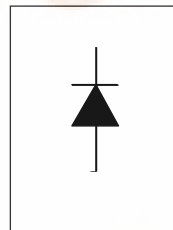


I2140 rev. A 12/99

International IR Rectifier

QUIETIR Series 10ETF..S

FAST SOFT RECOVERY RECTIFIER DIODE



$V_F < 1.2V @ 10A$
 $t_{rr} = 50ns$
 $V_{RRM} 200 \text{ to } 600V$

Description/Features

The 10ETF..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.

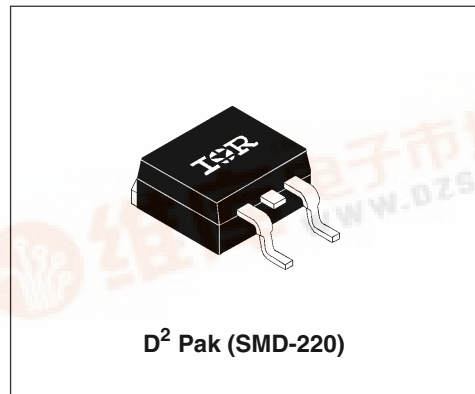
Typical applications are both:

- 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	10ETF..S	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM} range	200 to 600	V
I_{FSM}	150	A
$V_F @ 10A, T_J = 25^\circ C$	1.2	V
$t_{rr} @ 1A, 100A/\mu s$	50	ns
T_J range	-40 to 150	$^\circ C$

Package Outline



10ETF..S QUIETIR Series

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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
10ETF02S	200	300	2
10ETF04S	400	500	
10ETF06S	600	700	

Absolute Maximum Ratings

Parameters	10ETF..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	10	A	@ $T_C = 128^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	150	A	10ms Sine pulse, rated V_{RRM} applied
	160		10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t for fusing	112.5	A^2s	10ms Sine pulse, rated V_{RRM} applied
	160		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1125	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

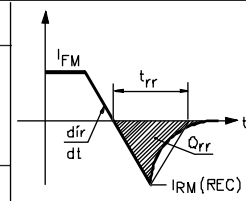
Electrical Specifications

Parameters	10ETF..S	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.2	V	@ 10A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	12.7	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	1.25	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	2.0		$T_J = 150^\circ\text{C}$

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

Recovery Characteristics

Parameters	10ETF..S	Units	Conditions
t_{rr} Reverse Recovery Time	145	ns	$I_F @ 10\text{Apk}$ @ 25A/μs @ 25°C
I_{rr} Reverse Recovery Current	2.75	A	
Q_{rr} Reverse Recovery Charge	0.32	μC	
S 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)**	40	°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

