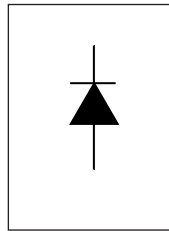


International  
**IR** Rectifier

**QUIETIR** Series  
20ETF..

## FAST SOFT RECOVERY RECTIFIER DIODE



$$V_F < 1.2V @ 10A$$

$$I_{FSM} = 300A$$

$$V_{RRM} 200 \text{ to } 600V$$

### Description/Features

The 20ETF.. 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.

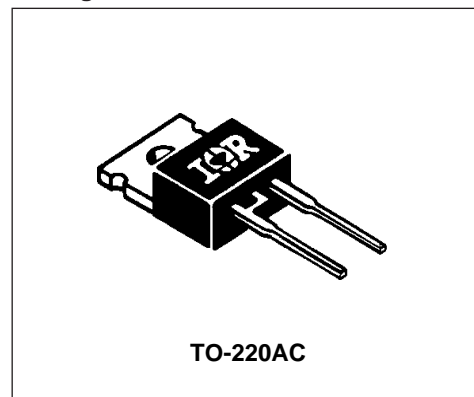
Typical applications are both:

- 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	20ETF..	Units
$I_{F(AV)}$ Sinusoidal waveform	20	A
$V_{RRM}$ range	200 to 600	V
$I_{FSM}$	300	A
$V_F$ @ 10A, $T_J = 25^\circ C$	1.2	V
trr @ 1A, 100A/ $\mu s$	60	ns
$T_J$ range	-40 to 150	$^\circ C$

### 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
20ETF02	200	300	5
20ETF04	400	500	
20ETF06	600	700	

Absolute Maximum Ratings

Parameters	20ETF..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	20	A	@ $T_c = 97^\circ\text{C}$ , 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 reapplied
$I^2t$ Max. $I^2t$ for fusing	316	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	442		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	4420	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

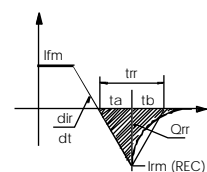
Electrical Specifications

Parameters	20ETF..	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.3	V	@ 20A, $T_j = 25^\circ\text{C}$
$r_t$ 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	$T_j = 25^\circ\text{C}$
	5.0		$T_j = 150^\circ\text{C}$

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

Recovery Characteristics

Parameters	20ETF..	Units	Conditions
$t_{rr}$ Reverse Recovery Time	160	ns	$I_F @ 20\text{Apk}$ @ 100A/ $\mu\text{s}$ @ 25°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	20ETF..	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	0.9	°C/W	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	62	°C/W	
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.5	°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-220AC		

