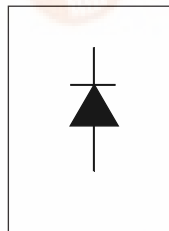


Bulletin I2109 rev. B 03/99

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.

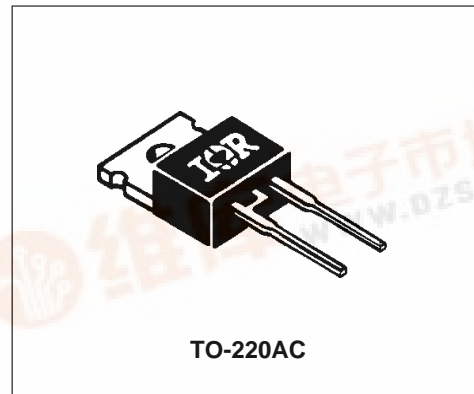
Typical applications are both:

- 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
$t_{rr} @ 1A, 100A/\mu s$	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

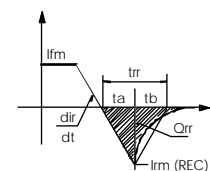
Electrical Specifications

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	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ 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/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..	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		

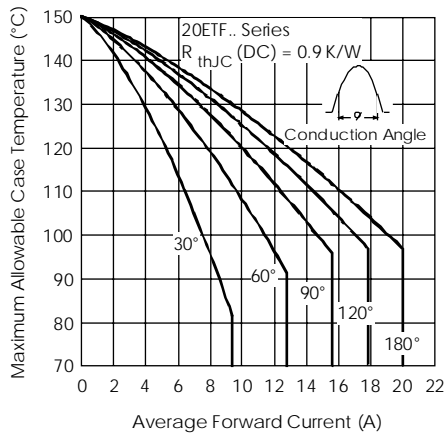


Fig. 1 - Current Rating Characteristics

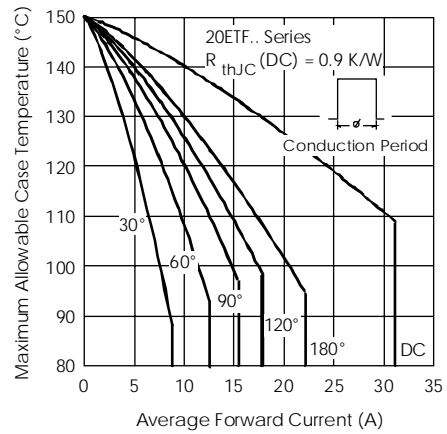


Fig. 2 - Current Rating Characteristics

