

I2149 rev. A 11/99

International
IR Rectifier

QUIETIR Series
10ETF..S

FAST SOFT RECOVERY
RECTIFIER DIODE



$V_F < 1.33V @ 10A$
 $t_{rr} = 80ns$
 $V_{RRM} 1000 \text{ to } 1200V$

Description/Features

The 10ETF..S fast soft recoveryQUIETIRrectifier 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.

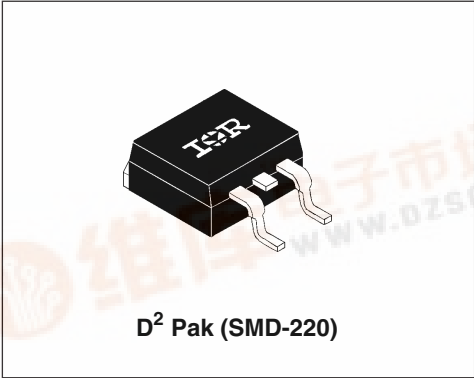
Typical applications are both:

- 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	10ETF..S	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM} range	1000to 1200	V
I_{FSM}	160	A
V_F @ 10 A, $T_J = 25^{\circ}C$	1.33	V
t_{rr} @ 1 A, 100A/ μs	80	ns
T_J range	-40to 150	$^{\circ}C$

Package Outline



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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
10ETF10S	1000	1100	4
10ETF12S	1200	1300	

Absolute Maximum Ratings

Parameters	10ETF..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	10	A	@ $T_C = 125^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	160	A	10ms Sine pulse, rated V_{RRM} applied
	185		10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t for fusing	128	A^2s	10ms Sine pulse, rated V_{RRM} applied
	180		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1800	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

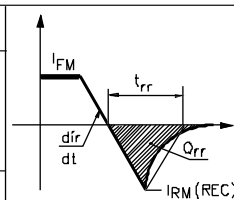
Electrical Specifications

Parameters	10ETF..S	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.33	V	@ 10A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	22.9	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.96	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	4		$T_J = 150^\circ\text{C}$

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

Recovery Characteristics

Parameters	10ETF..S	Units	Conditions
t_{rr} Reverse Recovery Time	310	ns	$I_F @ 10\text{Apk}$ @ 25A/μs @ 25°C
I_{rr} Reverse Recovery Current	4.7	A	
Q_{rr} Reverse Recovery Charge	1.05	μC	
S Typical Snap Factor	0.6		



Thermal-Mechanical Specifications

Parameters	10ETF..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	1.5	°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 4 oz (140μm) copper 40°C/W
For recommended footprint and soldering techniques refer to application note #AN-994

