

I2153 rev. C 01/2000

International
IR Rectifier

QUIETIR Series
85EPF..HV

FAST SOFT RECOVERY
RECTIFIER DIODE



$I_{F(RMS)}$	= 160A
V_F	< 1.4V @ 100A
t_{rr}	= 95ns
V_{RRM}	800 to 1200V

Major Ratings and Characteristics

Characteristics	85EPF..	Units
$I_{F(AV)}$ Rect. Conduction 50% duty Cycle @ $T_C = 85^\circ C$	85	A
$I_{F(RMS)}$	160	A
V_{RRM} range (*)	800 to 1200	V
I_{FSM}	1100	A
V_F @ 100A, $T_J = 25^\circ C$	1.4	V
t_{rr} @ 1A, -100A/ μs	95	ns
T_J range	-40 to 150	$^\circ C$

Description/Features

The 85EPF.. 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.

Available in the new PowIRtab™ package, this new series is suitable for a large range of applications combining excellent die to footprint ratio and sturdiness connectivity for use in high current environments.

Typical applications are both:

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

Case Styles

85EPF..	85EPF..J

(*) for higher voltage up to 1600V contact factory



85EPF.. HV 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
85EPF08	800	900	15
85EPF10	1000	1100	
85EPF12	1200	1300	

Absolute Maximum Ratings

Parameters	85EPF..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	85	A	@ $T_C = 85^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	1100	A	10ms Sine pulse, rated V_{RRM} applied
	1250		10ms Sine pulse, no voltage reappplied
I^2t Max. I^2t for fusing	5000	A^2s	10ms Sine pulse, rated V_{RRM} applied
	7000		10ms Sine pulse, no voltage reappplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	70000	$\text{A}^2\sqrt{\text{s}}$	$t = 0.1$ to 10ms, no voltage reappplied

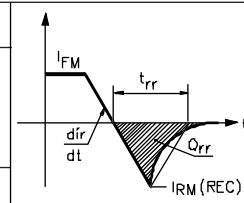
Electrical Specifications

Parameters	85EPF..	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.36	V	@ 85A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	4.03	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.87	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	15		$T_J = 150^\circ\text{C}$

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

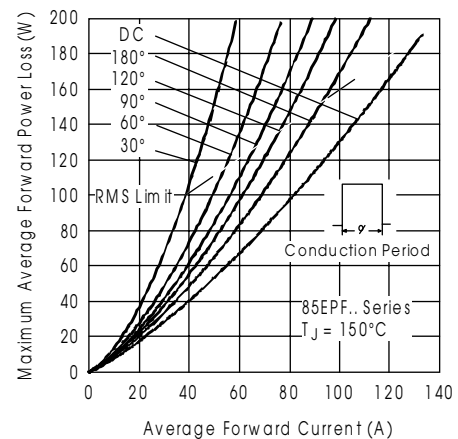
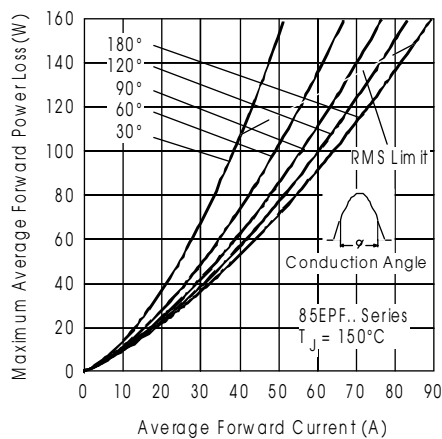
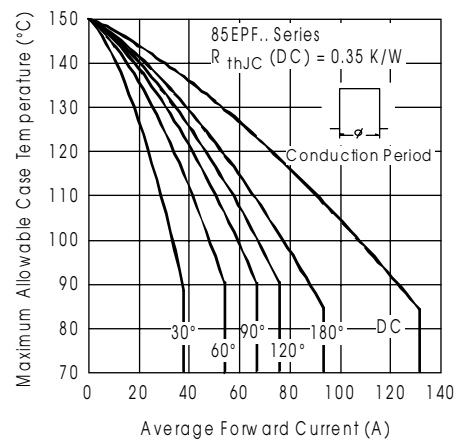
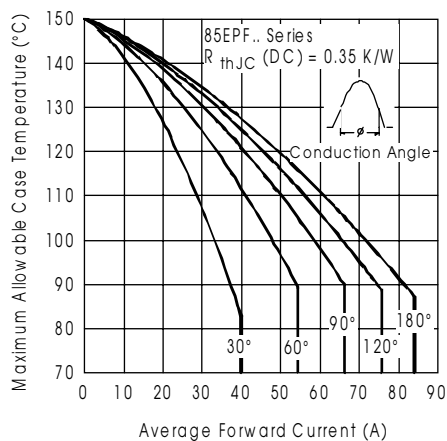
Recovery Characteristics