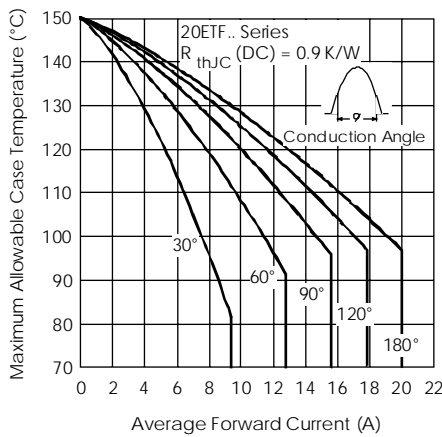


Fig. 1 - Current Rating Characteristics

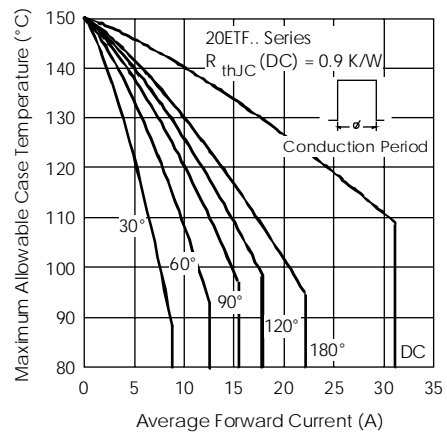


Fig. 2 - Current Rating Characteristics

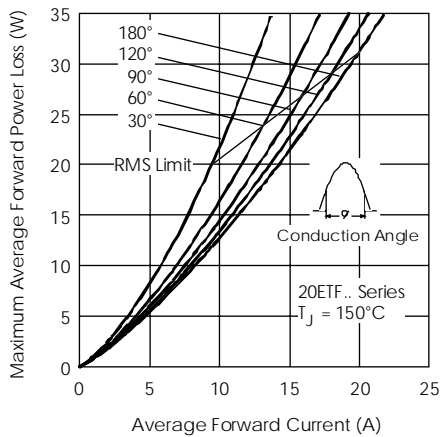


Fig. 3 - Forward Power Loss Characteristics

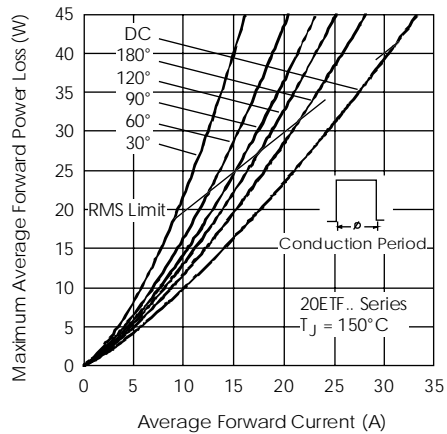


Fig. 4 - Forward Power Loss Characteristics

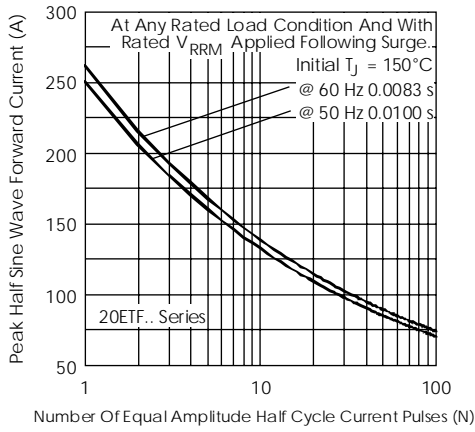


Fig. 5 - Maximum Non-Repetitive Surge Current

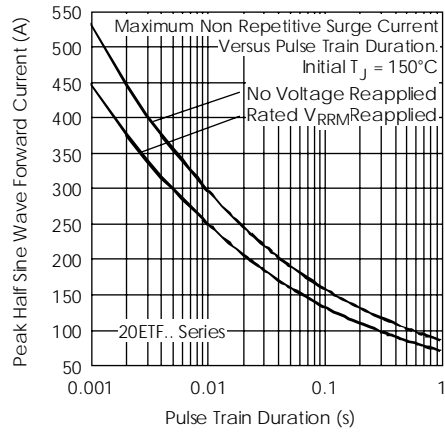


Fig. 6 - Maximum Non-Repetitive Surge Current

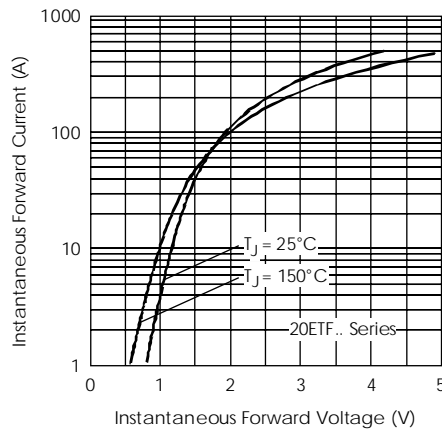


Fig. 7 - Forward Voltage Drop Characteristics