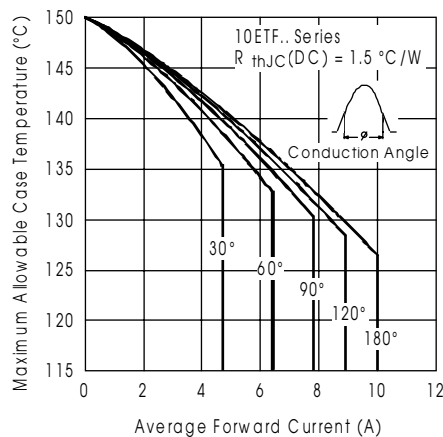


Fig. 1 - Current Rating Characteristics

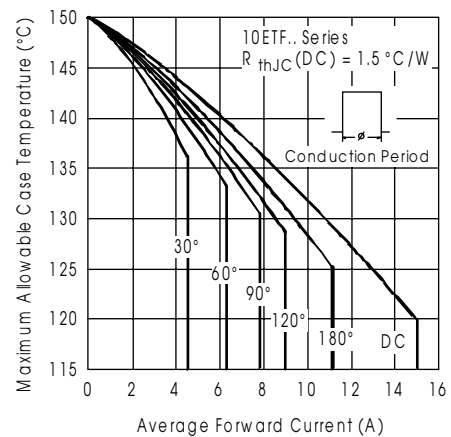


Fig. 2 - Current Rating Characteristics

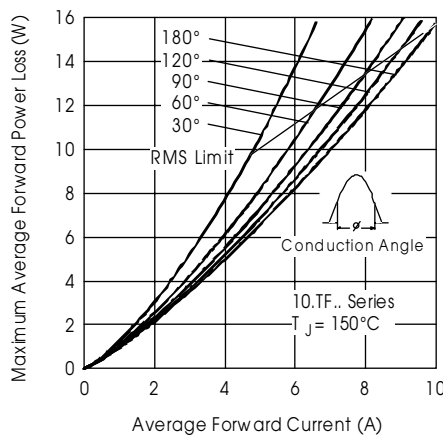


Fig. 3 - Forward Power Loss Characteristics

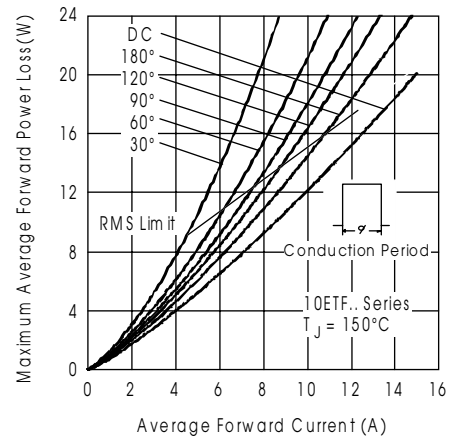


Fig. 4 - Forward Power Loss Characteristics

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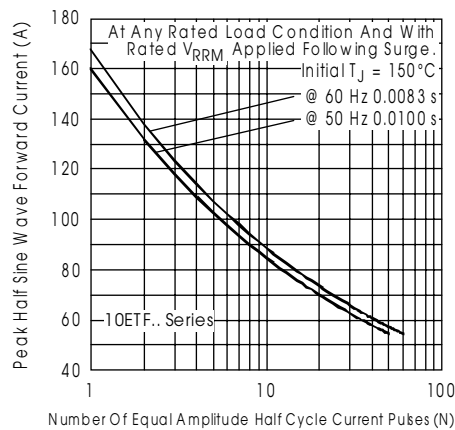