Parameters	85EPF..	Units	Conditions
t_{rr} Reverse Recovery Time	480	ns	$I_F @ 85\text{Apk}$ $@ 25\text{A}/\mu\text{s}$ $@ 25^\circ\text{C}$
I_{rr} Reverse Recovery Current	7.1	A	
Q_{rr} Reverse Recovery Charge	2.1	μC	
S Snap Factor	0.5		



Thermal-Mechanical Specifications

Parameters	85EPF..	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	0.35	°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



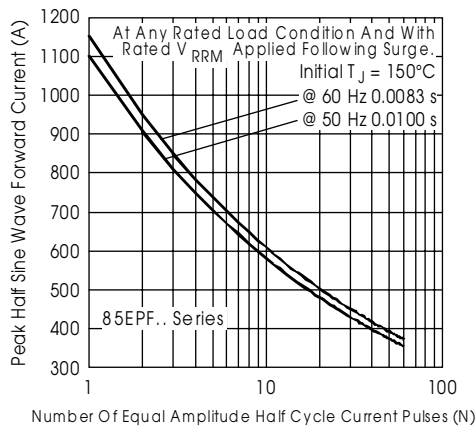


Fig. 5 - Maximum Non-Repetitive Surge Current

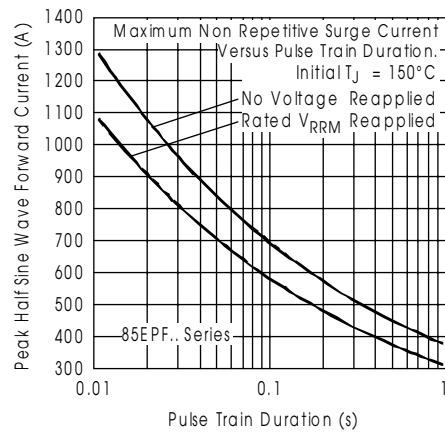


Fig. 6 - Maximum Non-Repetitive Surge Current

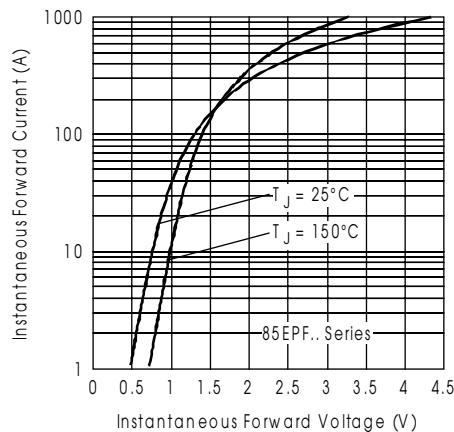


Fig. 7 - Forward Voltage Drop Characteristics

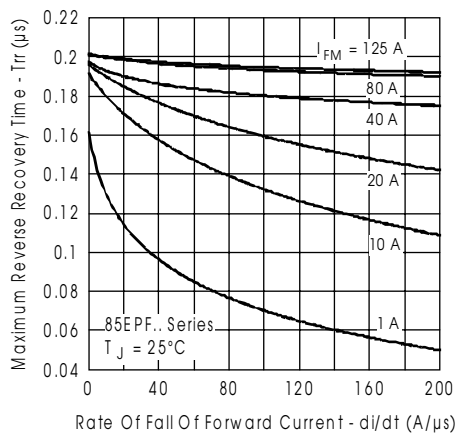


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

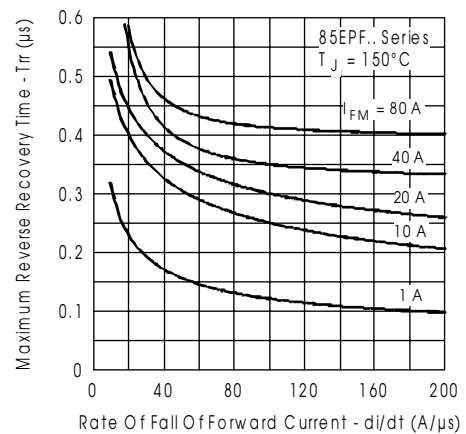


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

