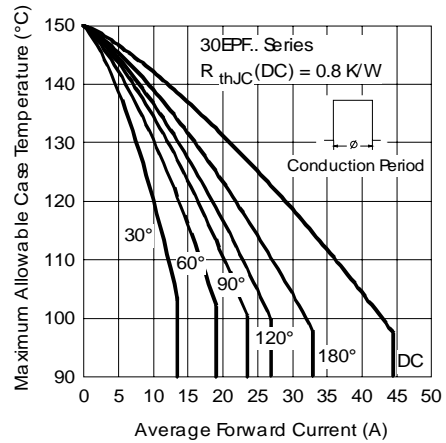


Fig. 2 - Current Rating Characteristics

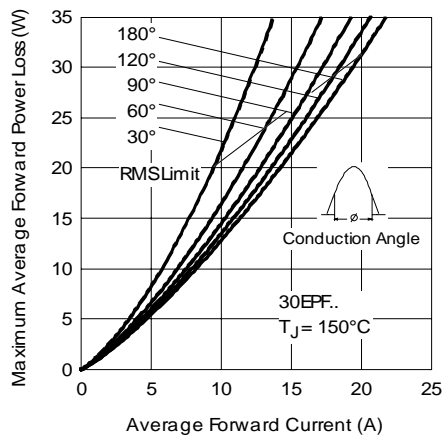


Fig. 3 - Forward Power Loss Characteristics

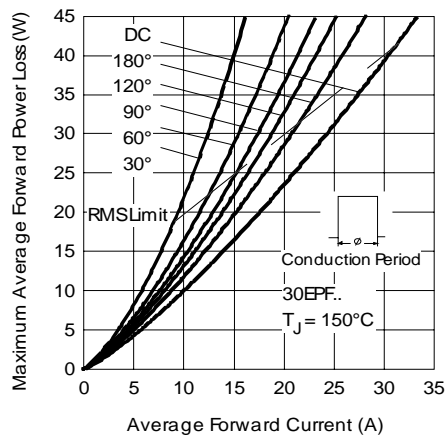


Fig. 4 - Forward Power Loss Characteristics

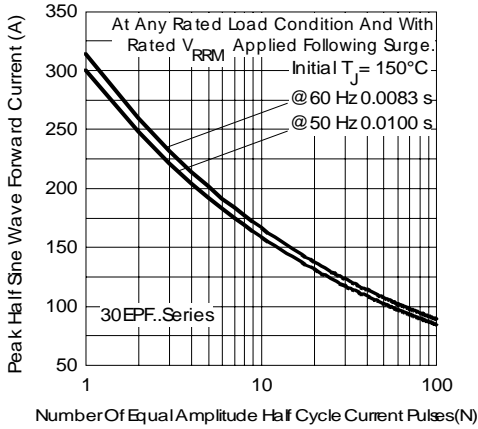


Fig. 5 - Maximum Non-Repetitive Surge Current

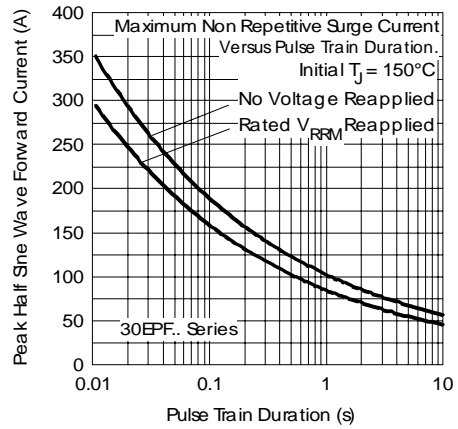


Fig. 6 - Maximum Non-Repetitive Surge Current

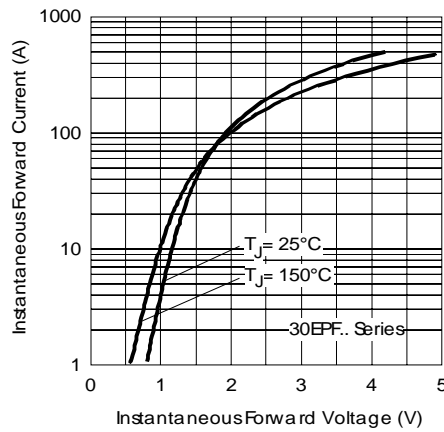


Fig. 7 - Forward Voltage Drop Characteristics

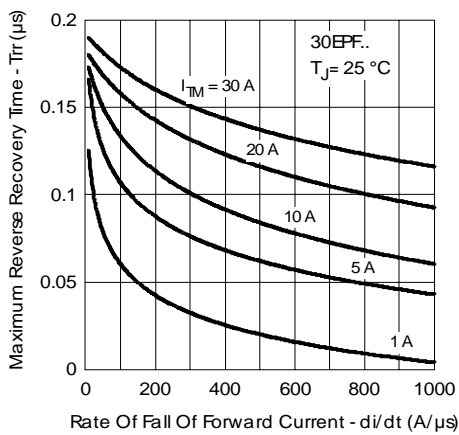


Fig. 8 - Recovery Time Characteristics,  $T_J = 25^\circ\text{C}$

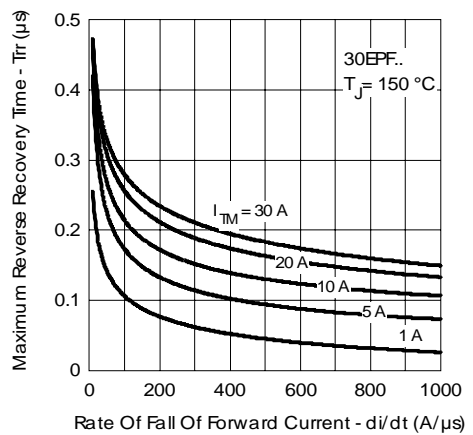


Fig. 9 - Recovery Time Characteristics,  $T_J = 150^\circ\text{C}$

