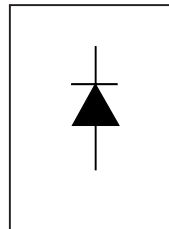


**FAST SOFT RECOVERY  
 RECTIFIER DIODE  
 Lead-Free ("PbF" suffix)**



$$V_F < 1.2V @ 10A$$

$$t_{rr} = 50ns$$

$$V_{RRM} = 600V$$

**Description/ Features**

The 10ETF06SPbF 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	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
$V_{RRM}$	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**



### 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
10ETF06SPbF	600	700	2

### Absolute Maximum Ratings

Parameters	10ETF..	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

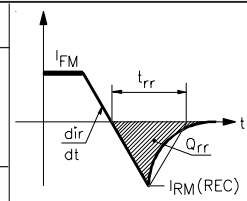
### Electrical Specifications

Parameters	10ETF..	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	$m\Omega$	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ 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..	Units	Conditions
$t_{rr}$ Reverse Recovery Time	145	ns	$I_F @ 10\text{Apk}$ @ 25A/ $\mu\text{s}$ @ 25°C
$I_{rr}$ Reverse Recovery Current	2.75	A	
$Q_{rr}$ Reverse Recovery Charge	0.32	$\mu\text{C}$	@ 25°C
S Snap Factor	0.6		



Thermal-Mechanical Specifications

Parameters	10ETF..	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 <sup>2</sup> Pak (SMD-220)		
Marking Device	10ETF06S		

\*\* When mounted on 1" square (650mm<sup>2</sup>) 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

