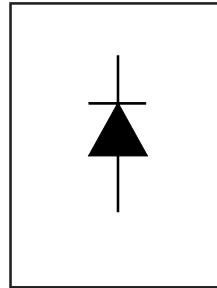


International  
**IOR** Rectifier

**SAFEIR** Series  
10ETS..FPPbF

**INPUT RECTIFIER DIODE  
TO-220 FULLPAK  
Lead-Free ("PbF" suffix)**



$$V_F < 1.1V @ 10A$$


$$I_{FSM} = 200A$$

$$V_{RRM} = 800-1200V$$

**Description/ Features**

The 10ETS12FPPbF rectifier **SAFEIR** series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150°C junction temperature.

Typical applications are in input rectification and these products are designed to be used with International Rectifier Switches and Output Rectifiers which are available in identical package outlines. Fully isolated package ( $V_{INS} = 2500 V_{RMS}$ ).

UL E78996 approved 

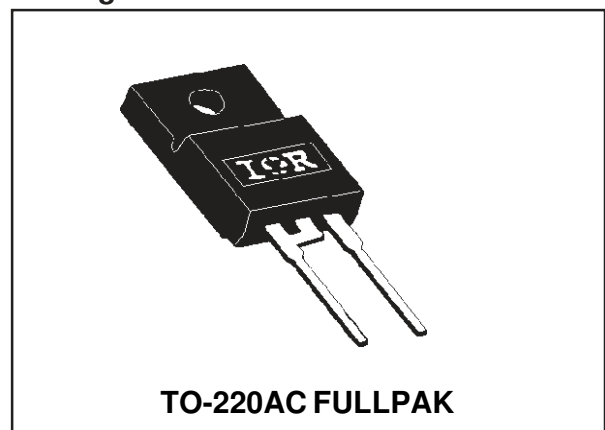
**Output Current in Typical Applications**

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter $T_A = 55^\circ C, T_J = 125^\circ C$ common heatsink of $1^\circ C/W$	12.0	16.0	A

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
$V_{RRM}$ Range	800-1200	V
$I_{FSM}$	200	A
$V_F$ @10A, $T_J = 25^\circ C$	1.1	V
$T_J$	-40to150	$^\circ C$

**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
10ETS12FPPbF	1200	1300	0.5
10ETS08FPPbF	800	900	0.5

### Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	10	A	@ $T_C = 105^\circ\text{C}$ , 180° conduction half sine wave
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	170	A	10ms Sine pulse, rated $V_{RRM}$ applied
	200		10ms Sine pulse, no voltage reapplied
$I^2t$ Max. $I^2t$ for fusing	130	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	145		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1450	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied

### Electrical Specifications

Parameters	Values	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.1	V	@ 10A, $T_J = 25^\circ\text{C}$
$r_t$ Forward slope resistance	20	$m\Omega$	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.82	V	
$I_{RM}$ Max. Reverse Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$
	0.50		$T_J = 150^\circ\text{C}$

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

### Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
$T_J$ Max. Junction Temperature Range	-40 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-40 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	2.5	$^\circ\text{C/W}$	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	62	$^\circ\text{C/W}$	
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.5	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	$\text{Kg-cm}$ (lbf-in)
	Max.	12 (10)	
Case Style	TO-220 FULLPAK		(94/V0)

