

International
IR Rectifier

SAFEIR Series
8EWS..SPbF


**SURFACE MOUNTABLE
INPUT RECTIFIER DIODE
Lead-Free ("PbF" suffix)**

Description/ Features

The 8EWS..SPbF 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.

The **High Reverse Voltage** range available allows design of input stage primary rectification with **Outstanding Voltage Surge** capability.

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.

	$V_F < 1V @ 10A$
	$I_{FSM} = 200A$
	$V_{RRM} = 800V, 1200V$

Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz (140µm) copper	1.2	1.6	A
Aluminum IMS, $R_{thCA} = 15^{\circ}C/W$	2.5	2.8	
Aluminum IMS with heatsink, $R_{thCA} = 5^{\circ}C/W$	5.5	6.5	

$T_A = 55^{\circ}C, T_J = 125^{\circ}C, \text{footprint } 300\text{mm}^2$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM}	800, 1200	V
I_{FSM}	200	A
$V_F @ 10A, T_J = 25^{\circ}C$	1.10	V
T_J	-40 to 150	°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
8EWS08SPbF	800	900	0.5
8EWS12SPbF	1200	1300	

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^2vt Max. I^2vt for fusing	1450	A^2/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	$^\circ\text{C}$	
	Soldering Temperature	240	$^\circ\text{C}$
R_{thJC} Max. Thermal Resistance Junction to Case	2.5	$^\circ\text{C/W}$	DC operation
R_{thJA} Typ. Thermal Resistance Junction to Ambient (PCB Mount)**	62	$^\circ\text{C/W}$	
wt Approximate Weight	1(0.03)	g(oz.)	
T Case Style	TO-252AA (D-PAK)		