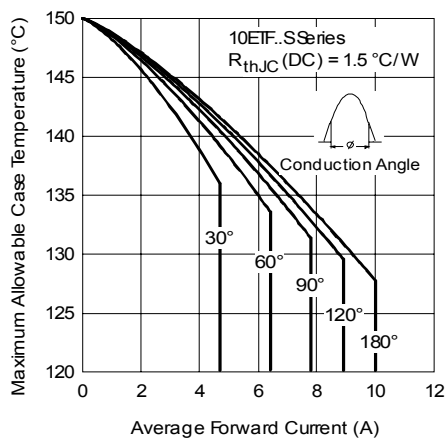


Fig. 1 - Current Rating Characteristics

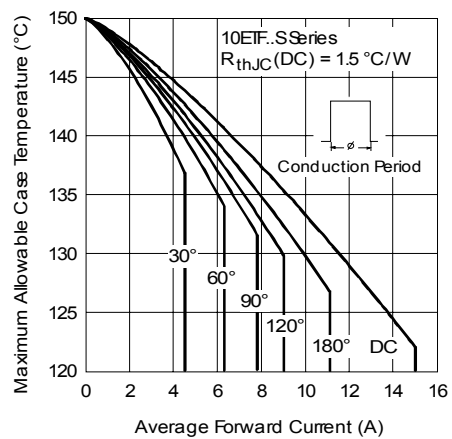


Fig. 2 - Current Rating Characteristics

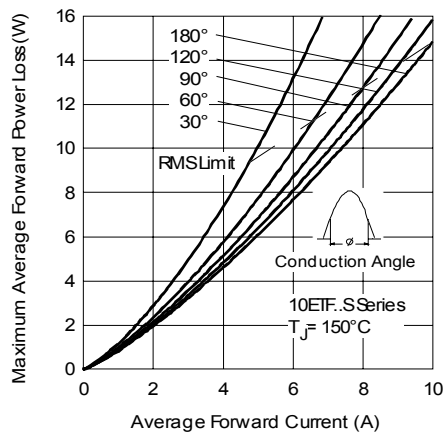


Fig. 3 - Forward Power Loss Characteristics

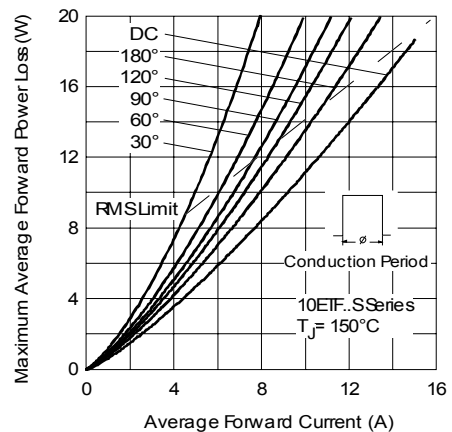


Fig. 4 - Forward Power Loss Characteristics

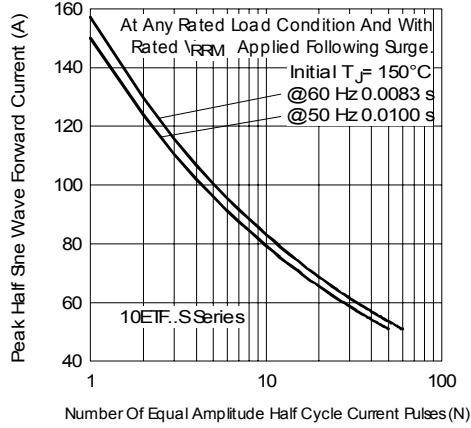


Fig. 5 - Maximum Non-Repetitive Surge Current

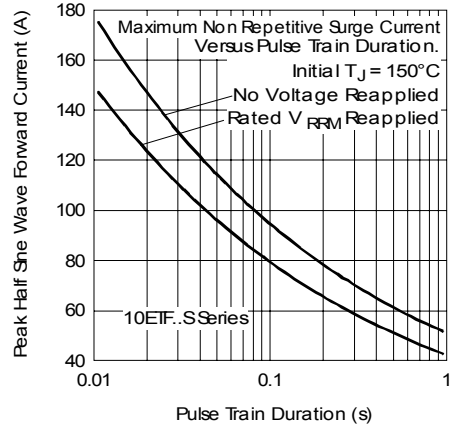