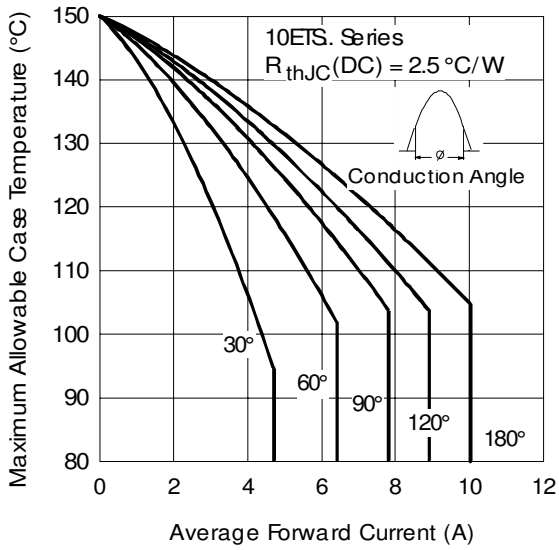


Fig. 1 - Current Rating Characteristics

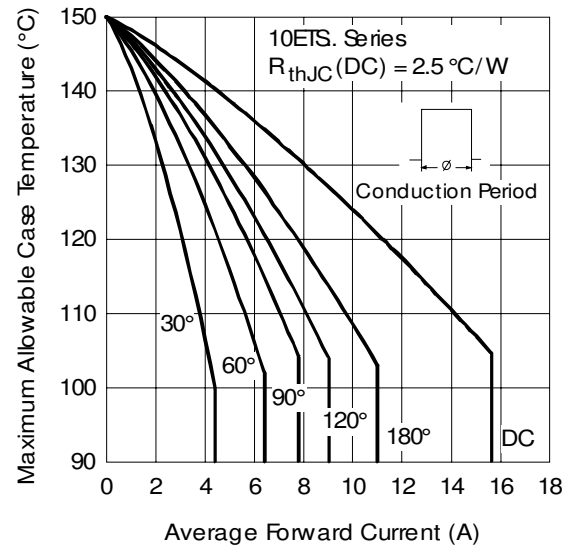


Fig. 2 - Current Rating Characteristics

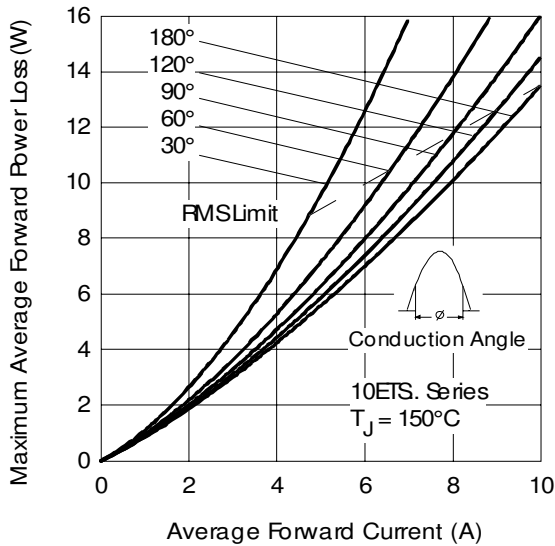


Fig. 3 - Forward Power Loss Characteristics

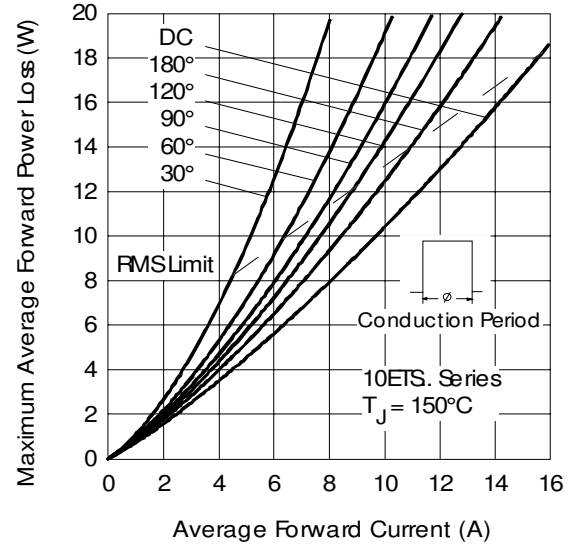


Fig. 4 - Forward Power Loss Characteristics