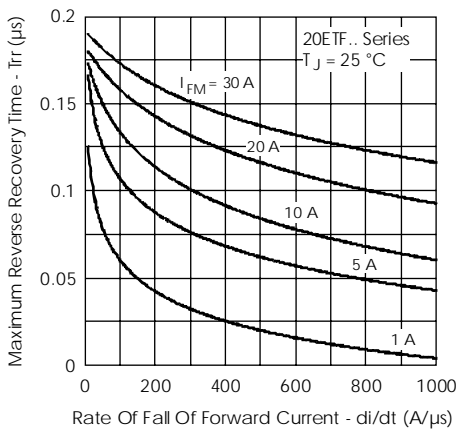


Fig. 8 - Recovery Time Characteristics,  $T_J = 25^\circ\text{C}$

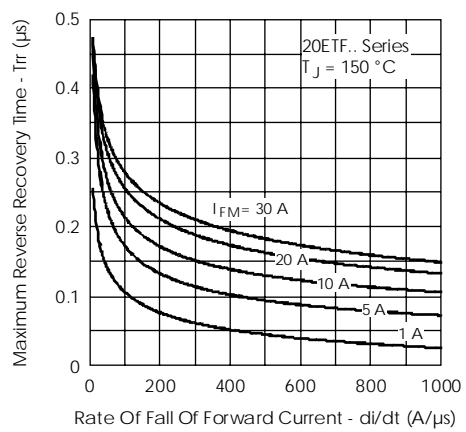


Fig. 9 - Recovery Time Characteristics,  $T_J = 150^\circ\text{C}$

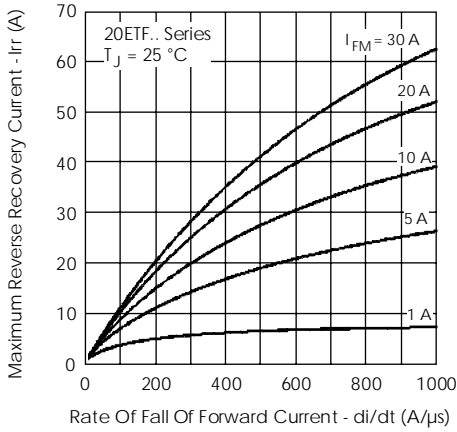


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25^\circ\text{C}$

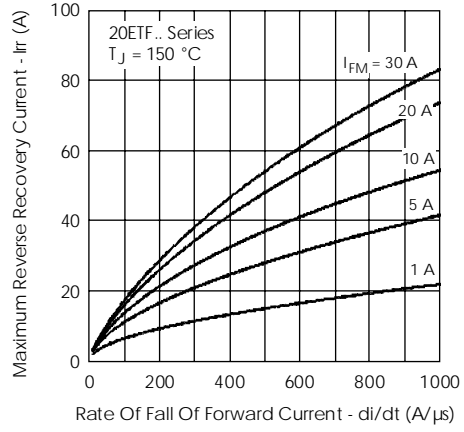


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150^\circ\text{C}$

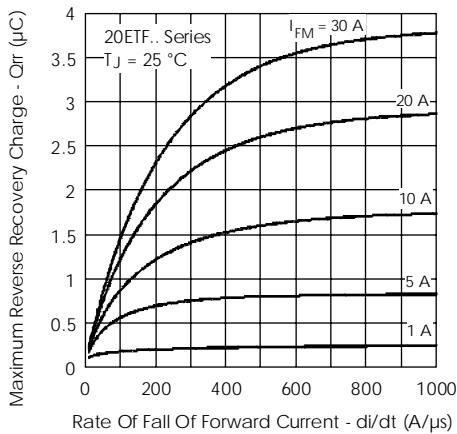


Fig. 12 - Recovery Current Characteristics,  $T_J = 25^\circ\text{C}$