Fig. 6 - Maximum Non-Repetitive Surge Current

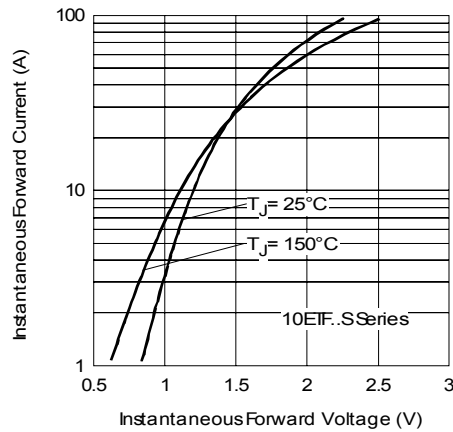


Fig. 7 - Forward Voltage Drop Characteristics

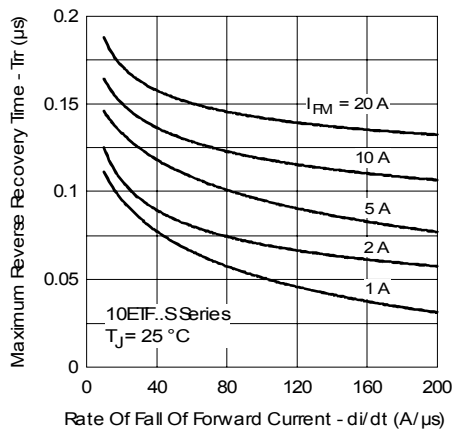


Fig. 8 - Recovery Time Characteristics,  $T_J = 25^\circ\text{C}$

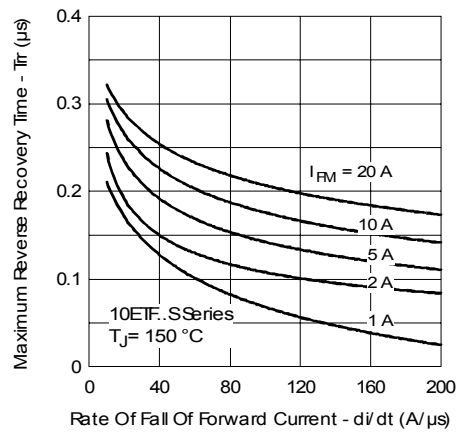


Fig. 9 - Recovery Time Characteristics,  $T_J = 150^\circ\text{C}$

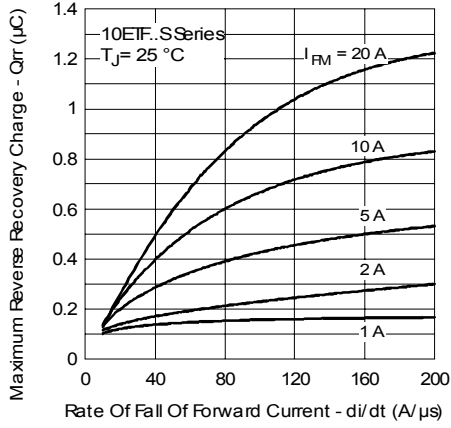


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25^\circ\text{C}$