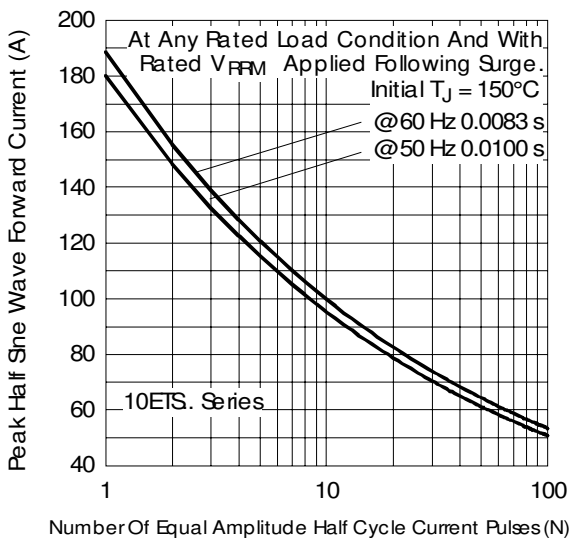


Fig. 5 - Maximum Non-Repetitive Surge Current

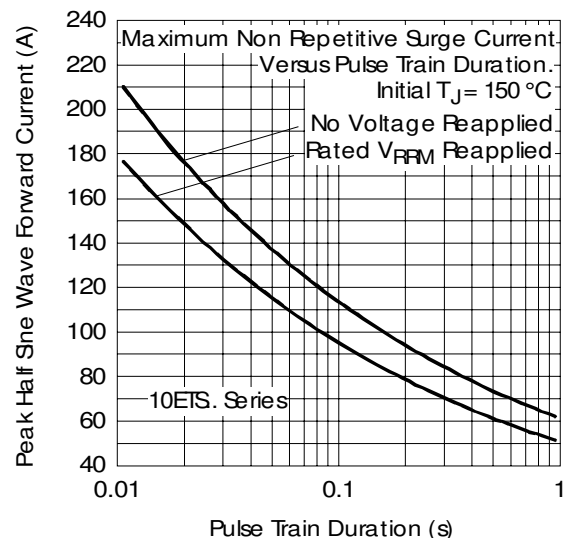


Fig. 6 - Maximum Non-Repetitive Surge Current

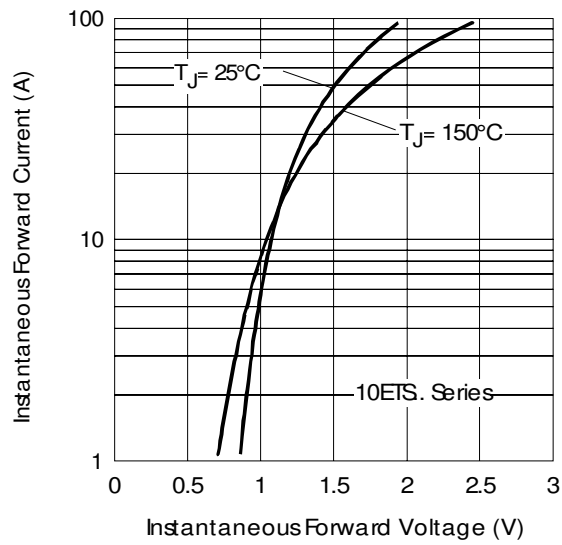


Fig. 8 - Forward Voltage Drop Characteristics

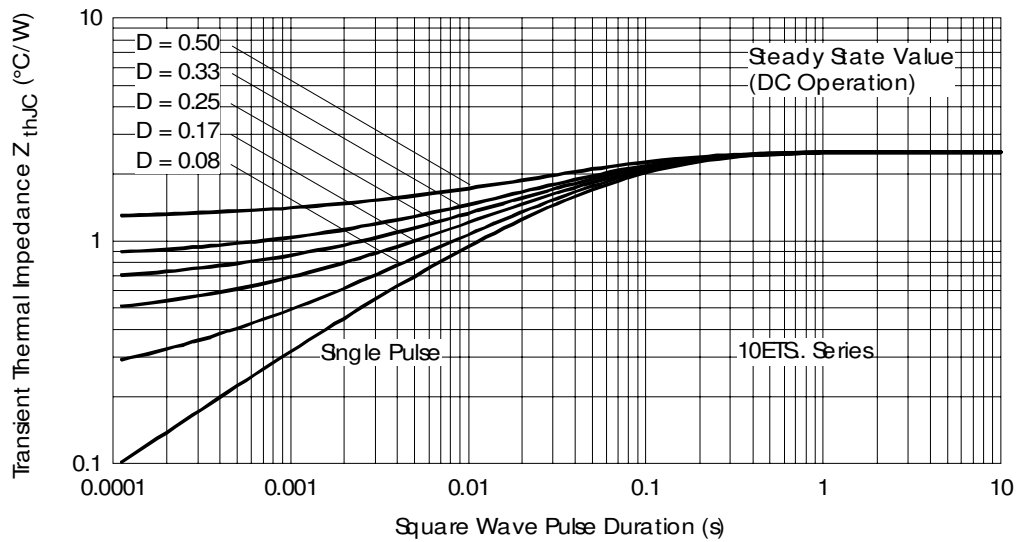
