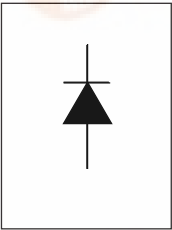


Bulletin I2119 rev. C 03/99

International
IR Rectifier

QUIETIR Series
20ETF..FP

FAST SOFT RECOVERY
RECTIFIER DIODE
TO-220 FULLPAK



V_F	$< 1.2V @ 10A$
I_{FSM}	$= 300A$
V_{RRM}	200 to 600V

Description/Features

The 20ETF.. FP 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:

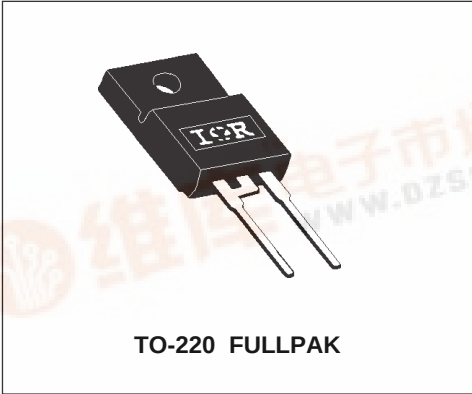
- output rectification and freewheeling in inverters, choppers and converters
- and input rectifications where severe restrictions on conducted EMI should be met
- fully isolated package ($V_{INS} = 2500 V_{RMS}$)

UL E78996 approved 

Major Ratings and Characteristics

Characteristics	20ETF..FP	Units
$I_{F(AV)}$ Sinusoidal waveform	20	A
V_{RRM}	200to 600	V
I_{FSM}	300	A
$V_F @ 10A, T_J = 25^{\circ}C$	1.2	V
$t_{rr} @ 1A, 100A/\mu s$	60	ns
T_J	-40to150	$^{\circ}C$

Package Outline



TO-220 FULLPAK



20ETF..FP QUIET^{IR} 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
20ETF02FP	200	300	5
20ETF04FP	400	500	
20ETF06FP	600	700	

Absolute Maximum Ratings

Parameters	20ETF..FP	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	20	A	@ $T_C = 94^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	250	A	10ms Sine pulse, rated V_{RRM} applied
	300		10ms Sine pulse, no voltage reappplied
I^2t Max. I^2t for fusing	316	A^2s	10ms Sine pulse, rated V_{RRM} applied
	442		10ms Sine pulse, no voltage reappplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	4420	$A^2\sqrt{s}$	$t = 0.1$ to 10ms , no voltage reappplied

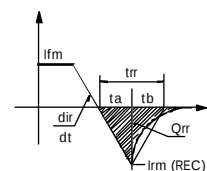
Electrical Specifications

Parameters	20ETF..FP	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.30	V	@ 20A, $T_J = 25^\circ\text{C}$
	1.67	V	@ 60A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	12.5	mΩ	
$V_{F(TO)}$ Threshold voltage	0.9	V	$T_J = 150^\circ\text{C}$
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	5.0	mA	$T_J = 150^\circ\text{C}$

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

Recovery Characteristics

Parameters	20ETF..FP	Units	Conditions
t_{rr} Reverse Recovery Time	160	ns	$I_F @ 20\text{Apk}$ @ 100A/μs @ 25°C
I_{rr} Reverse Recovery Current	10	A	
Q_{rr} Reverse Recovery Charge	1.25	μC	
S Snap Factor t_b/t_a	0.6	typical	



Thermal-Mechanical Specifications

Parameters	20ETF..FP	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	1.5	°C/W	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient	62	°C/W	
R_{thCS} Typical Thermal Resistance Case to Heatsink	1.5	°C/W	Mounting surface, smooth and greased
wt Approximate Weight	2(0.07)	g(oz.)	
T Mounting Torque	Min.	6(5)	Kg-cm (lbf-in)
	Max.	12(10)	
Case Style	TO-220FULLPAK		