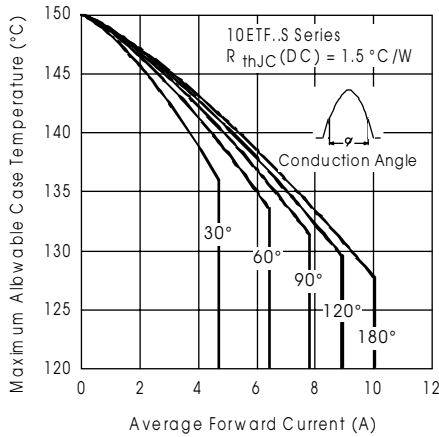


Fig. 1 - Current Rating Characteristics

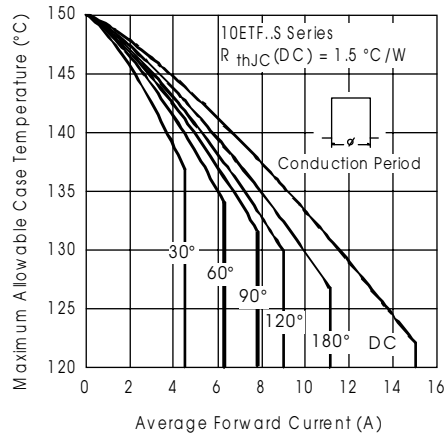


Fig. 2 - Current Rating Characteristics

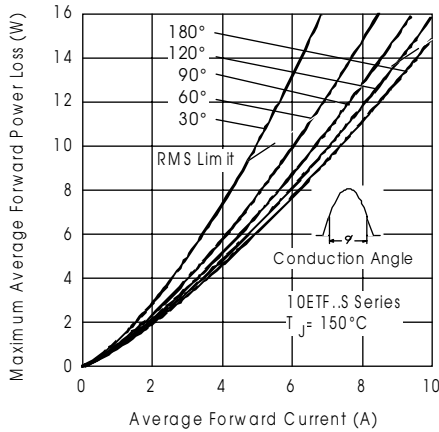


Fig. 3 - Forward Power Loss Characteristics

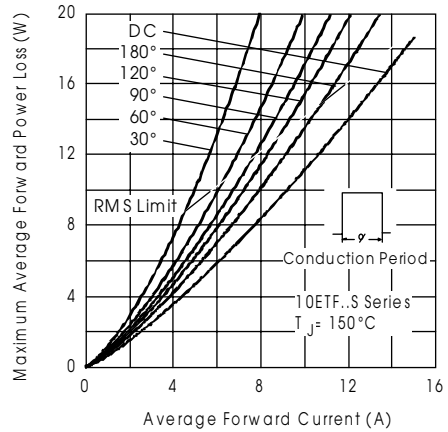


Fig. 4 - Forward Power Loss Characteristics

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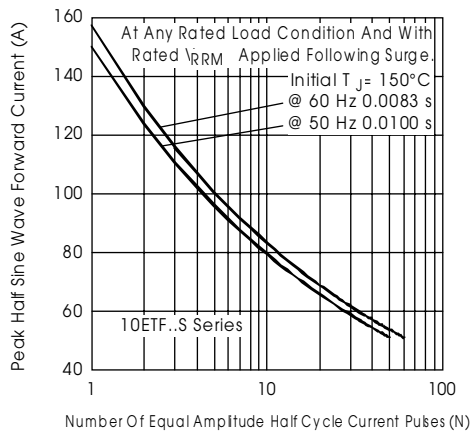