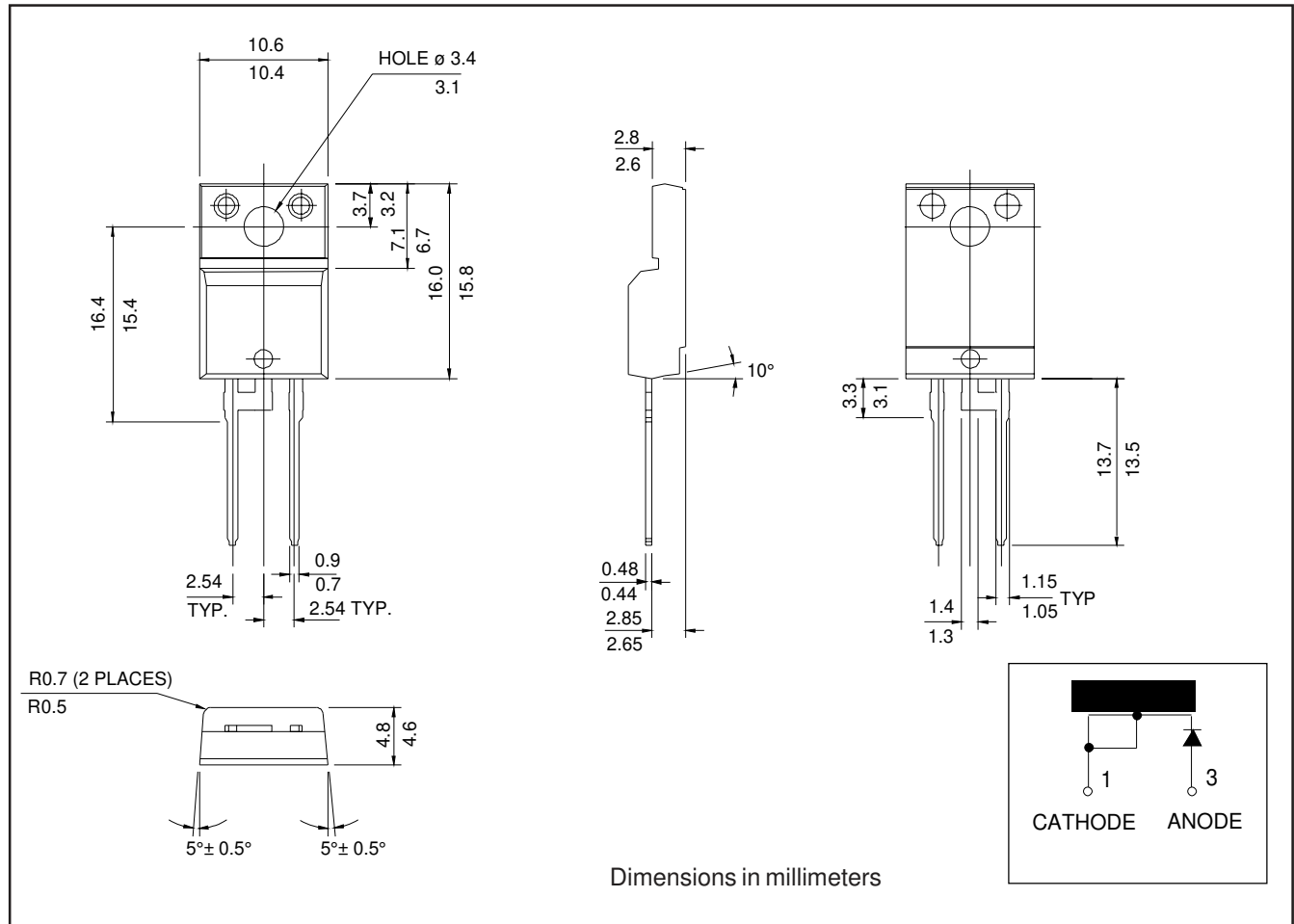
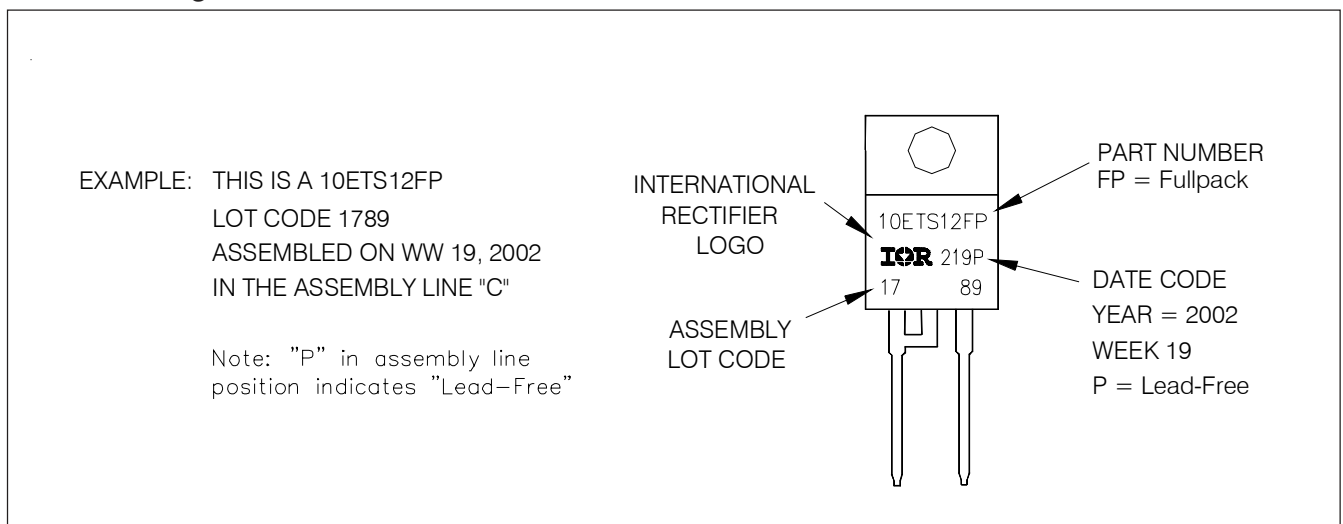


Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

Outline Table



Part Marking Information



Ordering Information Table

Device Code						
1	2	3	4	5	6	7
10	E	T	S	12	FP	PbF
1	-	Current Rating (10 = 10A)				
2	-	Circuit Configuration:				
		E = Single Diode				
3	-	Package:				
		T = TO-220AC				
4	-	Type of Silicon:				
		S = Standard Recovery Rectifier				
5	-	Voltage Rating				
		12 = 1200V				
		08 = 800V				
6	-	Fullpak				
7	-	• none = Standard Production				
		• PbF = Lead-Free				

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.



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