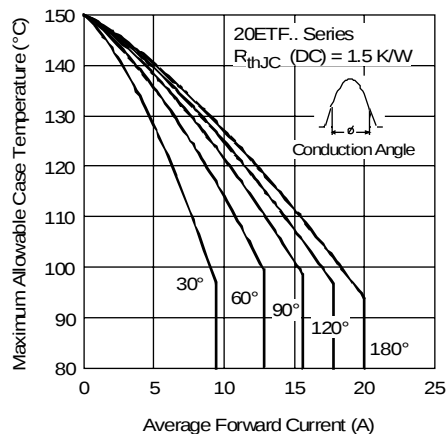


Fig. 1 - Current Rating Characteristics

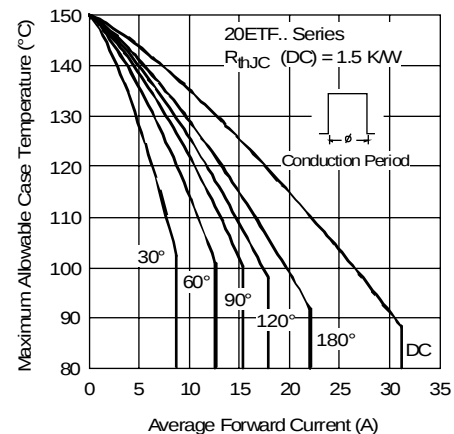


Fig. 2 - Current Rating Characteristics

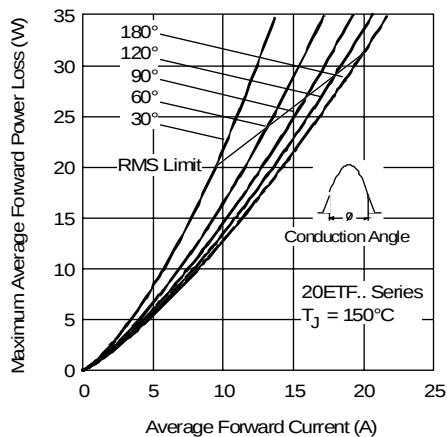


Fig. 3 - Forward Power Loss Characteristics

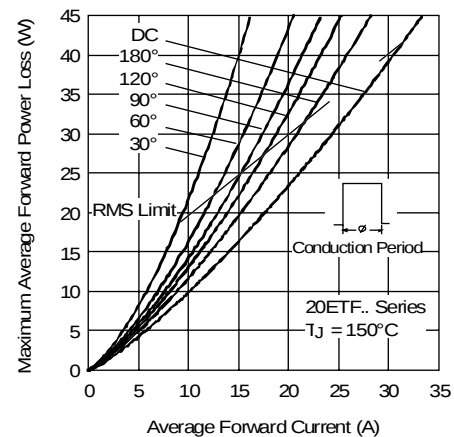


Fig. 4 - Forward Power Loss Characteristics

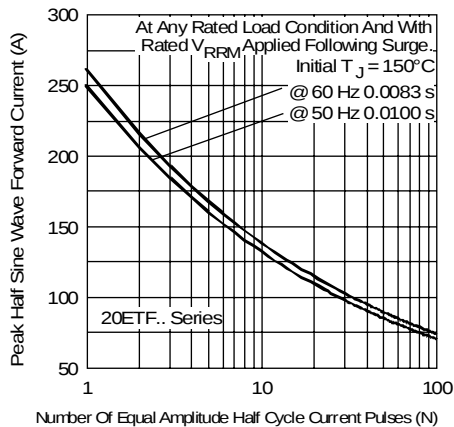


Fig. 5 - Maximum Non-Repetitive Surge Current

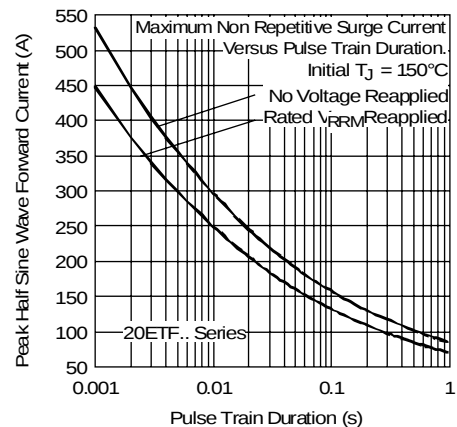


Fig. 6 - Maximum Non-Repetitive Surge Current

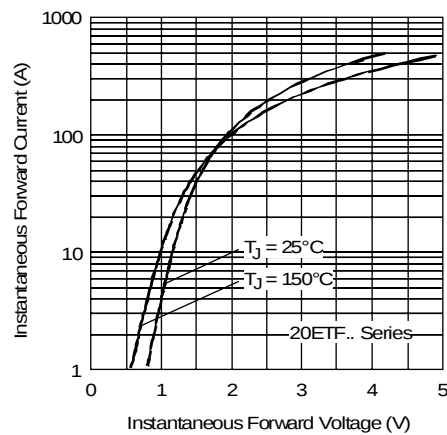


Fig. 7 - Forward Voltage Drop Characteristics

