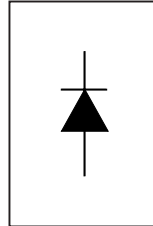


International
IR Rectifier

SAFEIR Series 10ETS12SPbF

INPUT RECTIFIER DIODE
 Lead-Free ("PbF" suffix)



$$V_F < 1V @ 10A$$

$$I_{FSM} = 200A$$

$$V_{RRM} = 1200V$$

Description/ Features

The 10ETS12SPbF 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.

Output Current in Typical Applications

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

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM}	1200	V
I_{FSM}	200	A
V_F @ 10A, $T_J = 25^\circ\text{C}$	1.1	V
T_J	-40 to 150	$^\circ\text{C}$

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
10ETS12SPbF	1200	1300	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	$^\circ\text{C}/\text{W}$	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient (PCB Mount)*	62	$^\circ\text{C}/\text{W}$	
T_s Soldering Temperature	240	$^\circ\text{C}$	
wt Approximate Weight	2 (0.07)	g (oz.)	
Case Style	D ² Pak (SMD-220)		
Device Marking	10ETS12S		

* When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4 oz (140 μm) copper 40 $^\circ\text{C}/\text{W}$
For recommended footprint and soldering techniques refer to application note #AN-994

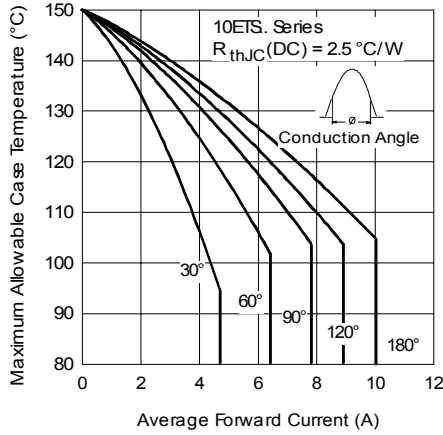


Fig. 1 - Current Rating Characteristics

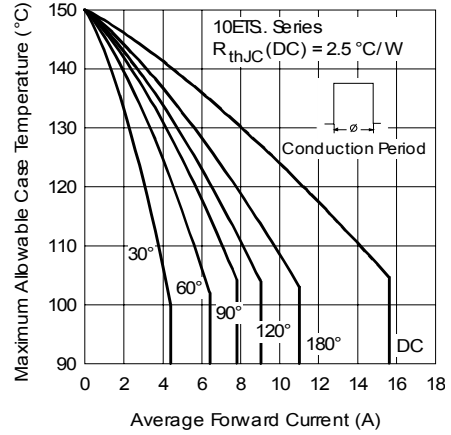


