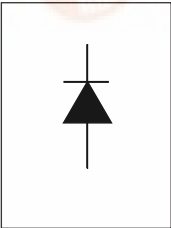


Preliminary Data Sheet I2128 09/97

International
IOR Rectifier

QUIETIR Series
20ETF..S HV

FAST SOFT RECOVERY
RECTIFIER DIODE



$V_F < 1.31V @ 20A$
 $I_{FSM} = 355A$
 $V_{RRM} 1000 \text{ to } 1200V$

Description/Features

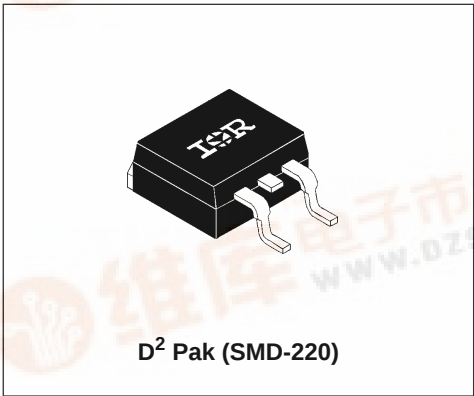
The 20ETF..S fast soft recovery **QUIETIR** rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop. The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

- 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}	1000 to 1200	V
I_{FSM}	355	A
$V_F @ 20A, T_J = 25^\circ C$	1.31	V
$t_{rr} @ 1A, 100A/\mu s$	95	ns
T_J	-40 to 150	$^\circ C$

Package Outline



20ETF..S HV *QUIETIR* Series

Preliminary Data Sheet I2128 09/97

International
IR Rectifier

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
20ETF10S	1000	1100	6
20ETF12S	1200	1300	

Absolute Maximum Ratings

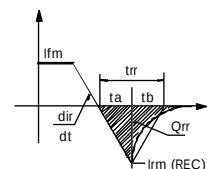
Parameters	20ETF..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	20	A	@ $T_C = 97^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	300	A	10ms Sine pulse, rated V_{RRM} applied
	355		10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t 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°C	
r _t	Forward slope resistance	11.88	mΩ	T _j = 150°C	
V _{F(TO)}	Threshold voltage	0.93	V		
I _{RM}	Max. Reverse Leakage Current	0.1	mA	T _j = 25 °C	V _R = rated V _{RRM}
		6		T _j = 150 °C	

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	
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