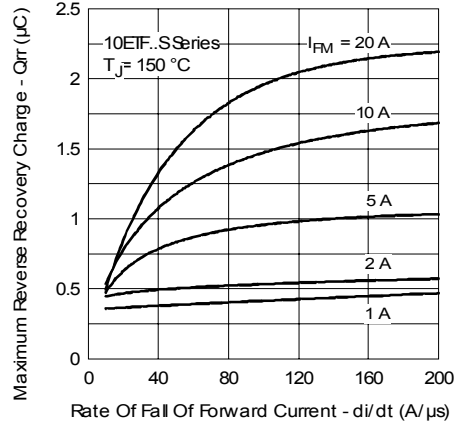


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150^\circ\text{C}$

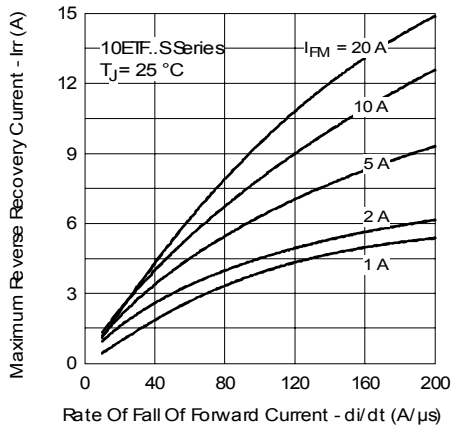


Fig. 12 - Recovery Current Characteristics,  $T_J = 25^\circ\text{C}$

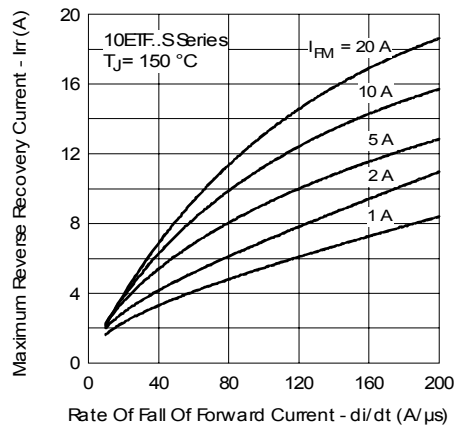


Fig. 13 - Recovery Current Characteristics,  $T_J = 150^\circ\text{C}$

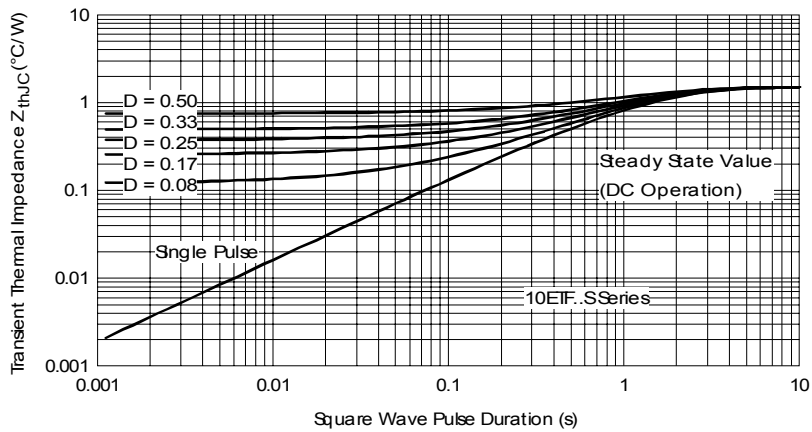
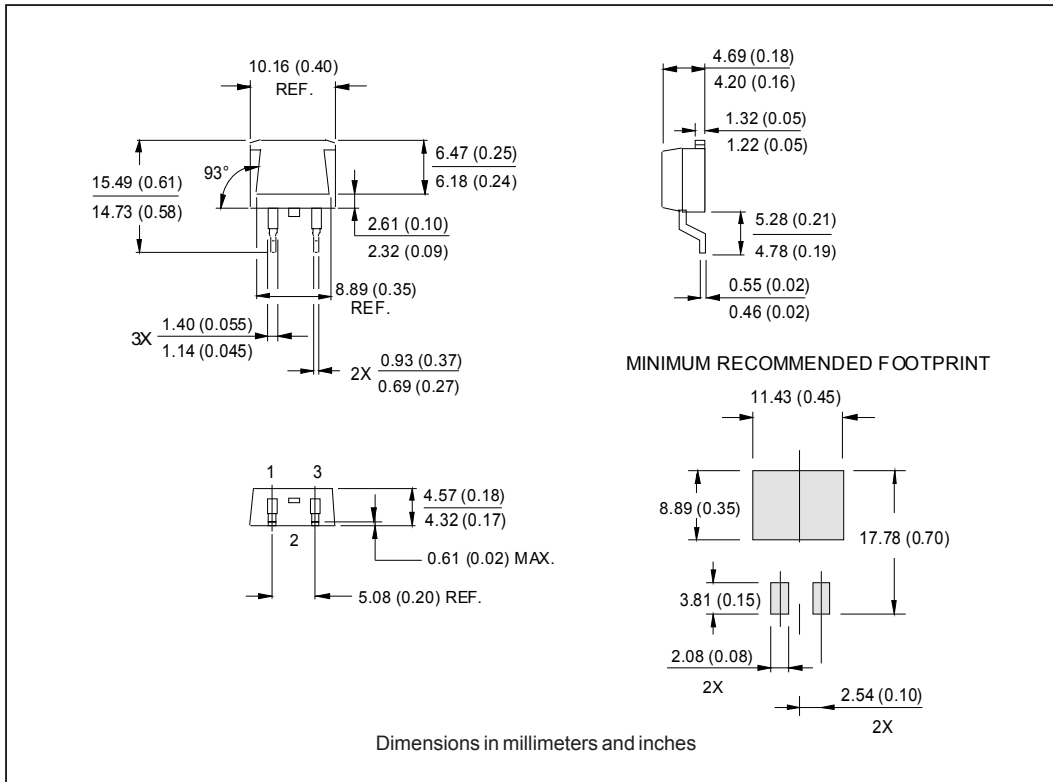
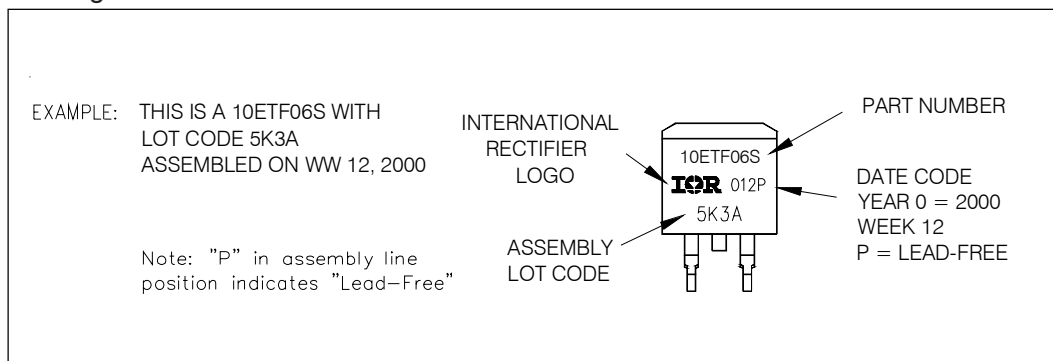


