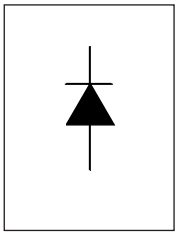
Bulletin I2129 rev. A 06/98

International
IOR Rectifier

*QUIET**IR*** Series
40EPF.. HV

FAST SOFT RECOVERY RECTIFIER DIODE



V_F < 1.25V @ 20A
t_{rr} = 95 ns
V_{RRM} 1000 to 1200V

Description/Features

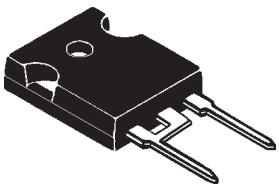
The 40EPF.. fast soft recovery *QUIET**IR*** rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.
The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

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	40EPF..	Units
$I_{F(AV)}$ Sinusoidal waveform	40	A
V_{RRM}	1000 to 1200	V
I_{FSM}	475	A
V_F @20A, T_J = 25°C	1.25	V
trr @1A, -100A/µs	95	ns
T_J	-40 to 150	°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
40EPF10	1000	1100	10
40EPF12	1200	1300	

Absolute Maximum Ratings

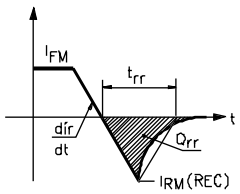
	Parameters	40EPF..	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	40	A	@ T_C = 105° C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive	400	A	10ms Sine pulse, rated V_{RRM} applied
	Surge Current	475		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	800	A^2s	10ms Sine pulse, rated V_{RRM} applied
		1131		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	11310	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied

Electrical Specifications

	Parameters	40EPF..	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	1.4	V	@ 40A, T_J = 25°C	
r_t	Forward slope resistance	6.82	mΩ	T_J = 125°C	
$V_{F(TO)}$	Threshold voltage	0.94	V		
I_{RM}	Max. Reverse Leakage Current	0.1	mA	T_J = 25 °C	V_R = rated V_{RRM}
		10		T_J = 150 °C	

Recovery Characteristics

	Parameters	40EPF..	Units	Conditions
t_{rr}	Reverse Recovery Time	450	ns	I_F @ 10Apk
I_{rr}	Reverse Recovery Current	6	A	@ 25A/ µs
Q_{rr}	Reverse Recovery Charge	1.8	µC	@ 25°C
S	Typical Snap Factor	0.5		



Thermal-Mechanical Specifications

	Parameters		40EPF..	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		0.6	°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)