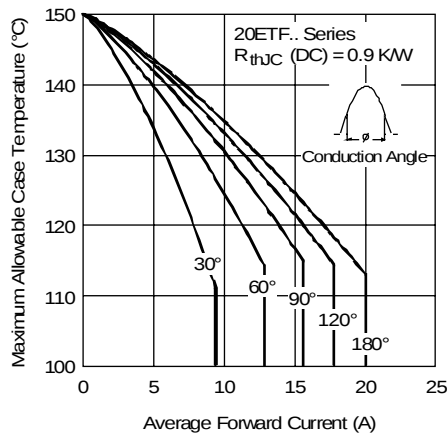


Fig. 1 - Current Rating Characteristics

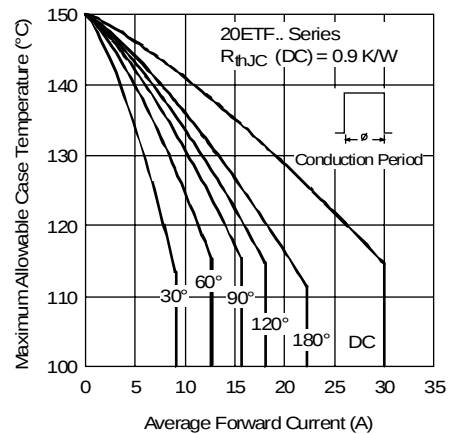


Fig. 2 - Current Rating Characteristics

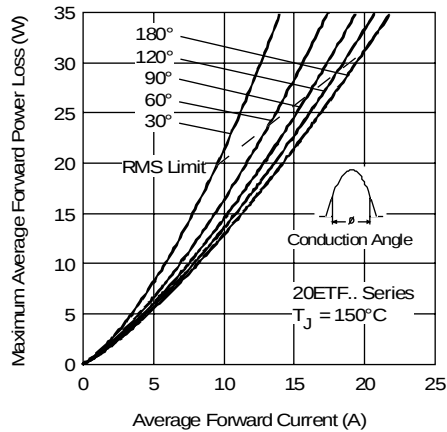


Fig. 3 - Forward Power Loss Characteristics

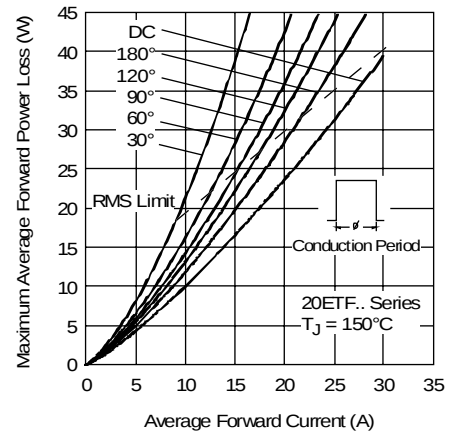


Fig. 4 - Forward Power Loss Characteristics

20ETF..S HV QUIET^{IR} Series

Preliminary Data Sheet I2128 09/97

International
IOR Rectifier

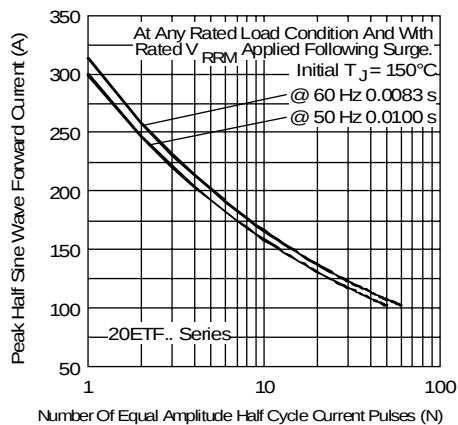


Fig. 5 - Maximum Non-Repetitive Surge Current

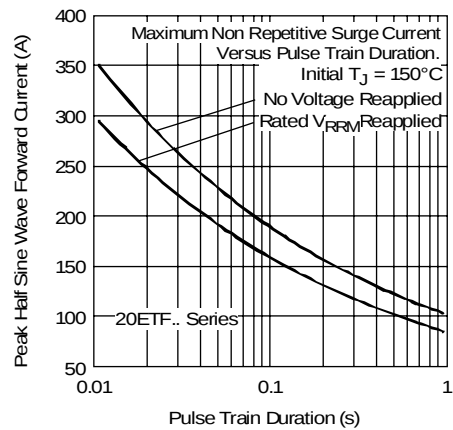