Fig. 5 - Maximum Non-Repetitive Surge Current

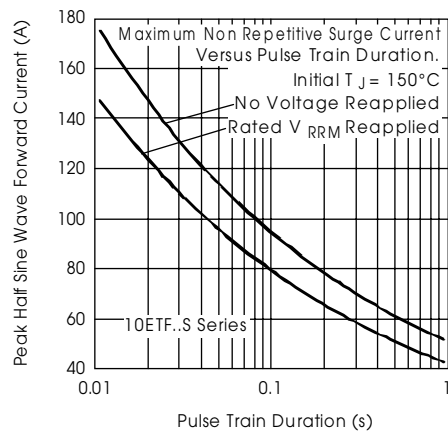


Fig. 6 - Maximum Non-Repetitive Surge Current

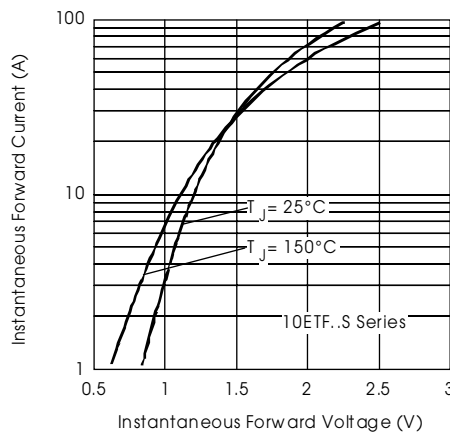


Fig. 7 - Forward Voltage Drop Characteristics

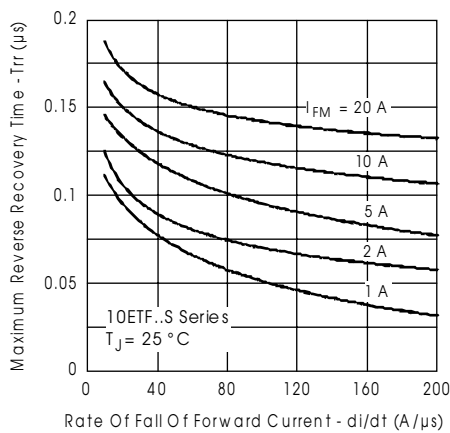


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

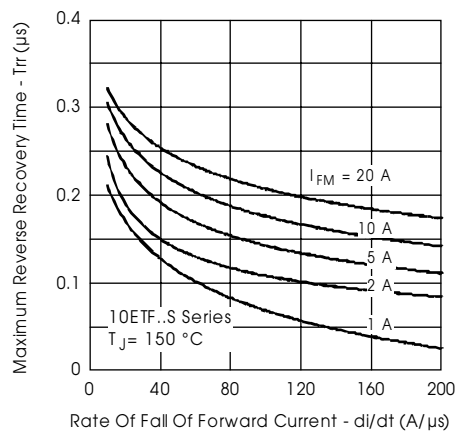


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

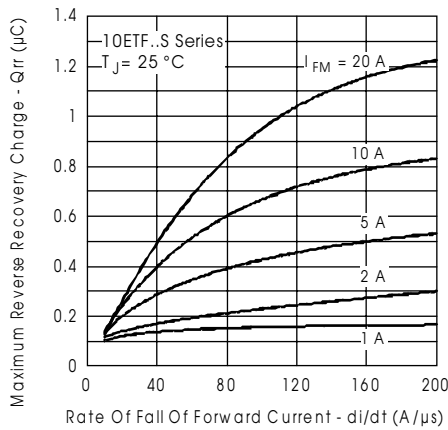


Fig. 10 - Recovery Charge Characteristics, $T_j = 25^\circ\text{C}$

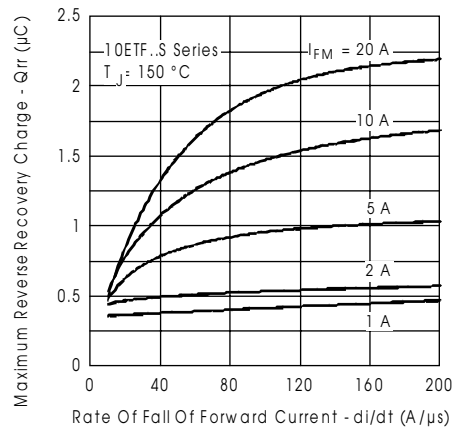


Fig. 11 - Recovery Charge Characteristics, $T_j = 150^\circ\text{C}$

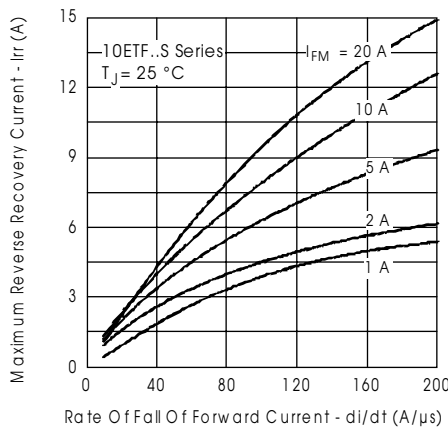


Fig. 12 - Recovery Current Characteristics, $T_j = 25^\circ\text{C}$

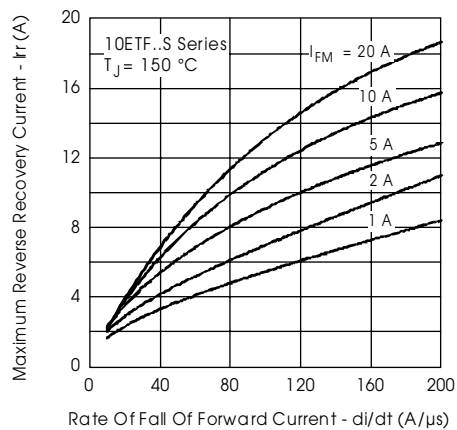


Fig. 13 - Recovery Current Characteristics, $T_j = 150^\circ\text{C}$

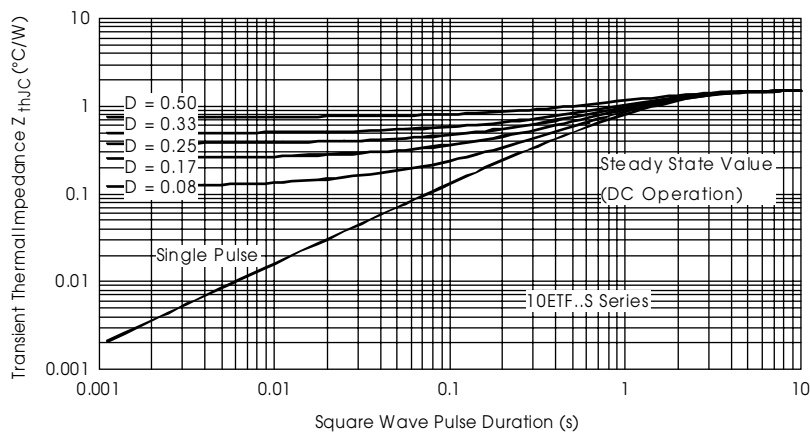


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

10ETF..S QUIETIR Series