Fig. 5 - Maximum Non-Repetitive Surge Current

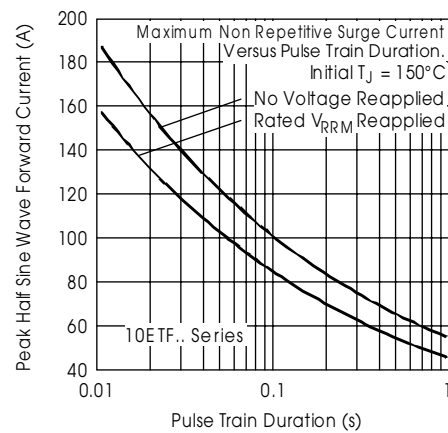


Fig. 6 - Maximum Non-Repetitive Surge Current

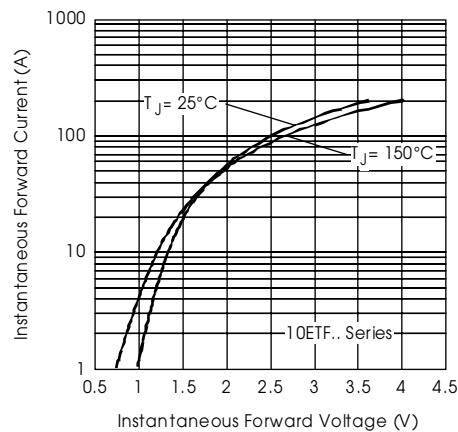


Fig. 7 - Forward Voltage Drop Characteristics

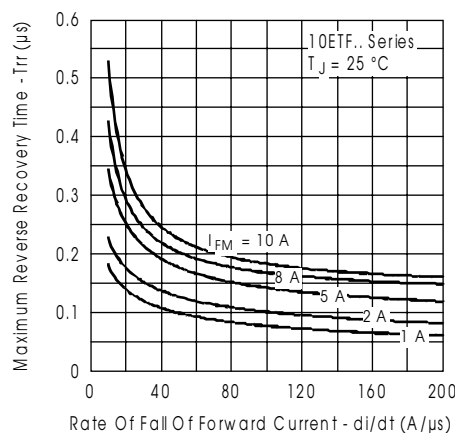


Fig. 8 - Recovery Time Characteristics, $T_j = 25^\circ\text{C}$

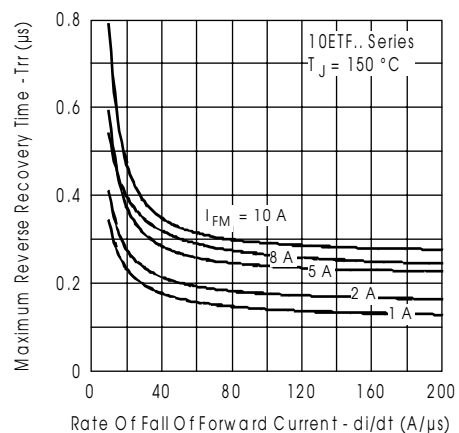


Fig. 9 - Recovery Time Characteristics, $T_j = 150^\circ\text{C}$

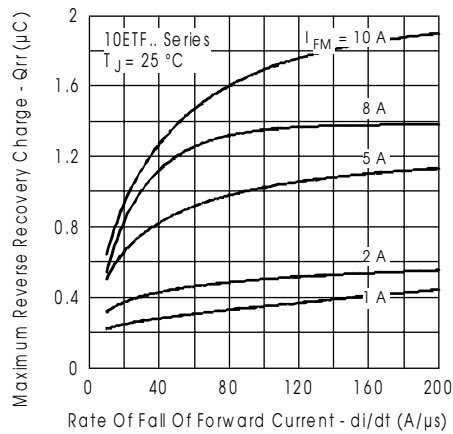


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

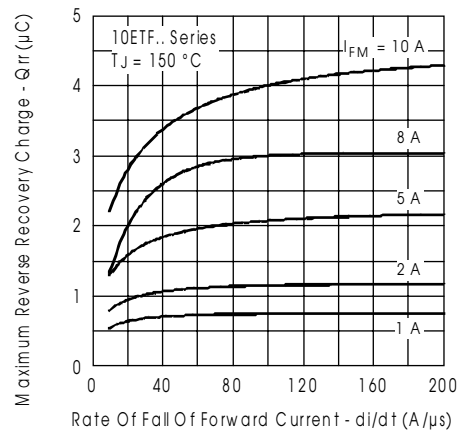


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

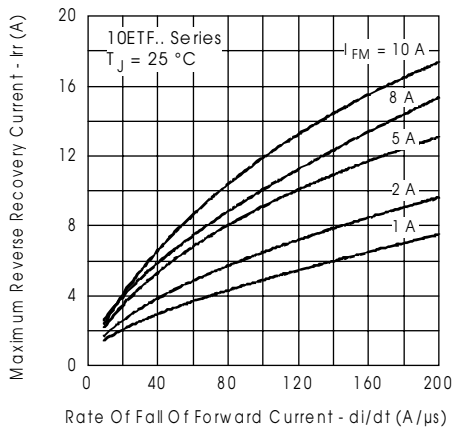


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

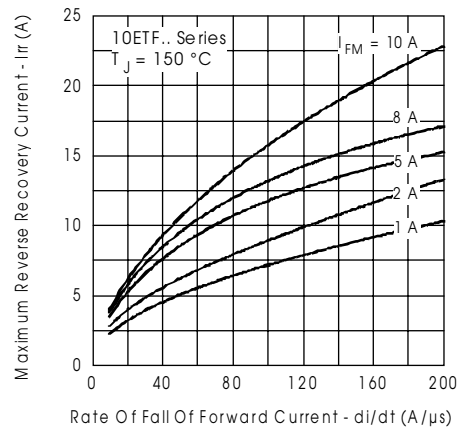


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

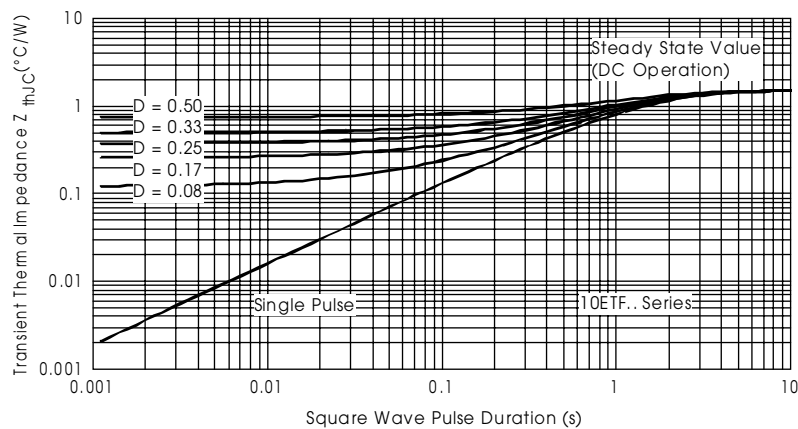


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