Fig. 6 - Maximum Non-Repetitive Surge Current

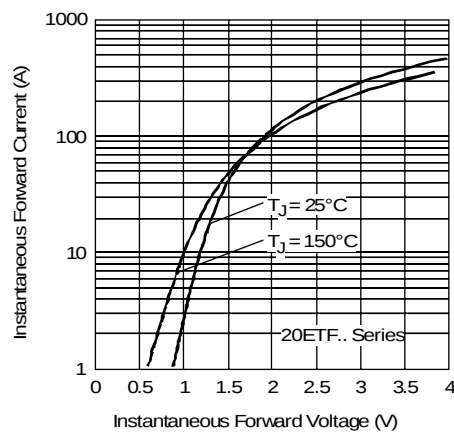


Fig. 7 - Forward Voltage Drop Characteristics

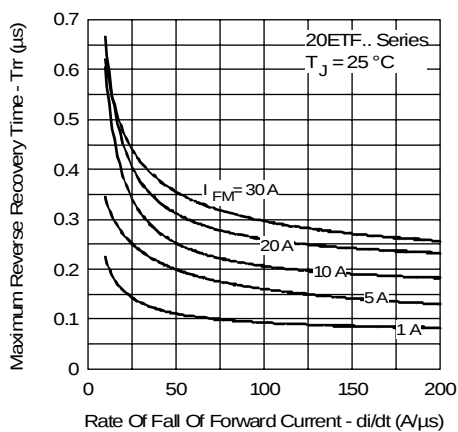


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

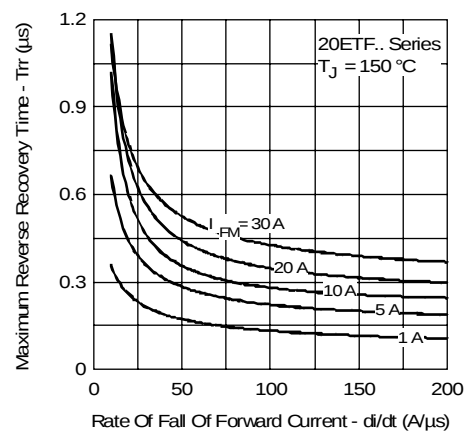


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

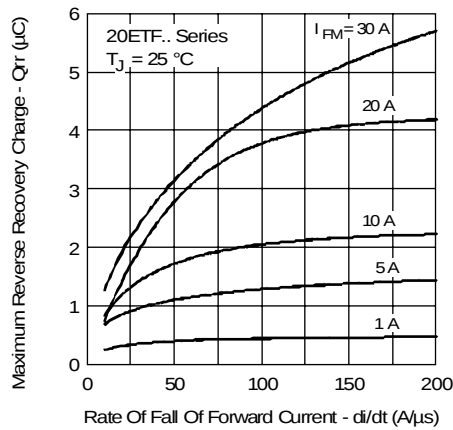


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

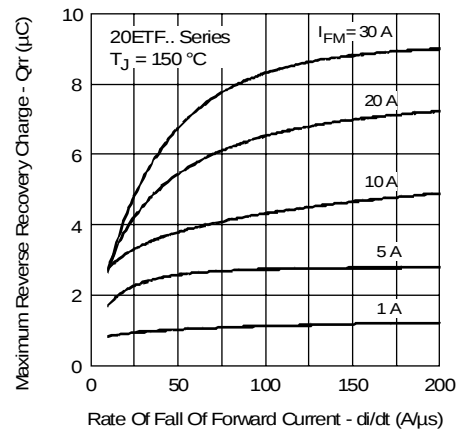


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

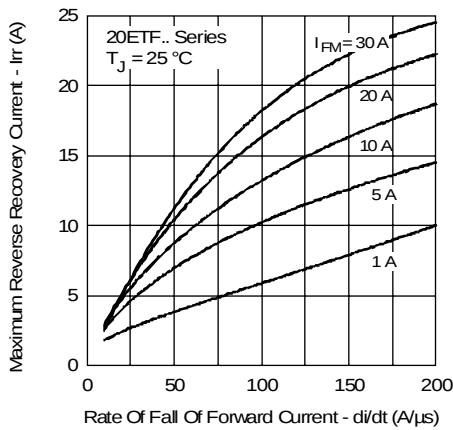