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

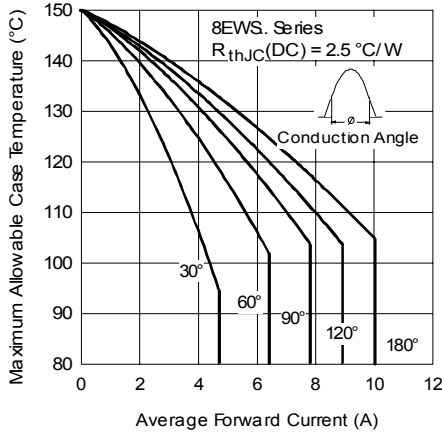


Fig. 1 - Current Rating Characteristics

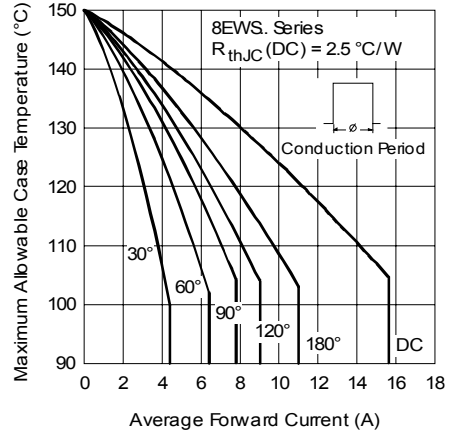


Fig. 2 - Current Rating Characteristics

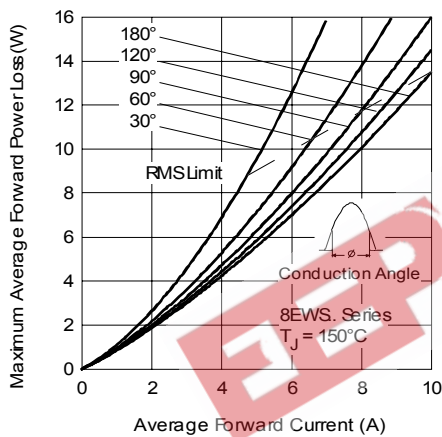


Fig. 3 - Forward Power Loss Characteristics

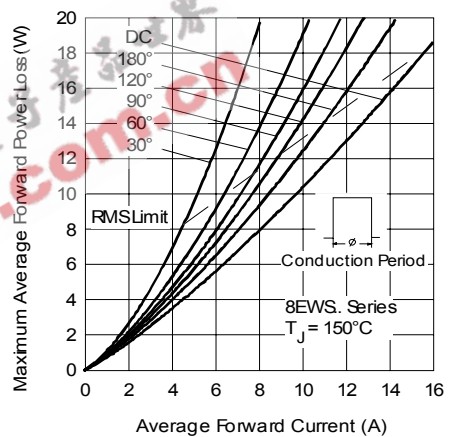


Fig. 4 - Forward Power Loss Characteristics

