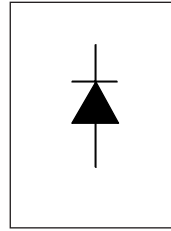


International
IOR Rectifier

QUIETIR Series 20ETF..S HV

FAST SOFT RECOVERY RECTIFIER DIODE



$$V_F < 1.31V @ 20A$$

$$I_{FSM} = 355A$$

$$V_{RRM} 800 \text{ to } 1200V$$

Description/Features

The 20ETF..S 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.

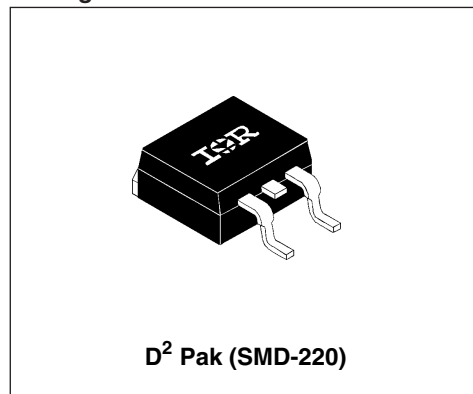
Typical applications are both:

- 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..S	Units
$I_{F(AV)}$ Sinusoidal waveform	20	A
V_{RRM} range	800 to 1200	V
I_{FSM}	355	A
V_F @ 20A, $T_J=25^\circ\text{C}$	1.31	V
t_{rr} @ 1A, 100A/ μs	95	ns
T_J range	-40 to 150	$^\circ\text{C}$

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
20ETF08S	800	900	6
20ETF10S	1000	1100	
20ETF12S	1200	1300	

Absolute Maximum Ratings

Parameters	20ETF..S	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	300	A	10ms Sine pulse, rated V_{RRM} applied
	355		10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t for fusing	450	A^2s	10ms Sine pulse, rated V_{RRM} applied
	635		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	6350	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

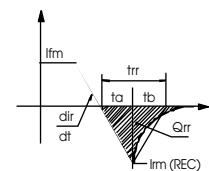
Electrical Specifications

Parameters	20ETF..S	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.31	V	@ 20A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	11.88	$m\Omega$	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.93	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	6		$T_J = 150^\circ\text{C}$

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

Recovery Characteristics

Parameters	20ETF..S	Units	Conditions
t_{rr} Reverse Recovery Time	400	ns	$I_F @ 20\text{Apk}$ @ 25A/ μs @ 25°C
I_{rr} Reverse Recovery Current	6.1	A	
Q_{rr} Reverse Recovery Charge	1.7	μC	@ 25°C
S Snap Factor t_b/t_a	0.6	typical	



Thermal-Mechanical Specifications

Parameters	20ETF..S	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 (PCB Mount)**	62	°C/W	
T _s Soldering Temperature	240	°C	
wt Approximate Weight	2(0.07)	g(oz.)	
Case Style	D ² Pak (SMD-220)		

**When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4oz (140µm) copper 40°C/W
 For recommended footprint and soldering techniques refer to application note #AN-994