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Ordering Information Table

Device Code						
10	E	T	F	06	S	TRL
①	②	③	④	⑤	⑥	⑦

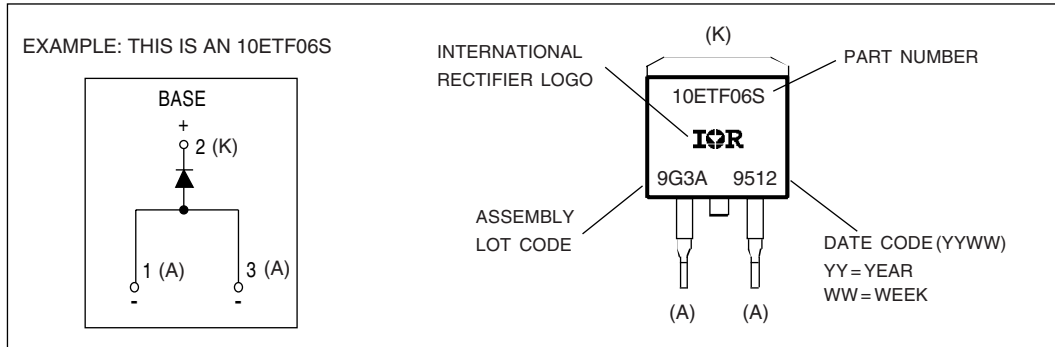
<p>1 - Current Rating</p> <p>2 - Circuit Configuration: E = Single Diode</p> <p>3 - Package: T = TO-220AC</p> <p>4 - Type of Silicon: F = Fast Soft Recovery Rectifier</p> <p>5 - Voltage code: Code x 100 = V_{RRM}</p> <p>6 - S = TO-220 D²Pak (SMD-220) Version</p> <p>7 - Tape and Reel Option</p>	<p>TRL = Left Reel</p> <p>TRR = Right Orientation Reel</p>	<table border="1"> <tr> <td>02 = 200V</td> </tr> <tr> <td>04 = 400V</td> </tr> <tr> <td>08 = 800V</td> </tr> </table>	02 = 200V	04 = 400V	08 = 800V
02 = 200V					
04 = 400V					
08 = 800V					

Outline Table

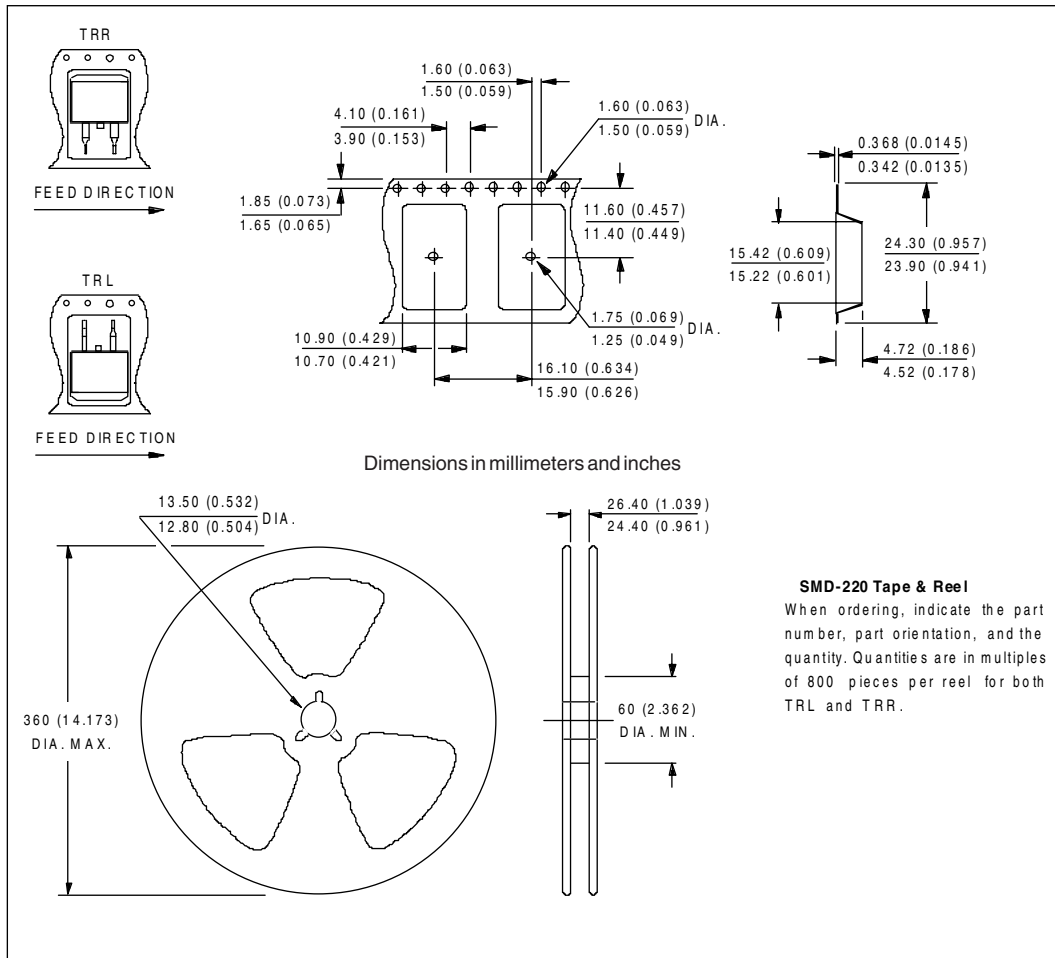
Dimensions in millimeters and inches

MINIMUM RECOMMENDED FOOTPRINT

Marking Information



Tape & Reel Information



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Data and specifications subject to change without notice.