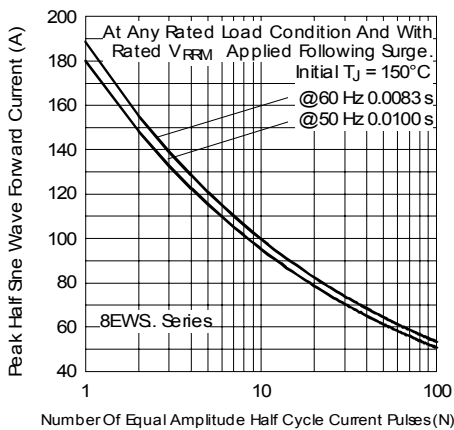


Fig. 5 - Maximum Non-Repetitive Surge Current

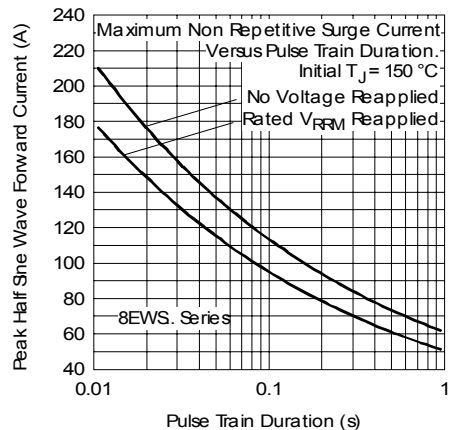


Fig. 6 - Maximum Non-Repetitive Surge Current

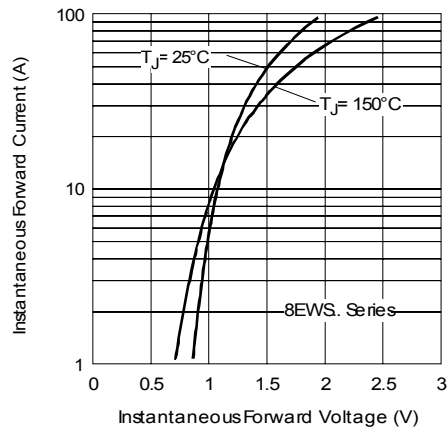


Fig. 8 - Forward Voltage Drop Characteristics

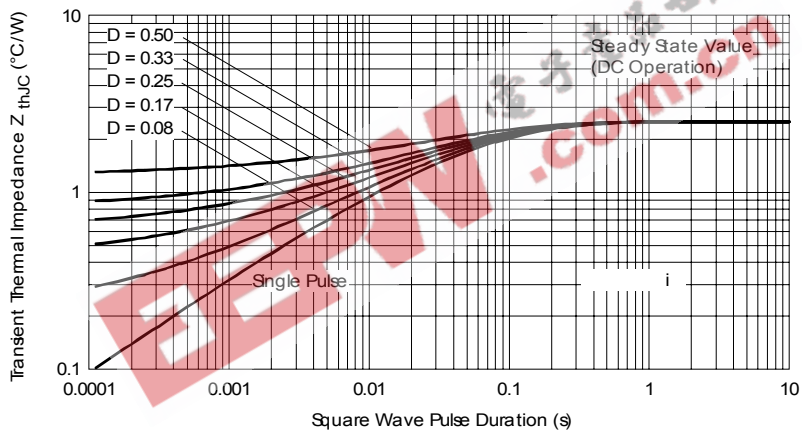
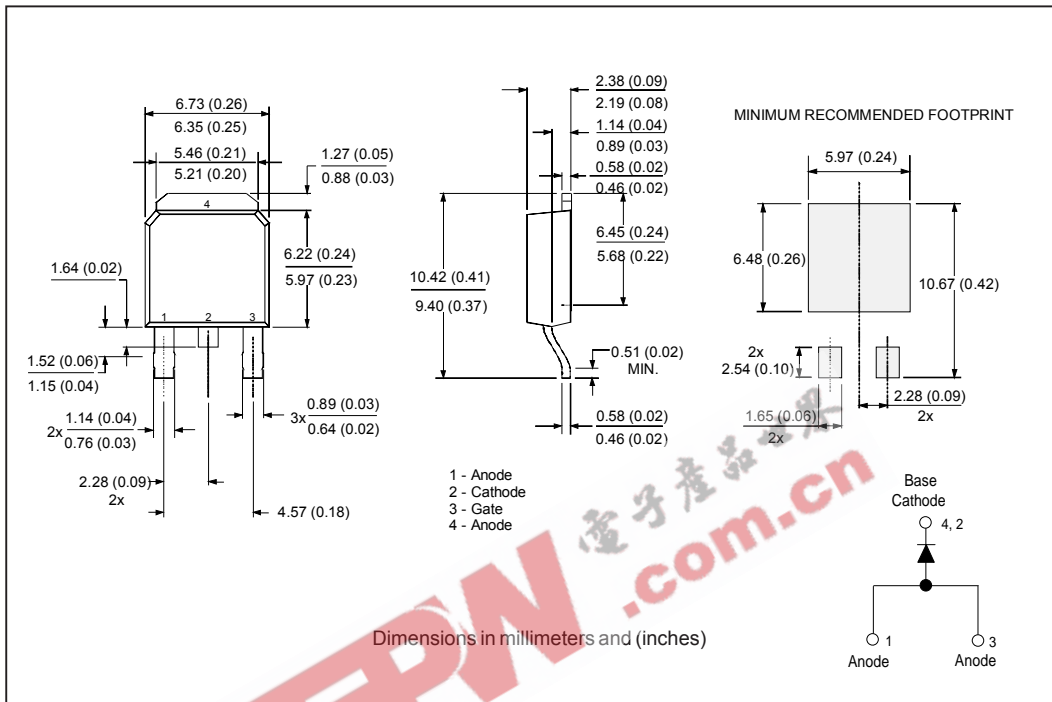
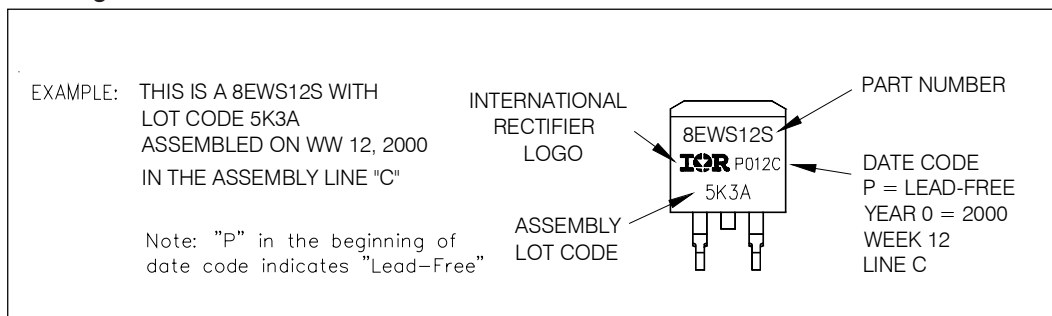