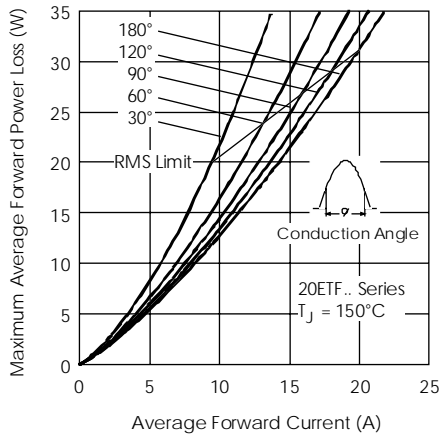


Fig. 3 - Forward Power Loss Characteristics

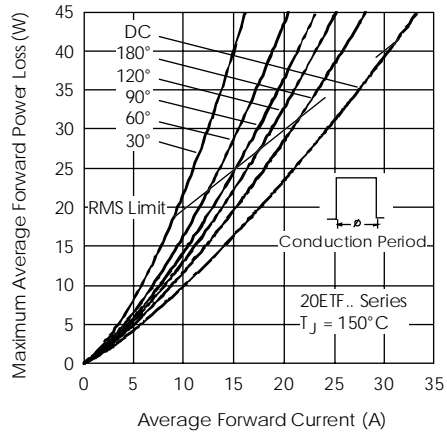


Fig. 4 - Forward Power Loss Characteristics

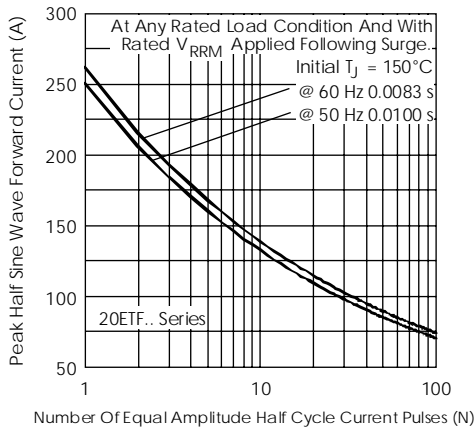


Fig. 5 - Maximum Non-Repetitive Surge Current

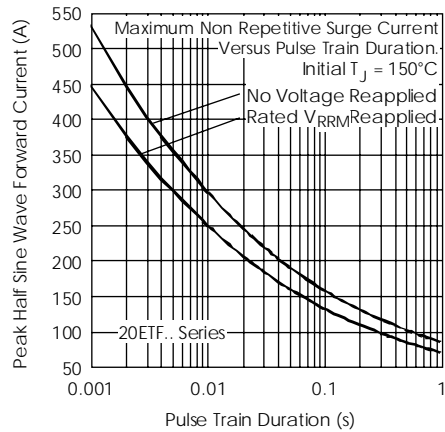


Fig. 6 - Maximum Non-Repetitive Surge Current

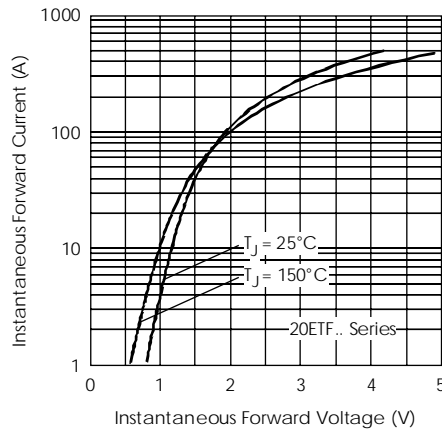


Fig. 7 - Forward Voltage Drop Characteristics

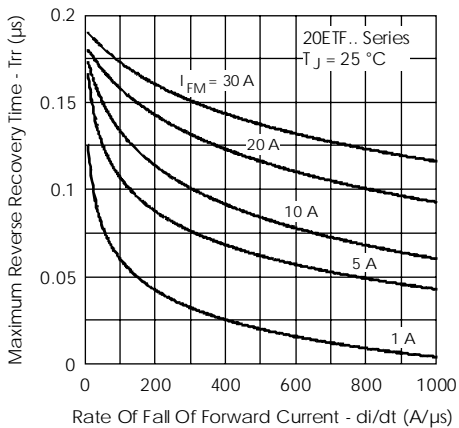


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

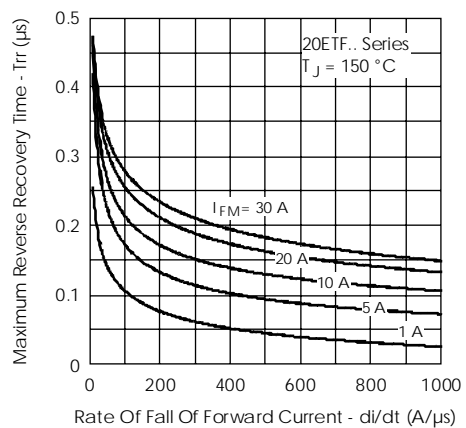


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

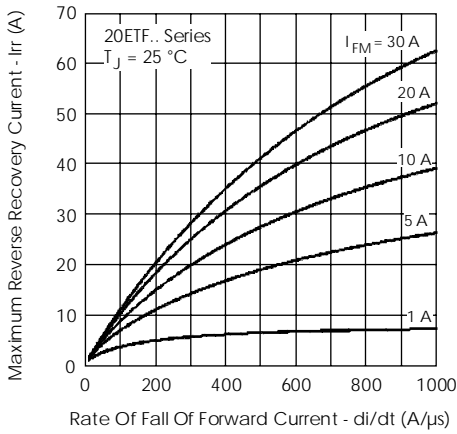


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

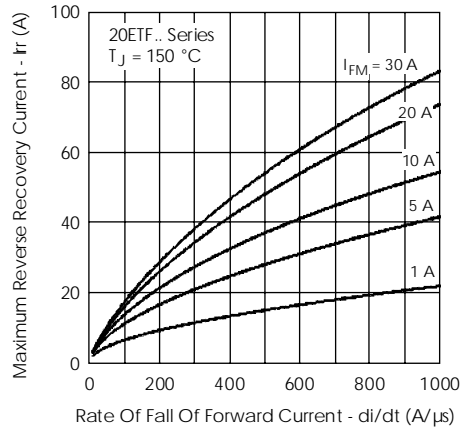


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

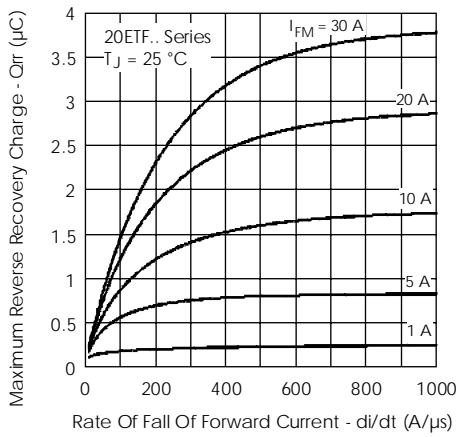