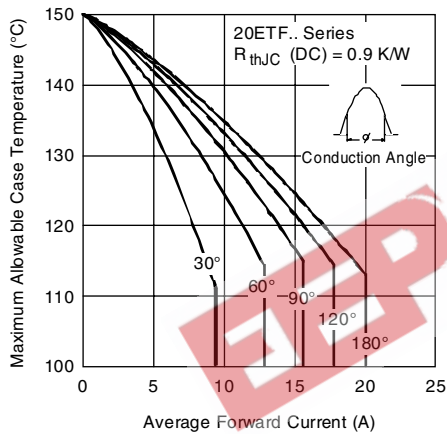


Fig. 1 - Current Rating Characteristics

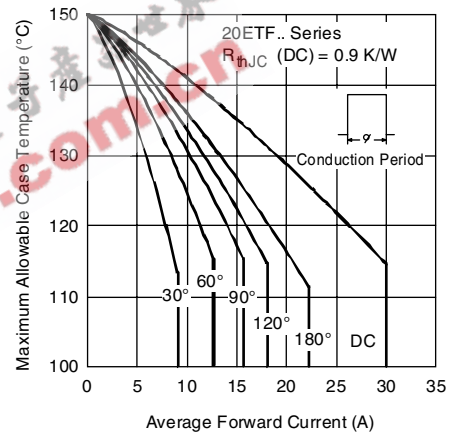


Fig. 2 - Current Rating Characteristics

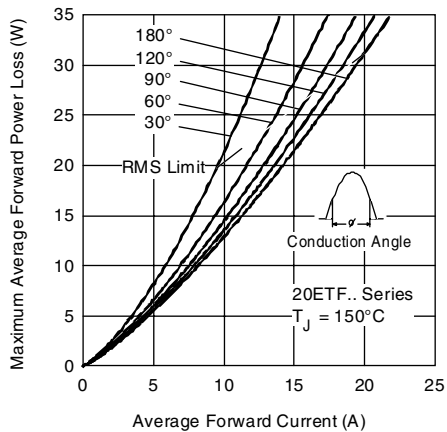


Fig. 3 - Forward Power Loss Characteristics

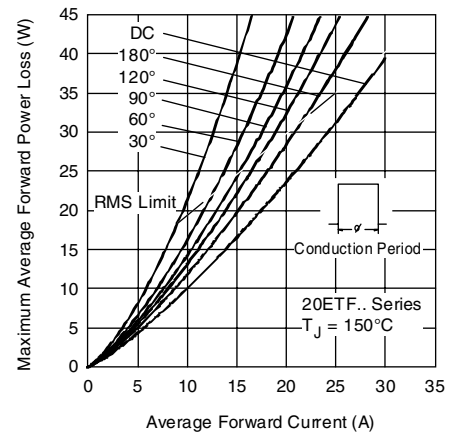


Fig. 4 - Forward Power Loss Characteristics

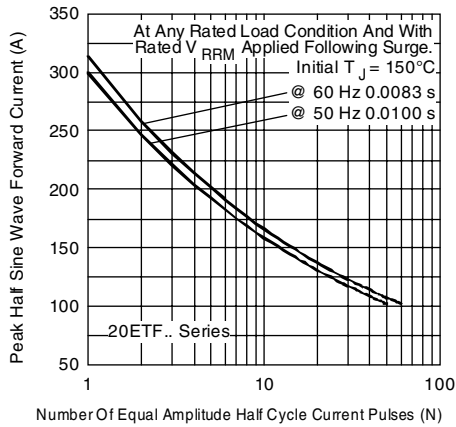


Fig. 5 - Maximum Non-Repetitive Surge Current

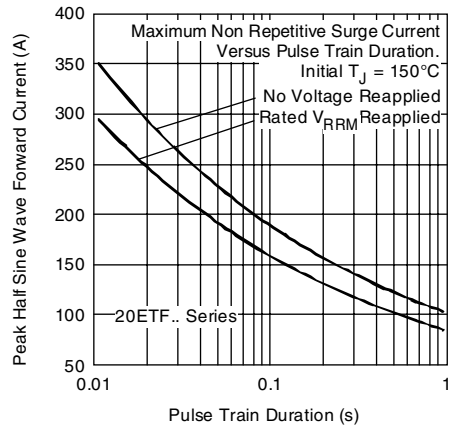


Fig. 6 - Maximum Non-Repetitive Surge Current

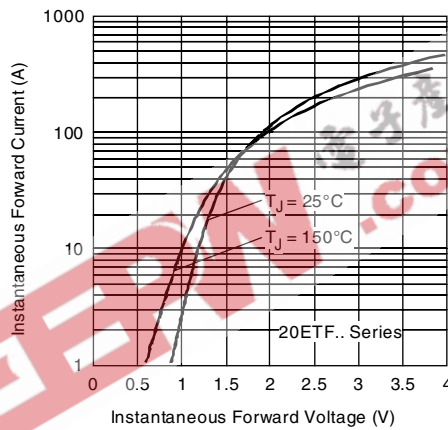


Fig. 7 - Forward Voltage Drop Characteristics

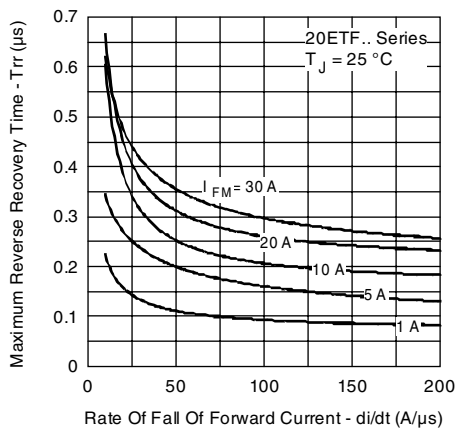


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

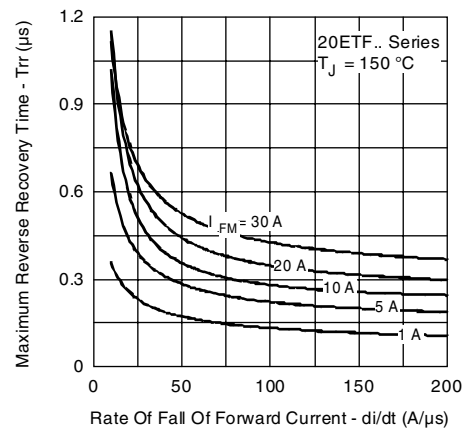


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