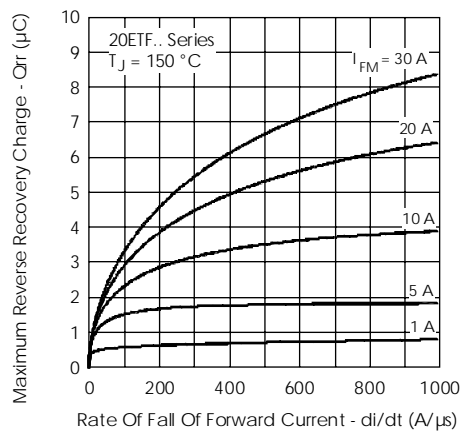


Fig. 13 - Recovery Current Characteristics,  $T_J = 150^\circ\text{C}$

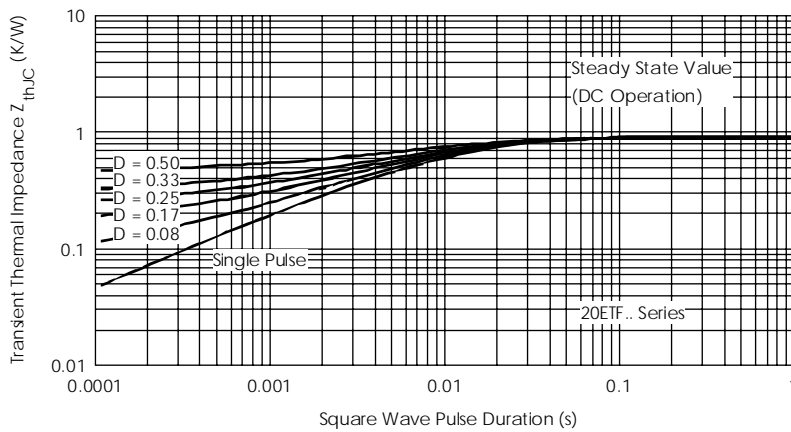
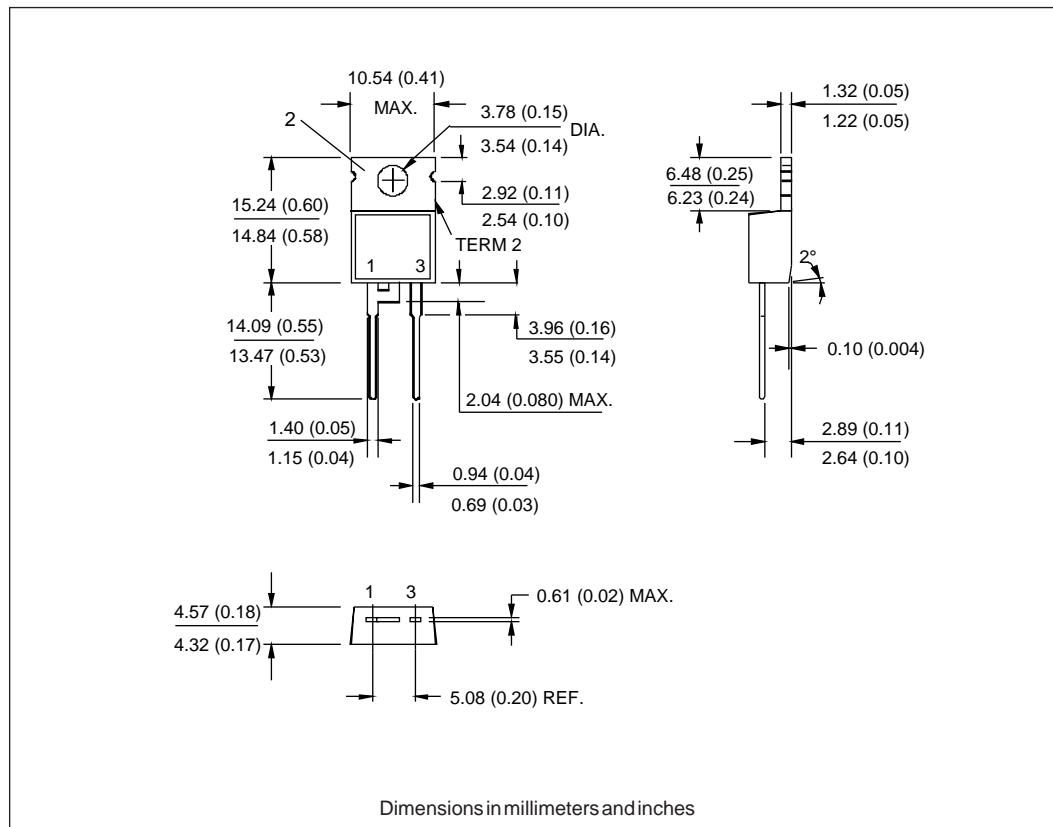


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

Outline Table



Ordering Information Table

Device Code				
20	E	T	F	06
①	②	③	④	⑤

<b>1</b>	-	Current Rating
<b>2</b>	-	Circuit Configuration:
		E = Single Diode
<b>3</b>	-	Package:
		T = TO-220AC
<b>4</b>	-	Type of Silicon:
		F = Fast diode
<b>5</b>	-	Voltage code: Code x 100 = $V_{RRM}$

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