Fig. 2 - Current Rating Characteristics

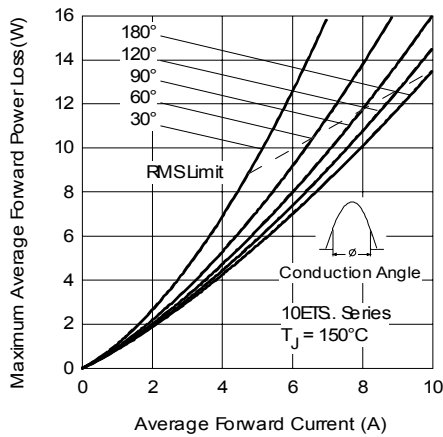


Fig. 3 - Forward Power Loss Characteristics

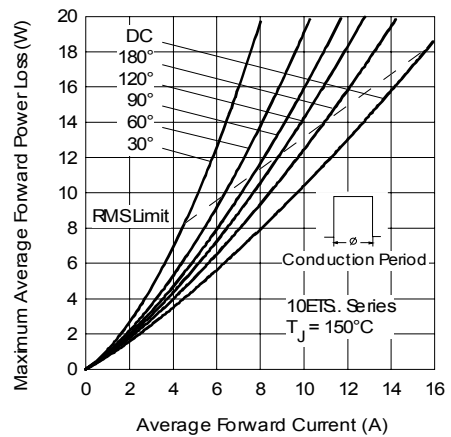


Fig. 4 - Forward Power Loss Characteristics

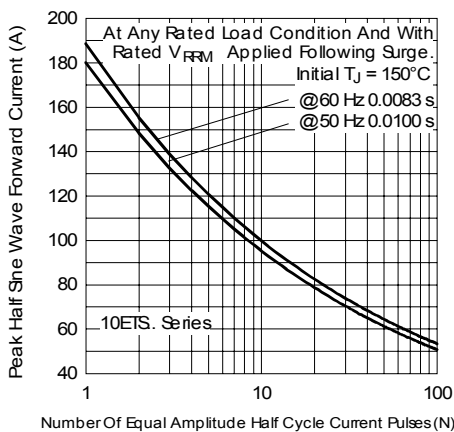


Fig. 5 - Maximum Non-Repetitive Surge Current

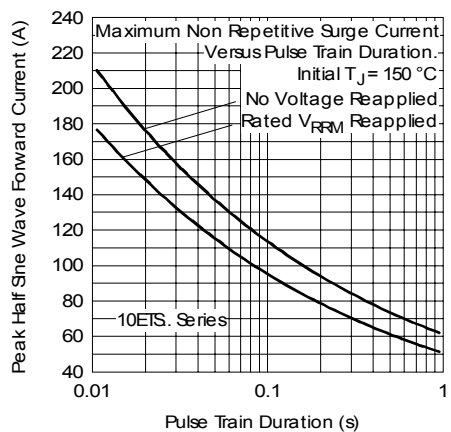


Fig. 6 - Maximum Non-Repetitive Surge Current

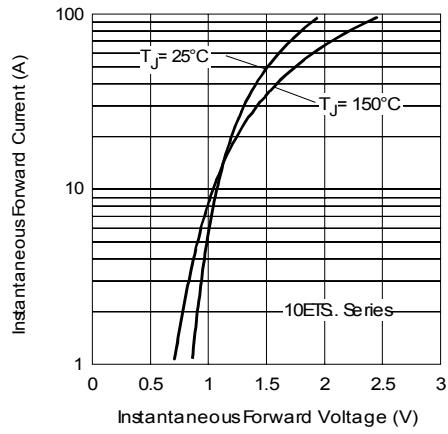


Fig. 8 - Forward Voltage Drop Characteristics

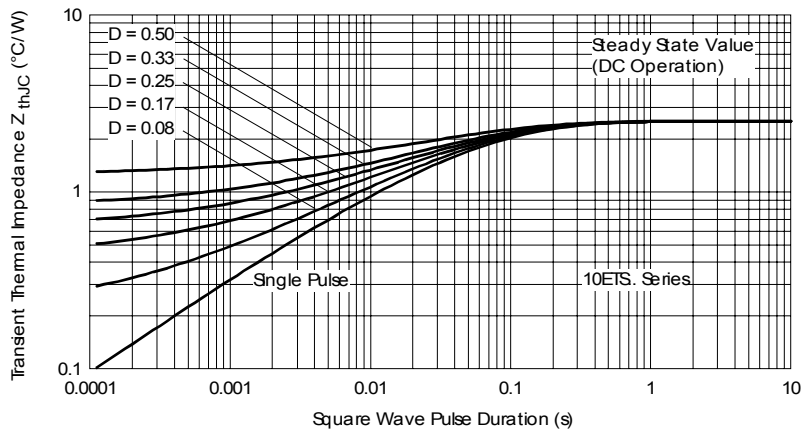
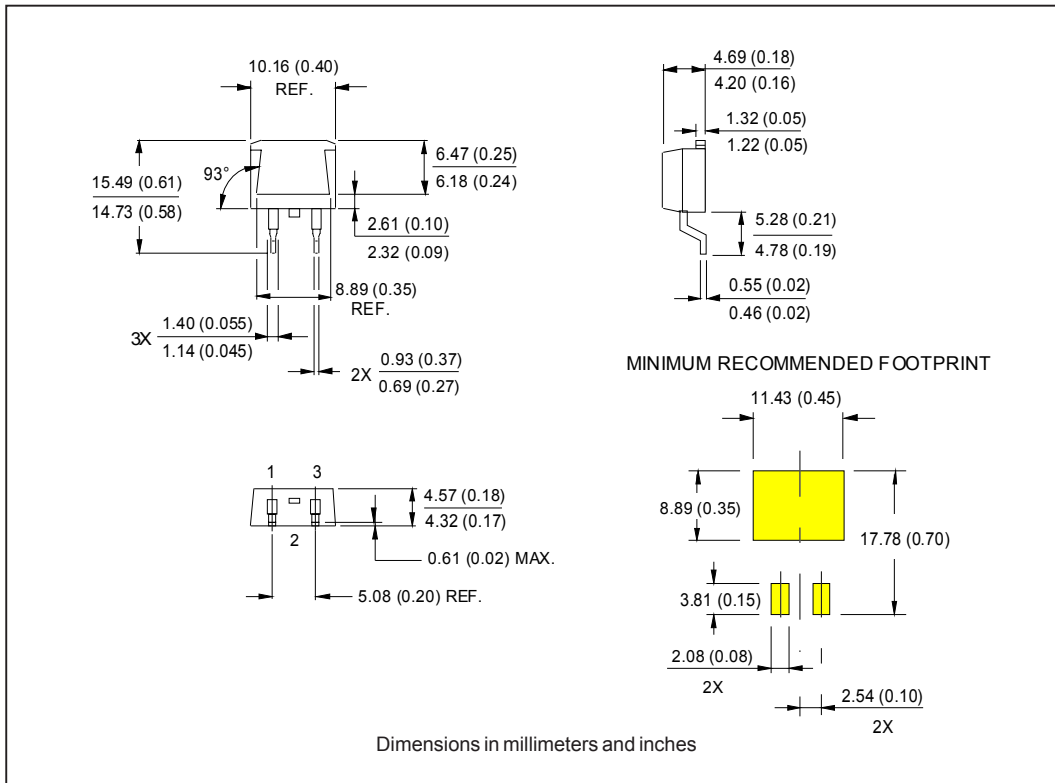
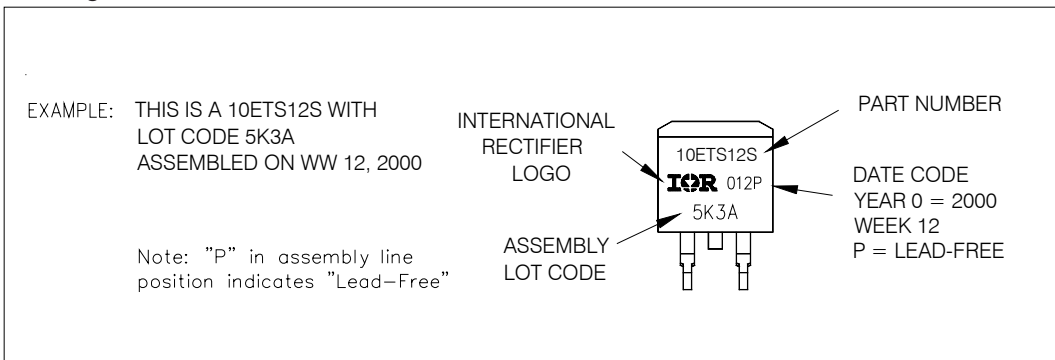