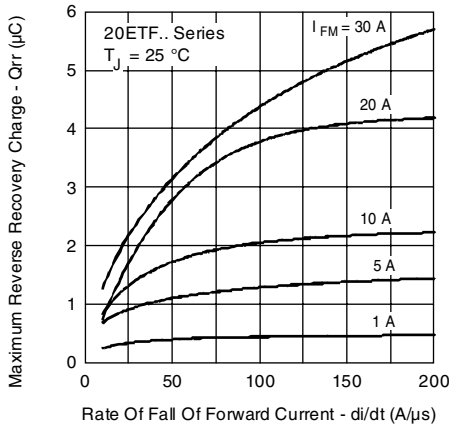


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

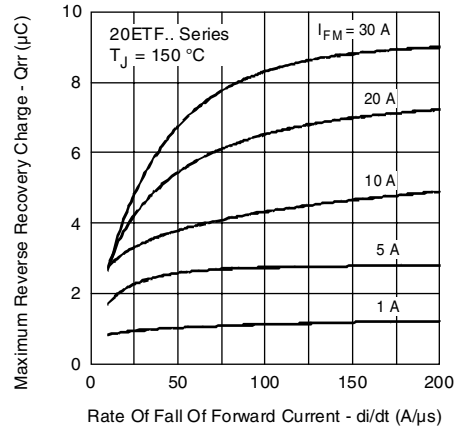


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

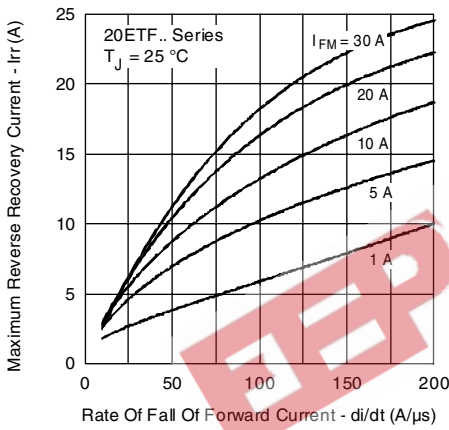


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

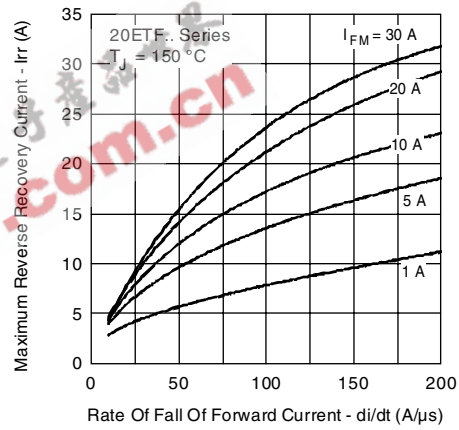


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

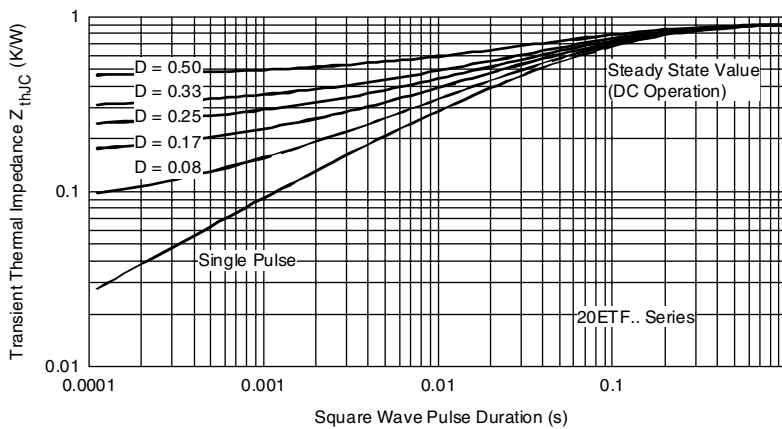


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Ordering Information Table

Device Code						
20	E	T	F	12	S	TRL
①	②	③	④	⑤	⑥	⑦

1	-	Current Rating
2	-	Circuit Configuration: E = Single Diode
3	-	Package: T = TO-220AC
4	-	Type of Silicon: S = Standard Recovery Rectifier
5	-	Voltage code: Code x 100 = V_{RRM}
6	-	S = TO-220 D ² Pak (SMD-220) Version
7	-	Tape and Reel Option:

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

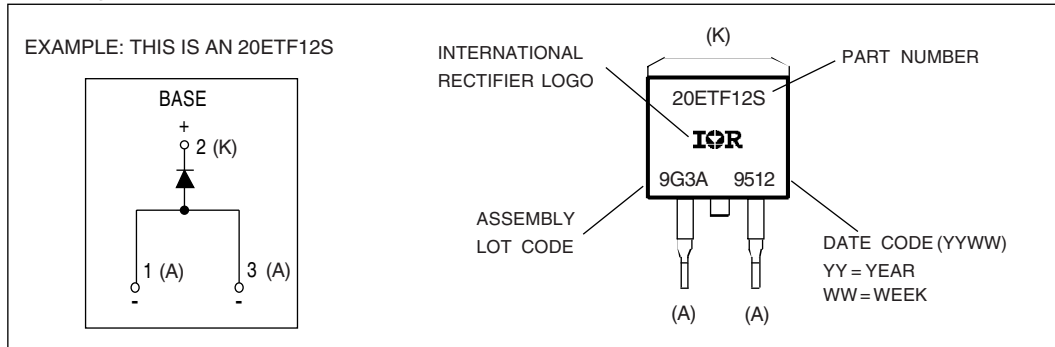
TRL = Left Reel
TRR = Right Orientation Reel

Outline Table

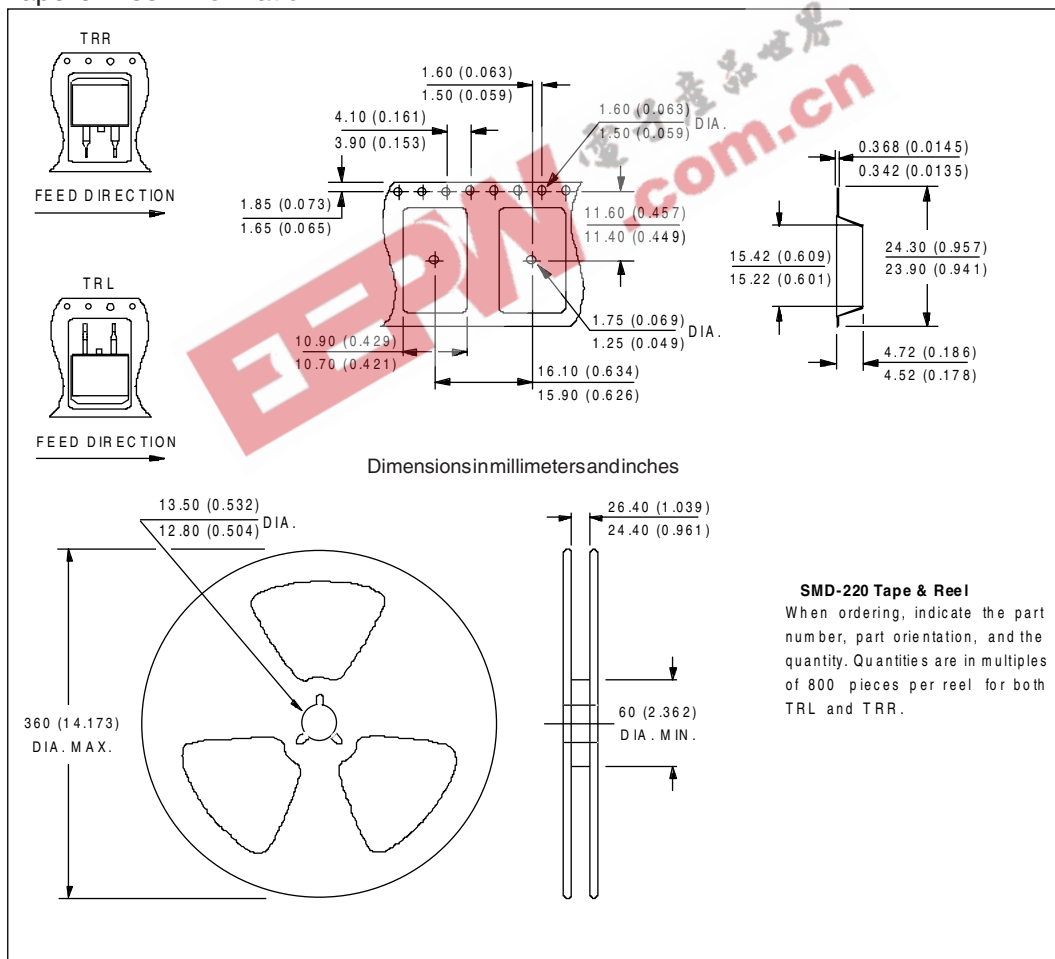
Dimensions in millimeters and inches

MINIMUM RECOMMENDED FOOTPRINT

Marking Information



Tape & Reel Information



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International
IR Rectifier

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IR ITALY:	Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 4510111 Fax: ++ 39 11 4510220
IR FAR EAST:	K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171 Tel: 81 3 3983 0086 Fax: 81 3 3983 0642
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