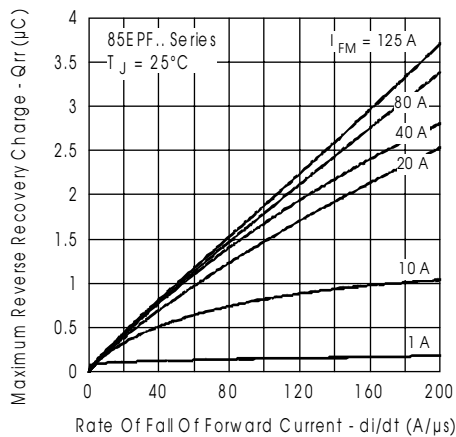


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

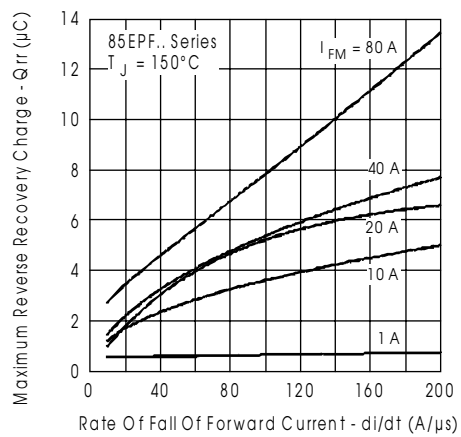


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

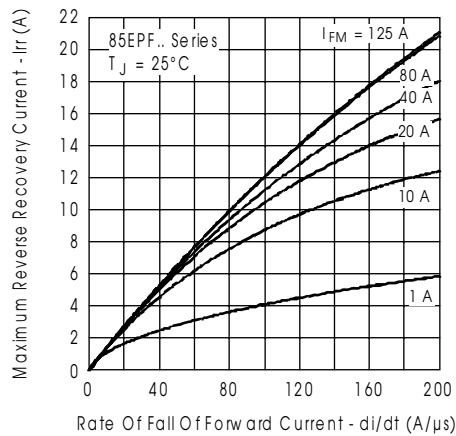


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

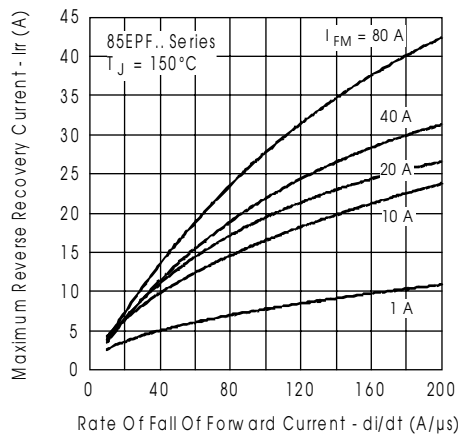


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

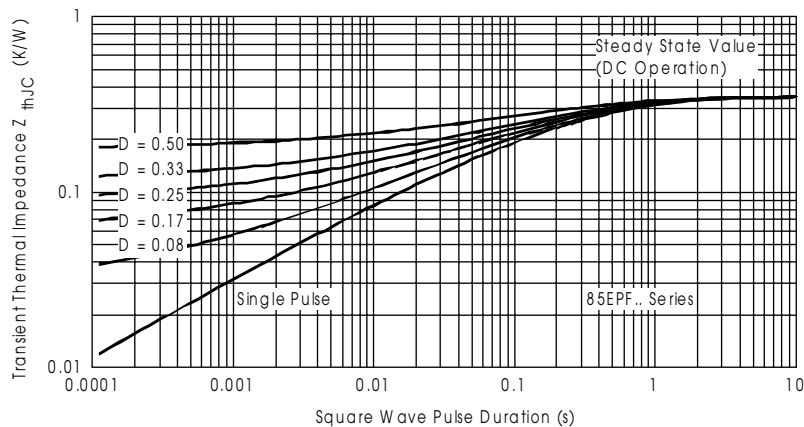


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

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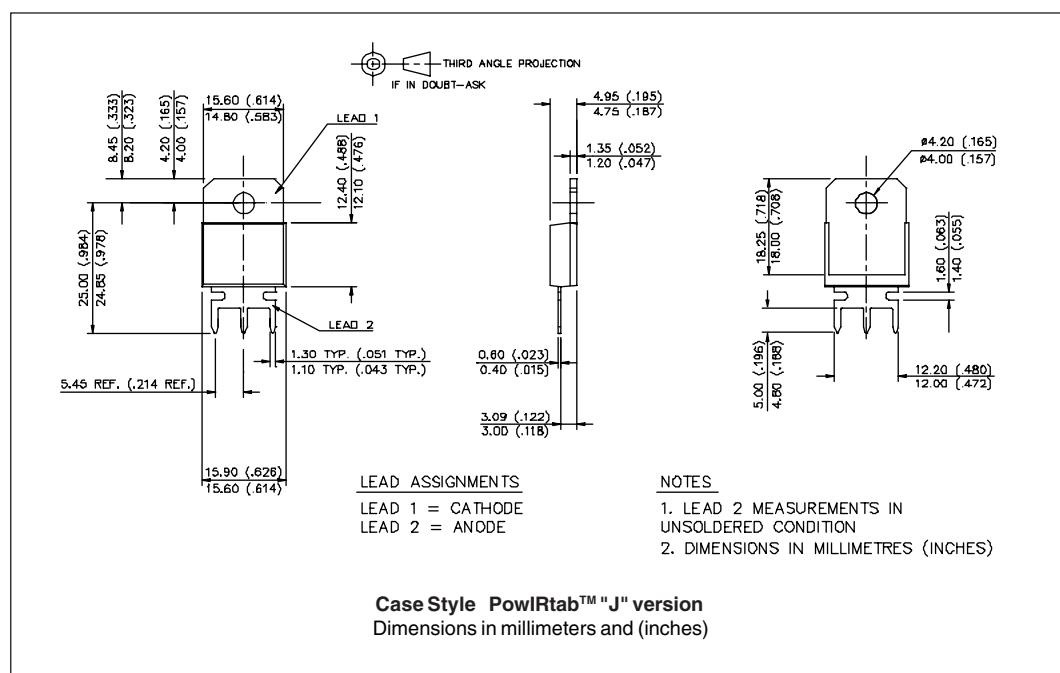
THIRD ANGLE PROJECTION
IF IN DOUBT-ASK

15.90 (.626)
15.60 (.614)
15.60 (.614)
14.80 (.583)
LEAD 1
12.40 (.488)
12.10 (.476)
8.45 (.333)
8.20 (.323)
4.20 (.165)
4.00 (.157)
LEAD 2
Ø4.20 (.165)
Ø4.00 (.157)
5.45 REF. (.214 REF.)
5.20 (.205)
4.95 (.194)