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

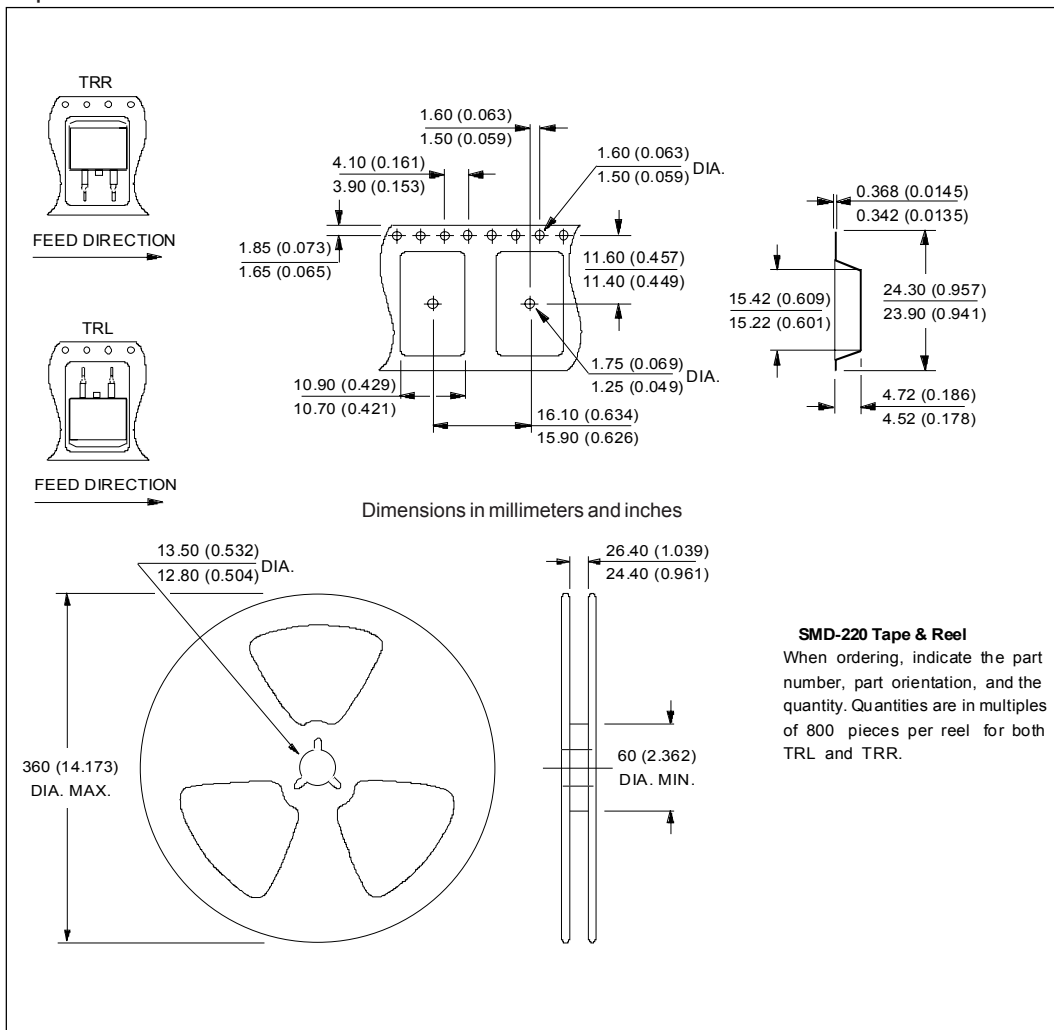
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code							
10	E	T	F	06	S	TRL	PbF
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>1</b>	-	Current Rating (10 = 10A)					
<b>2</b>	-	Circuit Configuration: E = Single Diode					
<b>3</b>	-	Package: T = D <sup>2</sup> Pak (TO-220AC)					
<b>4</b>	-	Type of Silicon: F = Fast Soft Recovery Rectifier					
<b>5</b>	-	Voltage Rating (06 = 600V)					
<b>6</b>	-	S = Surface Mountable					
<b>7</b>	-	<ul style="list-style-type: none"> <li>• none = Tube</li> <li>• TRR = Tape &amp; Reel (Right Oriented)</li> <li>• TRL = Tape &amp; Reel (Left Oriented)</li> </ul>					
<b>8</b>	-	<ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>					

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level and Lead-Free.  
Qualification Standards can be found on IR's Web site.