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Ordering Information Table

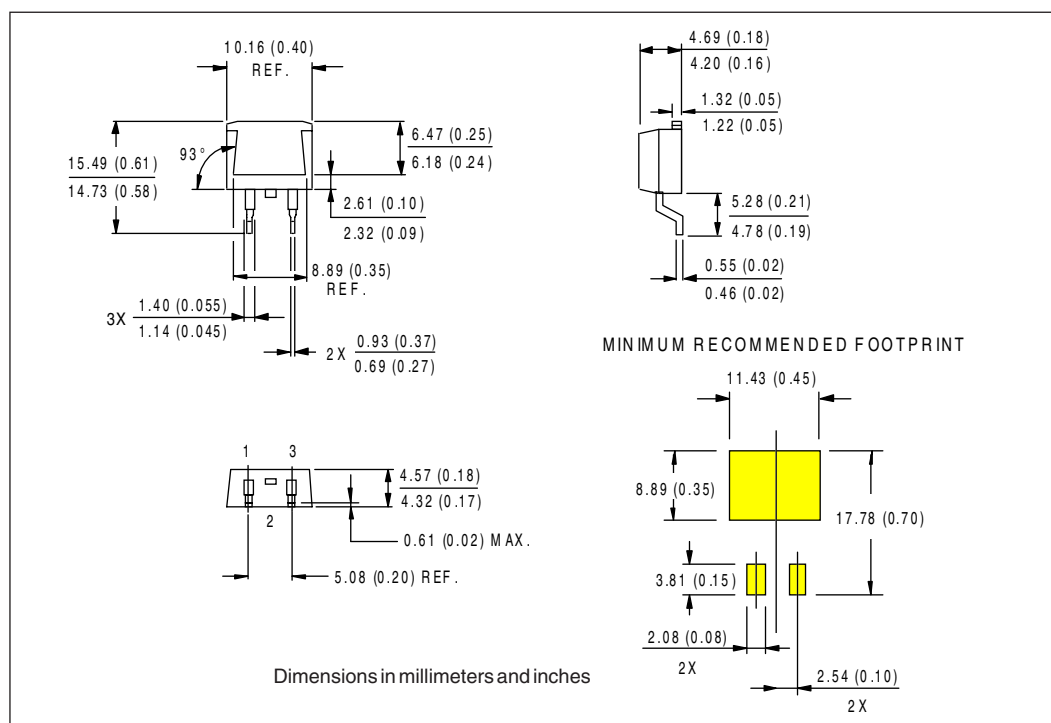
Device Code						
10	E	T	F	12	S	TRL
1	2	3	4	5	6	7

1	-	Current Rating
2	-	Circuit Configuration: E = Single Diode
3	-	Package: T = TO-220AC
4	-	Type of Silicon: F = Fast Soft 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

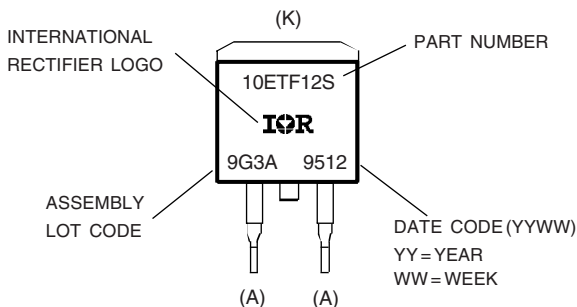
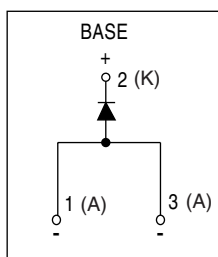
10 = 1000V
12 = 1200V

TRL = Left Reel
TRR = Right Orientation Reel

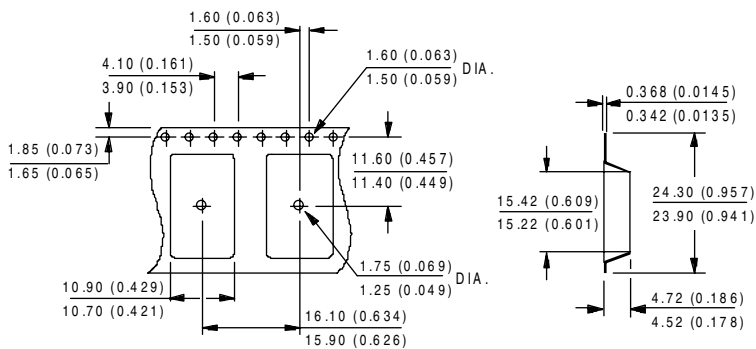
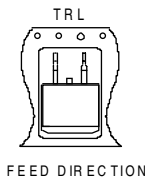
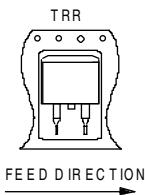
Outline Table



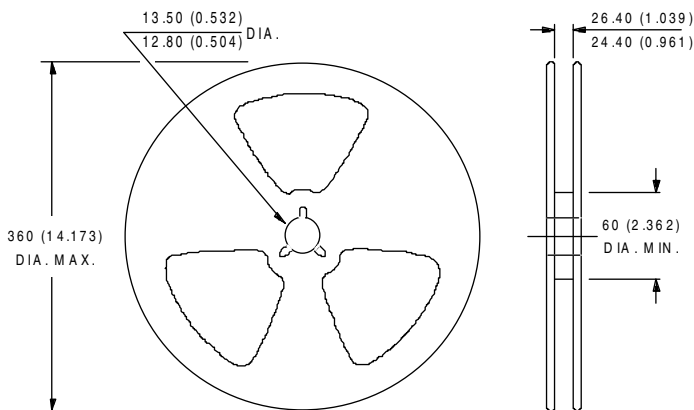
Marking Information



Tape & Reel Information



Dimensions in millimeters and inches



SMD-220 Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

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Data and specifications subject to change without notice.