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

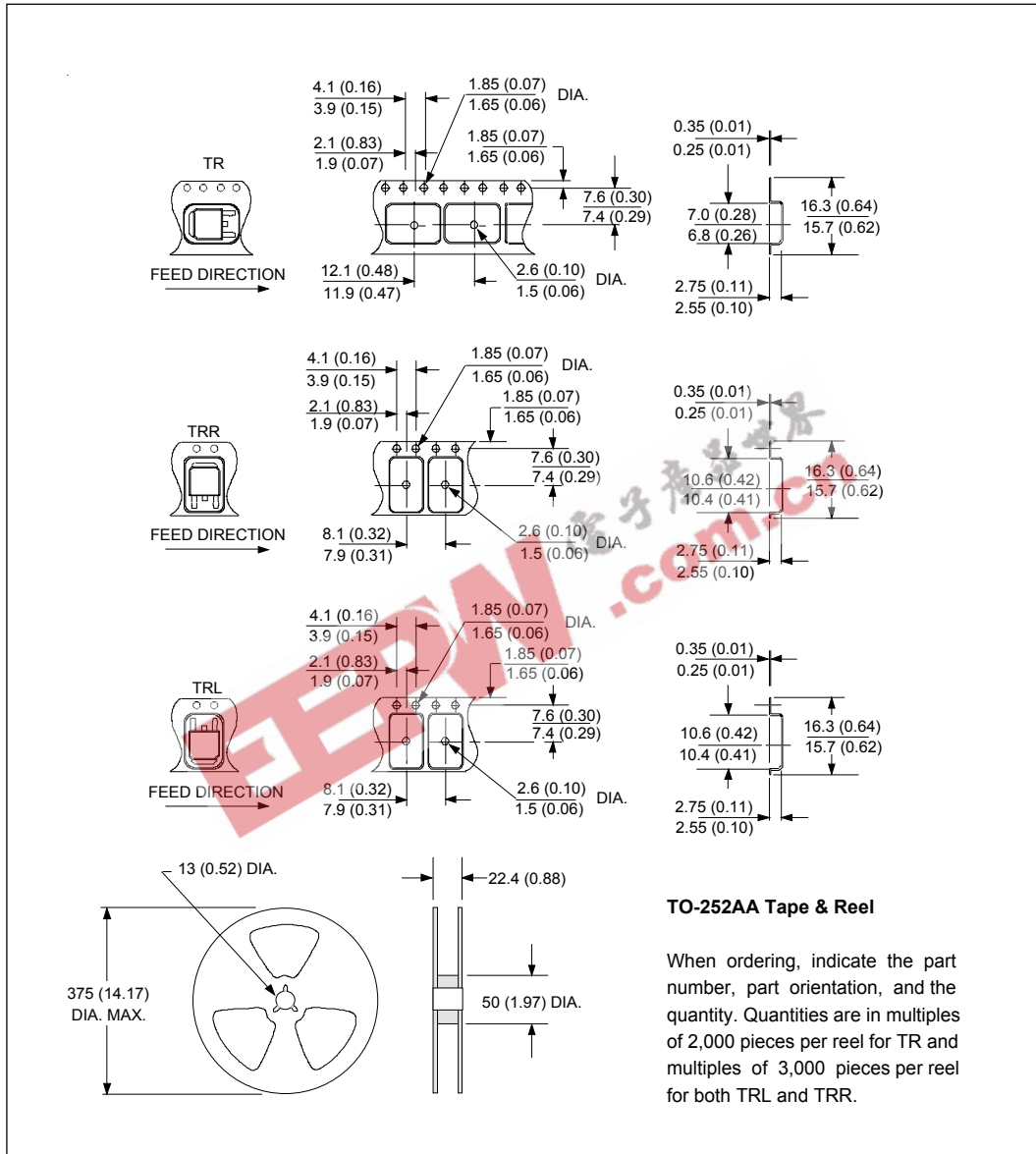
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code							
8	E	W	S	12	S	TR	PbF
①	②	③	④	⑤	⑥	⑦	⑧
1	-	Current Rating (8 = 8A)					
2	-	Circuit Configuration: E = Single Diode					
3	-	Package: W = D-Pak					
4	-	Type of Silicon: S = Standard Recovery Rectifier					
5	-	Voltage Ratings					
6	-	S = Surface Mountable					
7	-	<ul style="list-style-type: none"> • TR = Tape & Reel • TRR = Tape & Reel (Right Oriented) • TRL = Tape & Reel (Left 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.