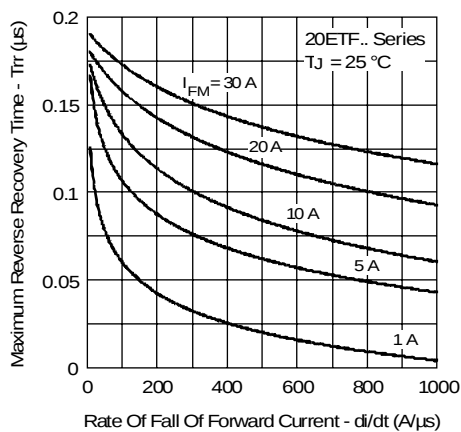


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

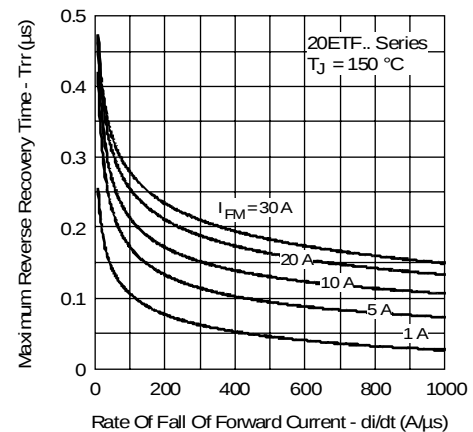


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

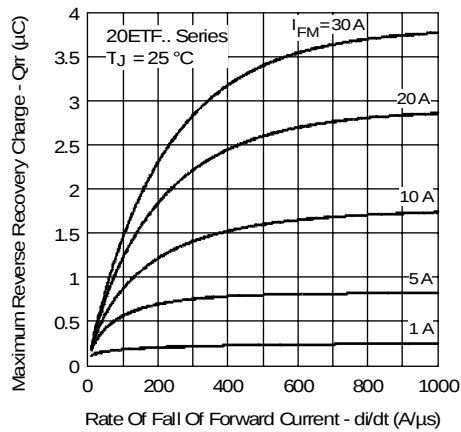


Fig. 10 - Recovery Charge Characteristics, $T_j = 25^\circ\text{C}$

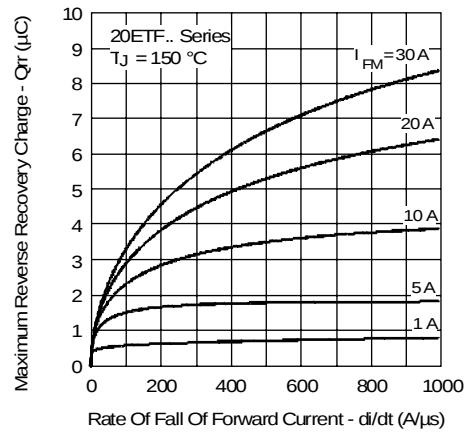


Fig. 11 - Recovery Charge Characteristics, $T_j = 150^\circ\text{C}$

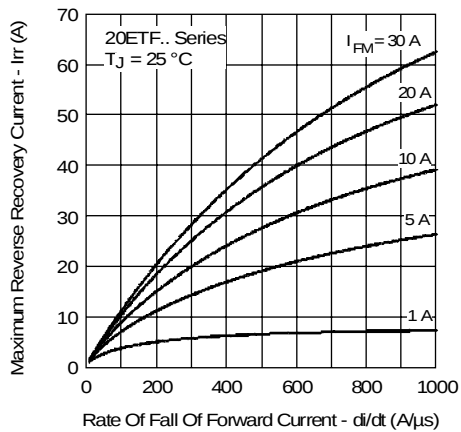


Fig. 12 - Recovery Current Characteristics, $T_j = 25^\circ\text{C}$

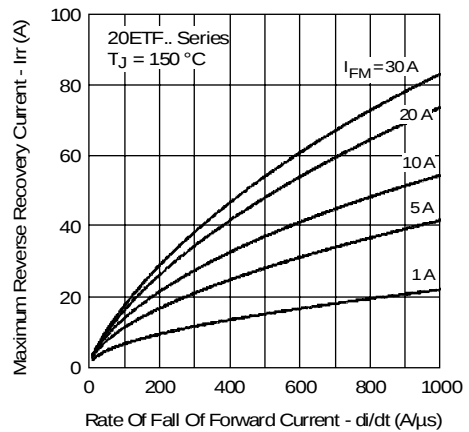


Fig. 13 - Recovery Current Characteristics, $T_j = 150^\circ\text{C}$