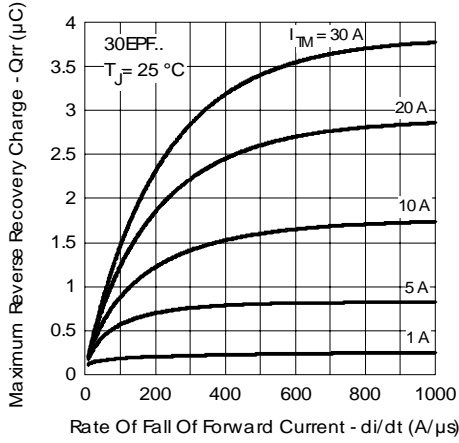


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25^\circ\text{C}$

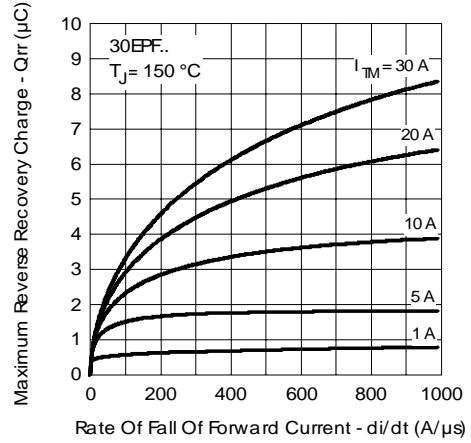


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150^\circ\text{C}$

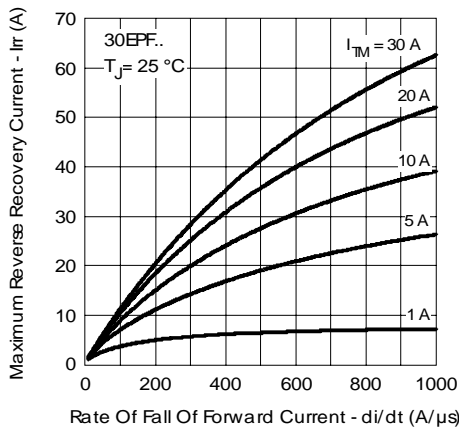


Fig. 12 - Recovery Current Characteristics,  $T_J = 25^\circ\text{C}$

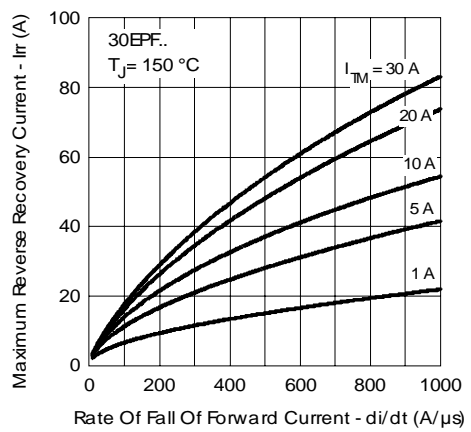


Fig. 13 - Recovery Current Characteristics,  $T_J = 150^\circ\text{C}$

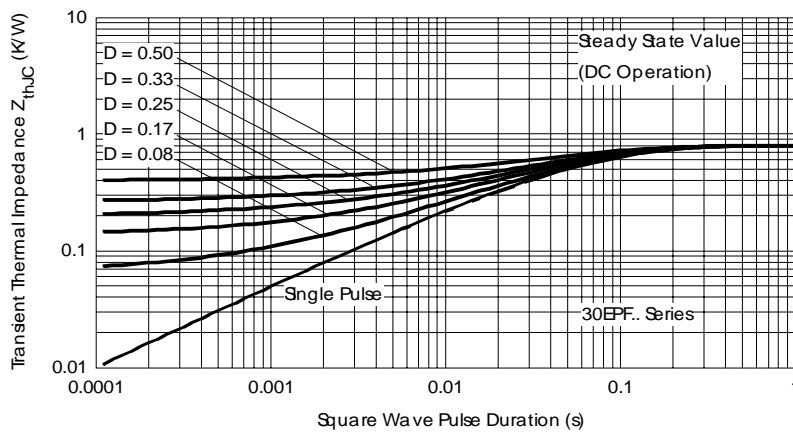
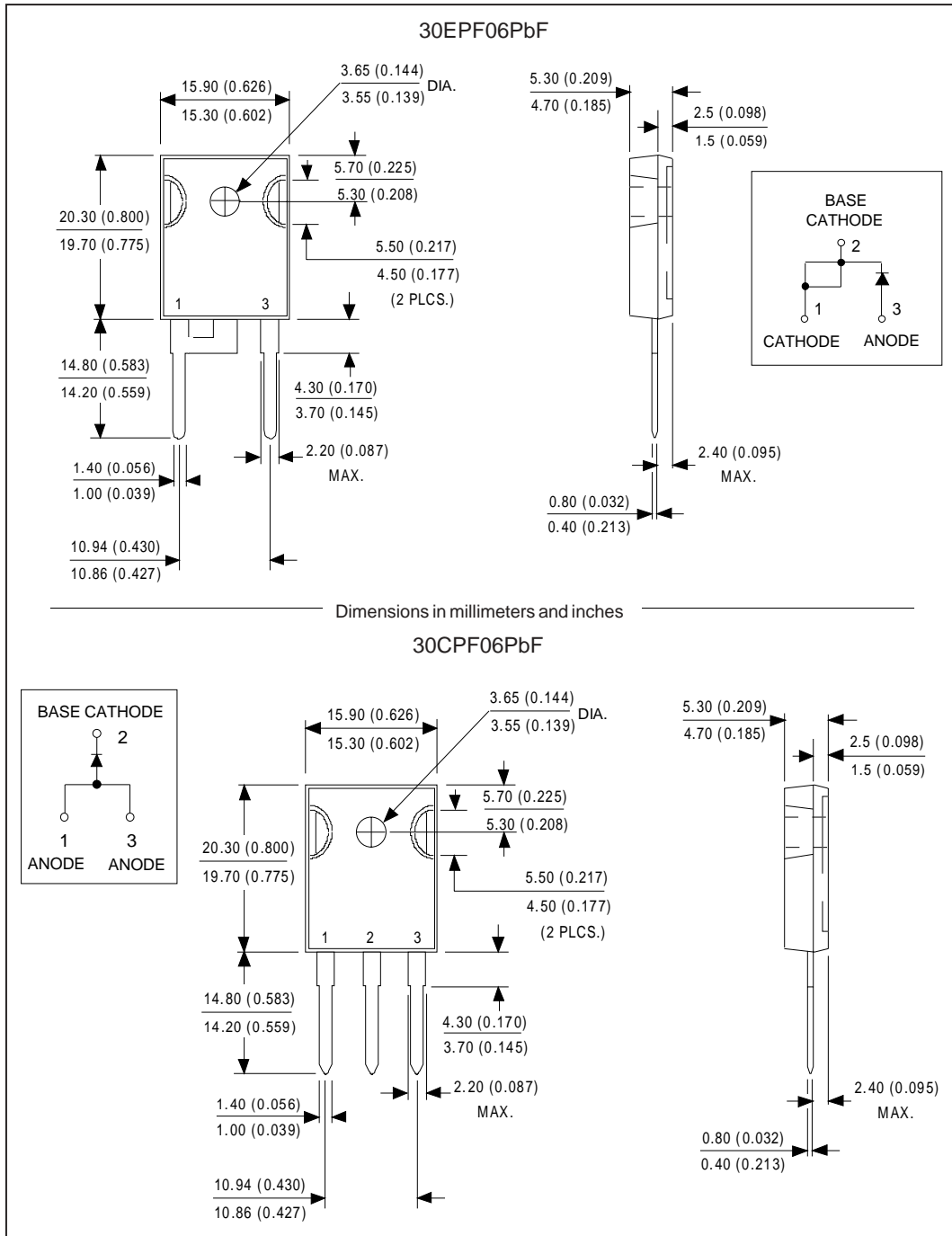


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

Outline Table



### Marking Information

EXAMPLE: THIS IS A 30EPF06  
 WITH ASSEMBLY  
 LOT CODE 5657  
 ASSEMBLED ON WW 35, 2000  
 IN ASSEMBLY LINE "H"

PART NUMBER

DATE CODE  
 P = LEAD-FREE  
 YEAR 0 = 2000  
 WEEK 35  
 LINE H

EXAMPLE: THIS IS A 30CPF06  
 WITH ASSEMBLY  
 LOT CODE 5657  
 ASSEMBLED ON WW 35, 2000  
 IN ASSEMBLY LINE "H"

PART NUMBER

DATE CODE  
 P = LEAD-FREE  
 YEAR 0 = 2000  
 WEEK 35  
 LINE H

### Ordering Information Table

Device Code	30	E	P	F	06	PbF
	①	②	③	④	⑤	⑥
<b>1</b>	- Current Rating (30 = 30A)					
<b>2</b>	- Circuit Configuration: E = Single Diode C = Single Diode, 3 pins					
<b>3</b>	- Package: P = TO-247AC (Modified)					
<b>4</b>	- Type of Silicon: F = Fast Recovery					
<b>5</b>	- Voltage Rating (06 = 600V)					
<b>6</b>	- • none = Standard Production • PbF = Lead-Free					

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.

International  
**IOR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 10/04