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

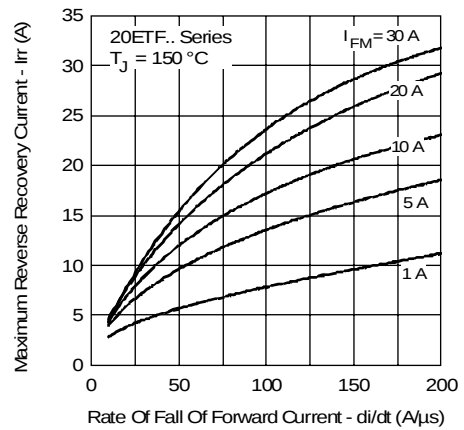


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

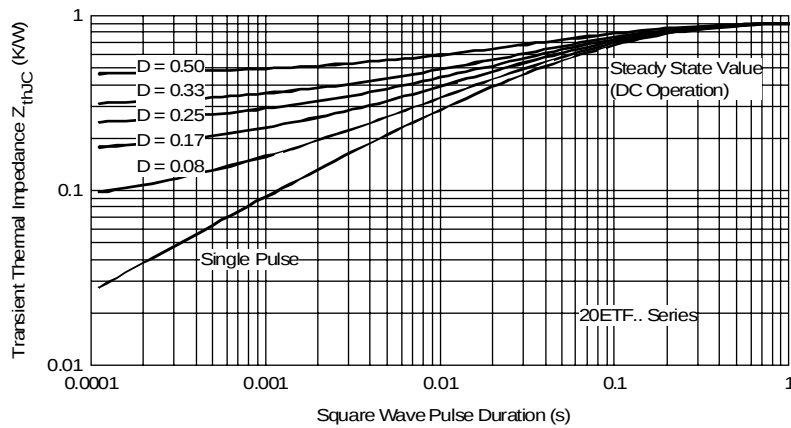
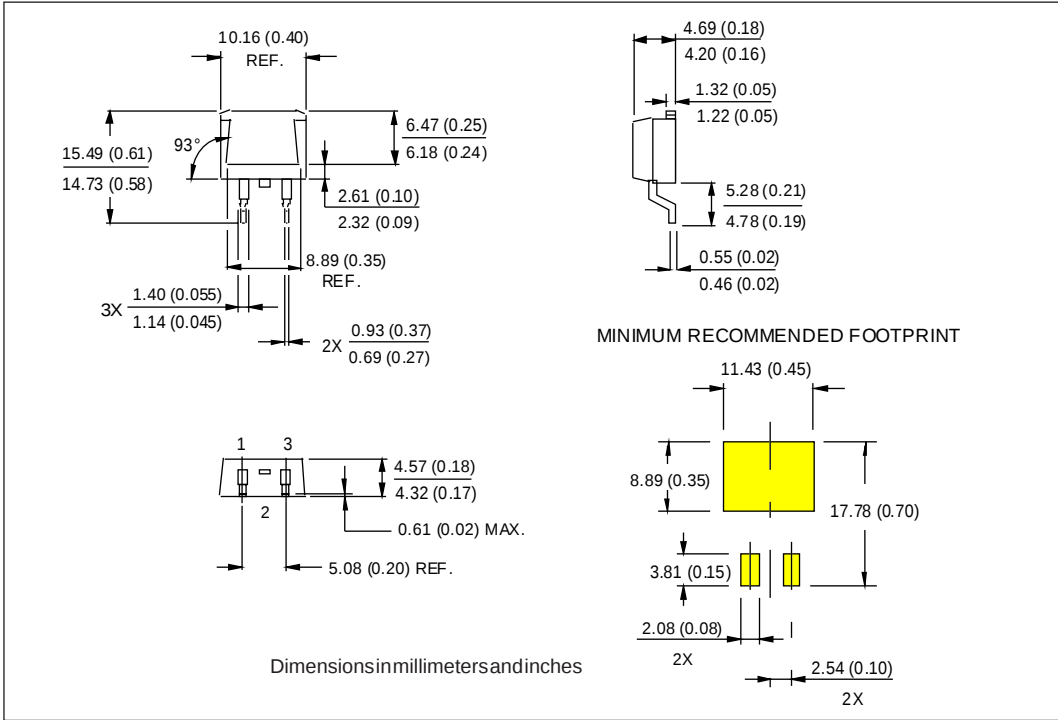


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

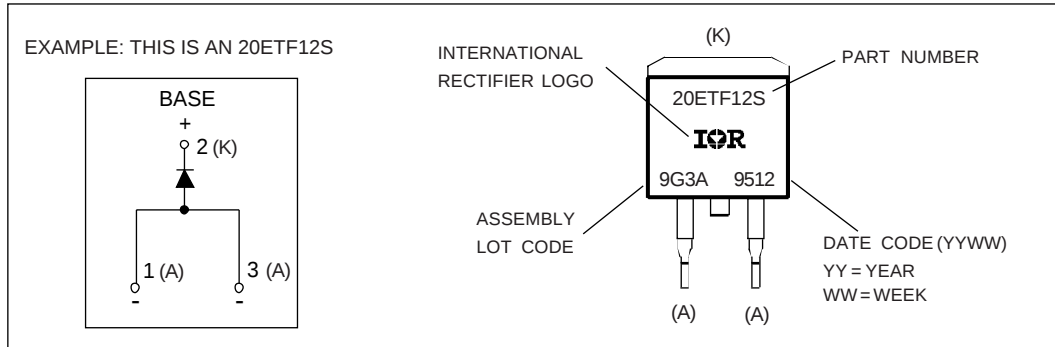
Ordering Information Table

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:					
	TRL = Left Reel					
	TRR = Right Orientation Reel					

Outline Table



Marking Information



Tape & Reel Information