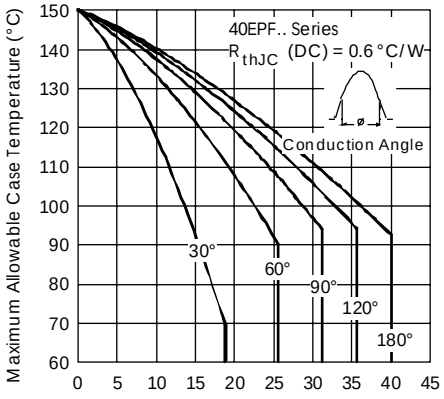


Fig.1-CurrentRatingCharacteristics

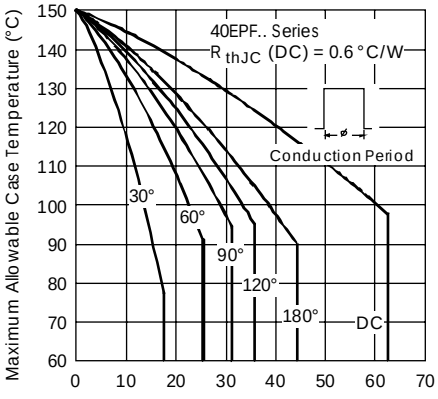


Fig.2-CurrentRatingCharacteristics

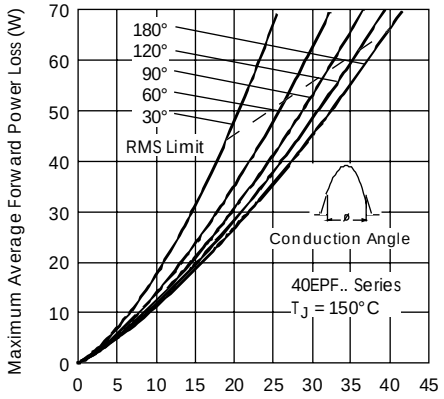


Fig.3-ForwardPowerLossCharacteristics

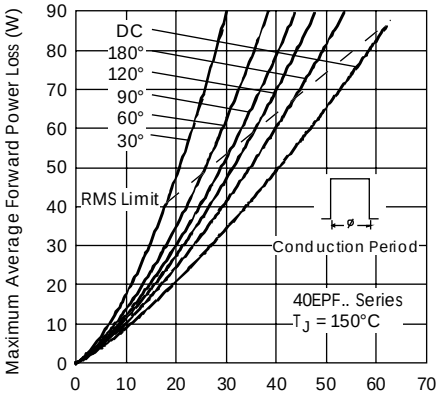


Fig.4-ForwardPowerLossCharacteristics

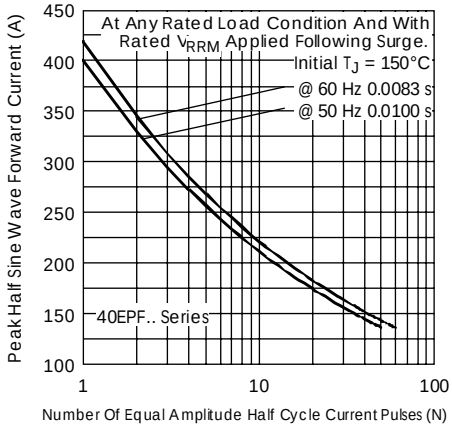


Fig. 5 - Maximum Non-Repetitive Surge Current

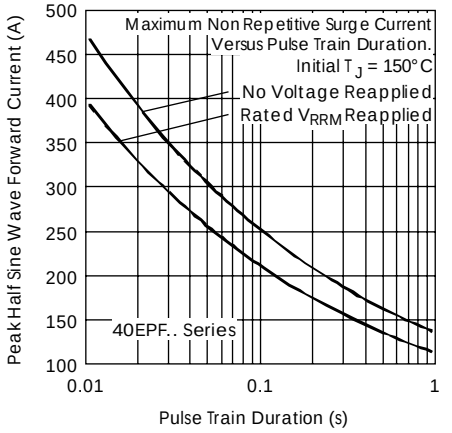


Fig. 6 - Maximum Non-Repetitive Surge Current

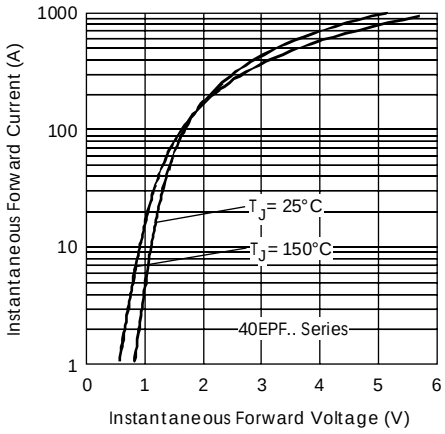


Fig. 7 - Forward Voltage Drop Characteristics

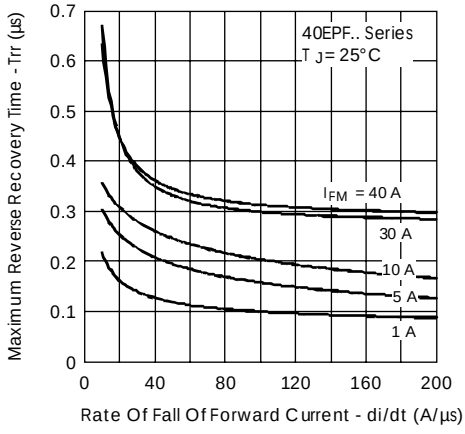


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

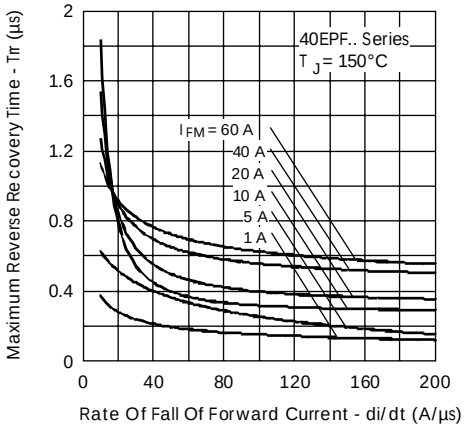


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