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

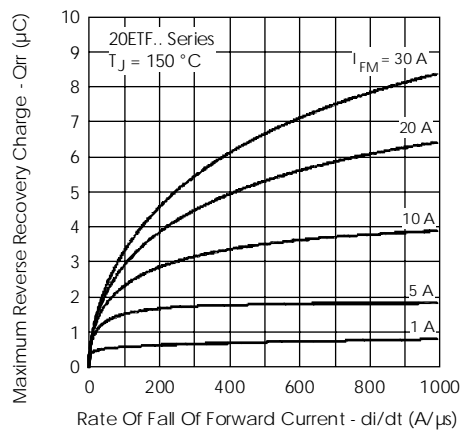


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

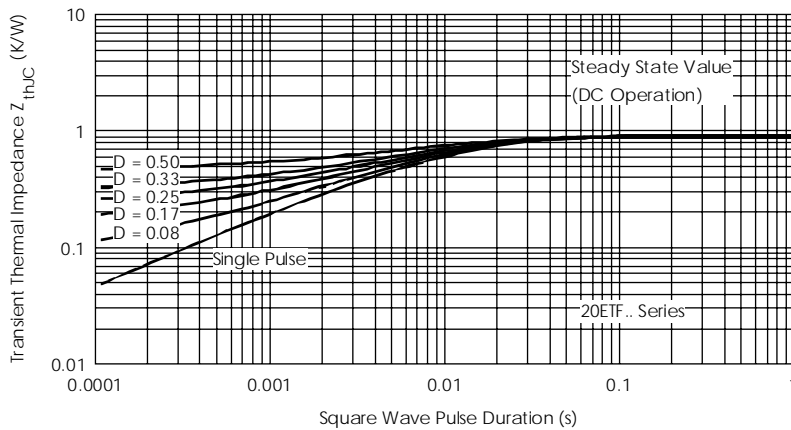
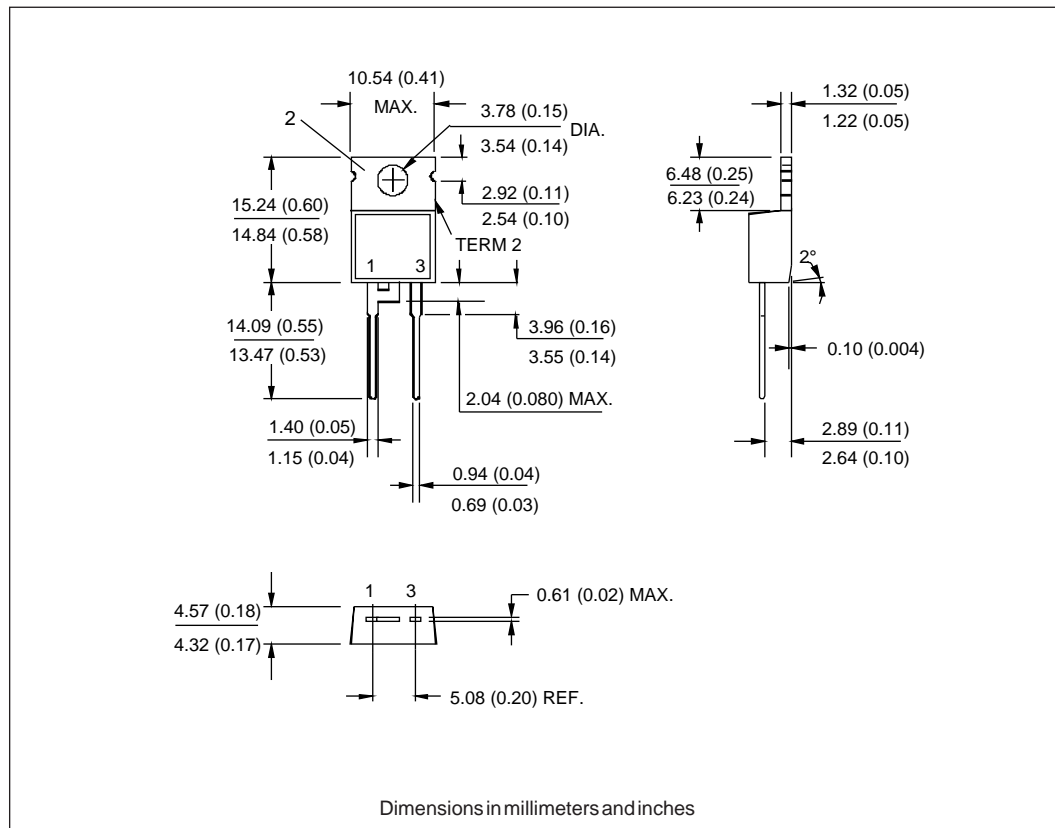


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Ordering Information Table

Device Code				
20	E	T	F	06
①	②	③	④	⑤

- 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}

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

BASE
CATHODE

CATHODE ANODE

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IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
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IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
IR SOUTHEAST ASIA: 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994. Tel: ++ 65 838 4630.
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