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

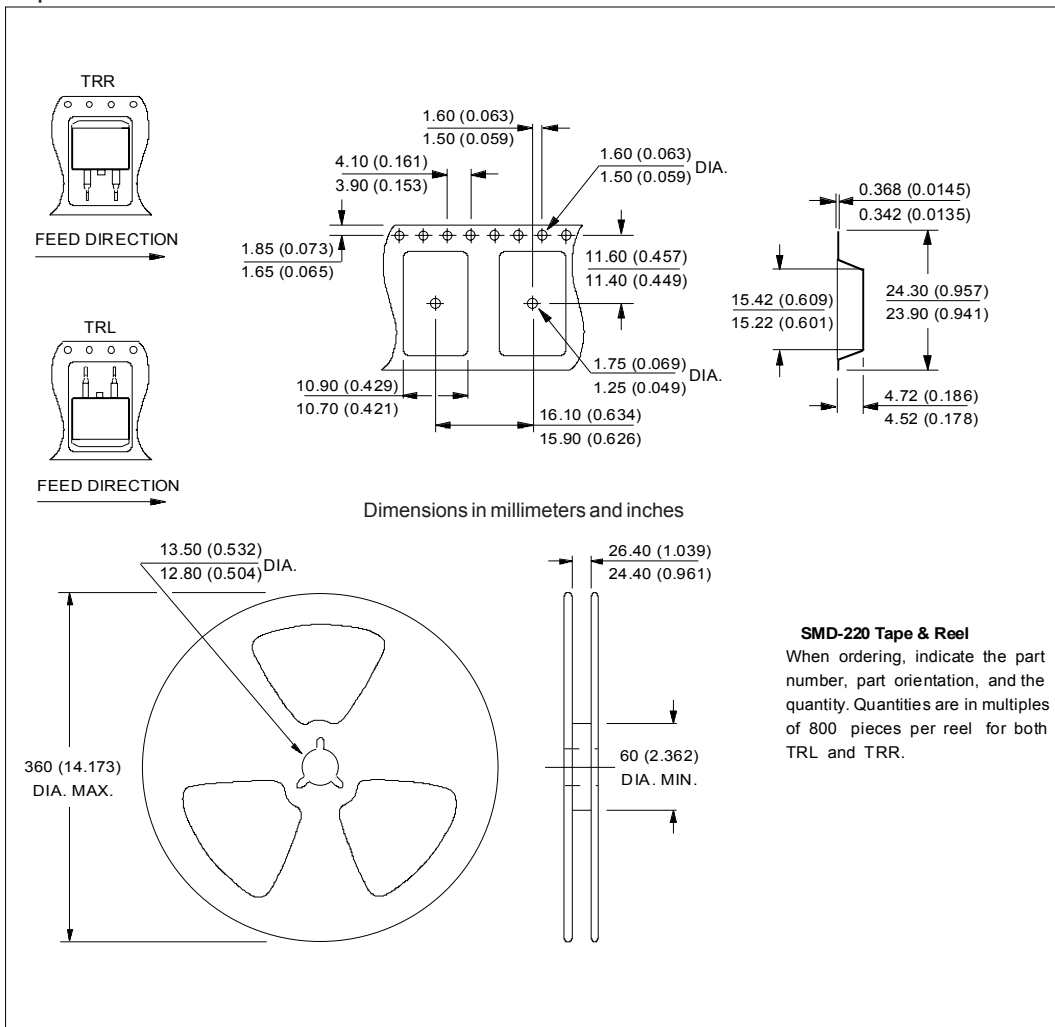
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code																	
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">10</td> <td style="padding: 5px;">E</td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">12</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">TR</td> <td style="padding: 5px;">PbF</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> <td style="text-align: center;">⑧</td> </tr> </table>	10	E	T	S	12	S	TR	PbF	①	②	③	④	⑤	⑥	⑦	⑧
10	E	T	S	12	S	TR	PbF										
①	②	③	④	⑤	⑥	⑦	⑧										
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)																
6	- S = TO-220 D ² Pak (SMD-220) Version																
7	- <ul style="list-style-type: none"> • none = Tube • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented) 																
8	- <ul style="list-style-type: none"> • 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.