4.95 (.195)
4.75 (.187)
1.35 (.052)
1.20 (.047)
3.09 (.122)
3.00 (.118)
0.60 (.023)
0.40 (.015)
18.25 (.718)
16.00 (.706)
Ø4.20 (.165)
Ø4.00 (.157)
27.65 (1.088)
27.25 (1.072)
39.8 (1.566)
39.6 (1.558)
1.30 (.051)
1.10 (.043)
12.20 (.480)
12.00 (.472)

LEAD ASSIGNMENTS
LEAD 1 = CATHODE
LEAD 2 = ANODE

NOTES
DIMENSIONS IN MILLIMETERS (INCHES)

Case Style PowlRtab™
Dimensions in millimeters and (inches)



Ordering Information Table

Device Code					
85	E	P	F	12	J
1	2	3	4	5	6
1	Current Rating				
2	Circuit Configuration:				
	E = Single Diode				
3	Package:				
	P = TO-247AC				
4	Type of Silicon:				
	F = Fast Recovery				
5	Voltage code: Code x 100 = V_{RRM} (*)				
6	none=PowIRtab™ standard				
	J = Short Lead Version				

08 = 800V
10 = 1000V
12 = 1200V

Base Cathode
2

1 Anode 3 Anode

(*) for higher voltage up to 1600V contact factory