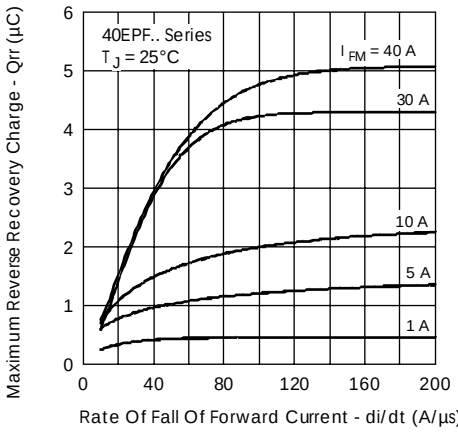


Fig. 10 - Recovery Charge Characteristics, T_J=25°C

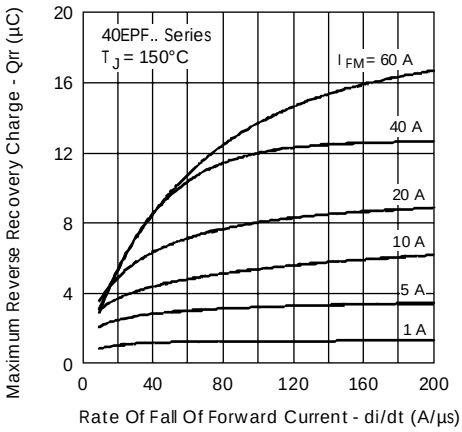


Fig. 11 - Recovery Charge Characteristics, T_J=150°C

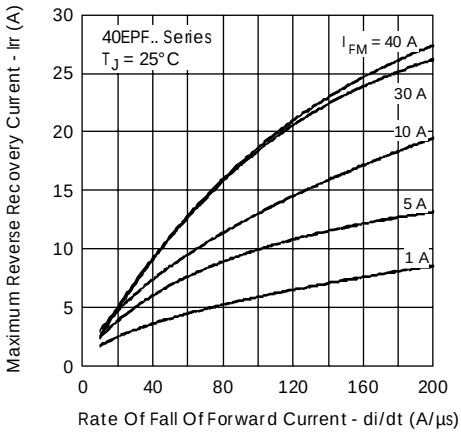


Fig. 12 - Recovery Current Characteristics, T_J=25°C

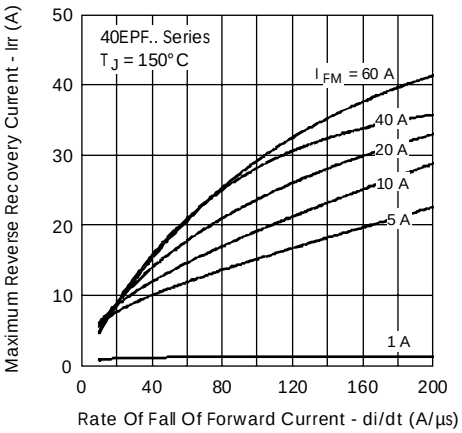


Fig. 13 - Recovery Current Characteristics, T_J=150°C

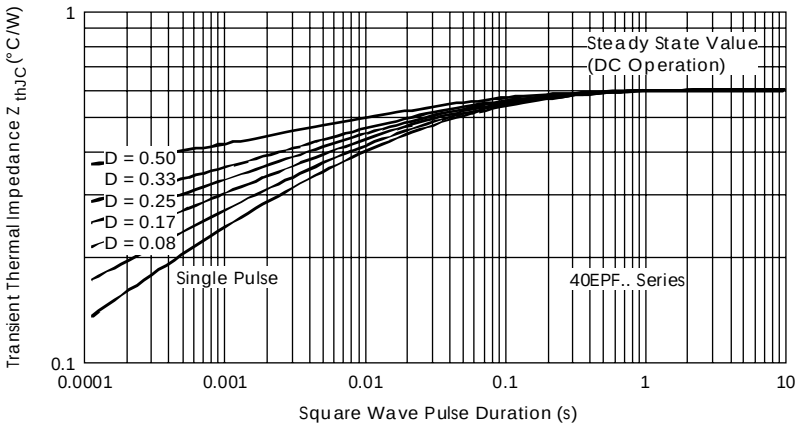
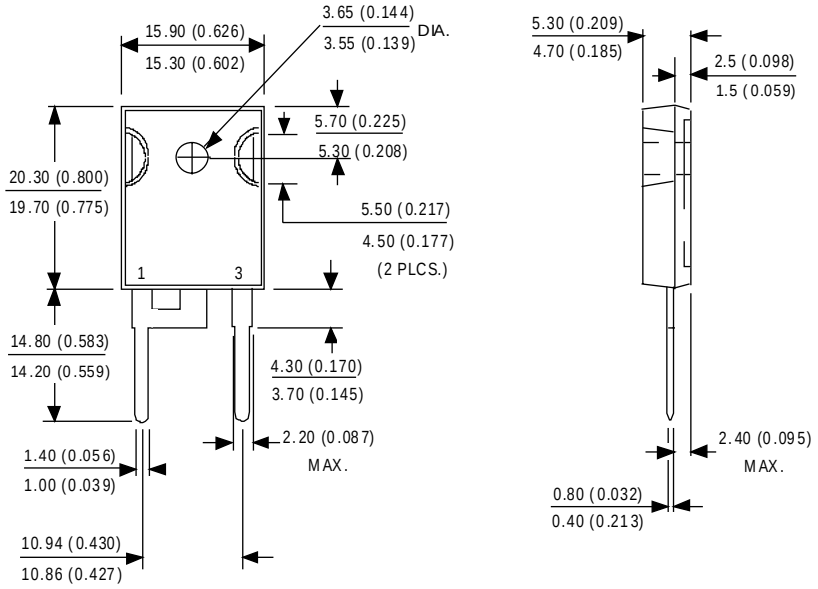


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Outline Table

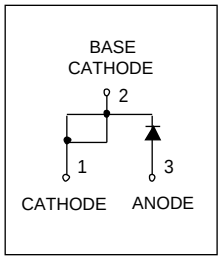


Dimensions in millimeters and inches

Ordering Information Table

Device Code

40	E	P	F	12
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}

10	=	1000V
12	=	1200V