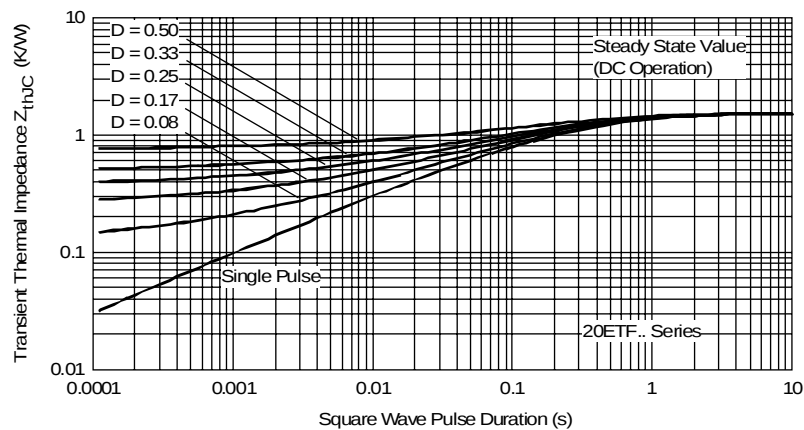


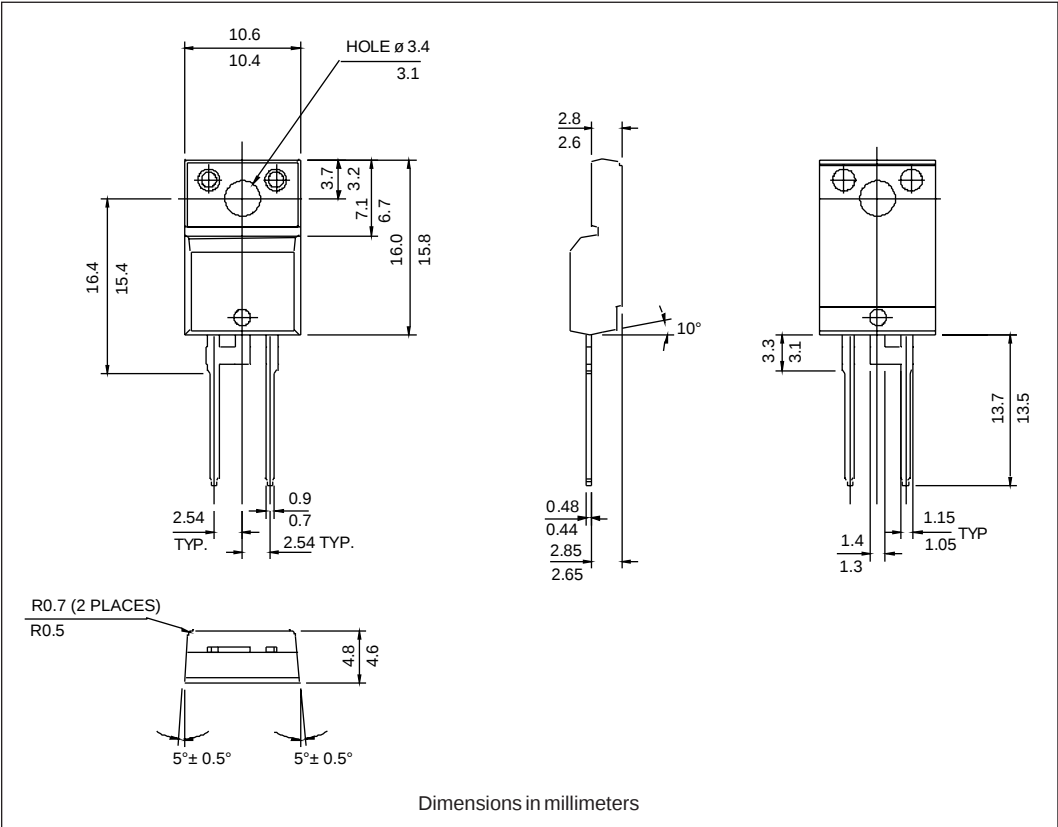
Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

20ETF.FP QUIETIR Series

Bulletin I2119 rev. C 03/99

International
IR Rectifier

Outline Table



Ordering Information Table

Device Code					
20	E	T	F	06	FP
1	2	3	4	5	6
1	-	Current Rating			
2	-	Circuit Configuration:			
		E = Single Diode			
3	-	Package:			
		T = TO-220AC			
4	-	Type of Silicon:			
		F = Fast diode			
5	-	Voltage code: Code x 100 = V_{RRM}			
6	-	TO-220FULLPAK			
				02 = 200V	
				04 = 400V	
				06 = 600V	

CATHODE ANODE

