


International
IR Rectifier

SAFEIR Series
8EWS..SPbF

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

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

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.

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	

$T_A = 55^{\circ}C$, $T_J = 125^{\circ}C$, footprint 300mm²

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 μm) copper 40 $^\circ\text{C/W}$
For recommended footprint and soldering techniques refer to application note #AN-994

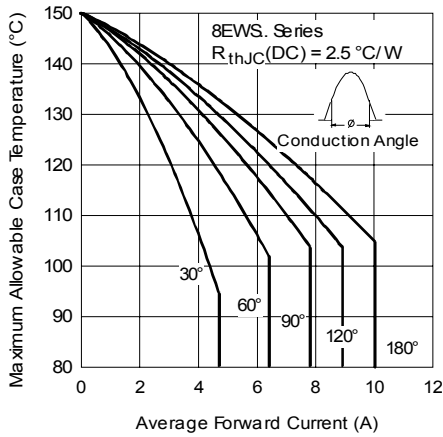


Fig. 1 - Current Rating Characteristics

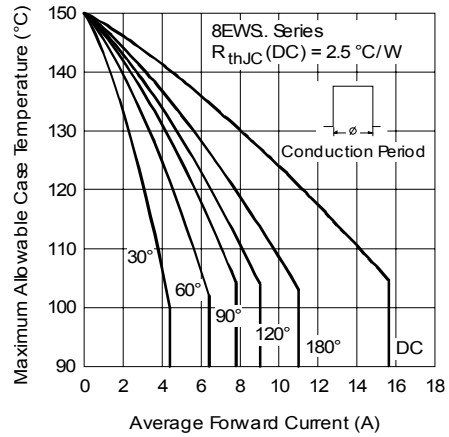


Fig. 2 - Current Rating Characteristics

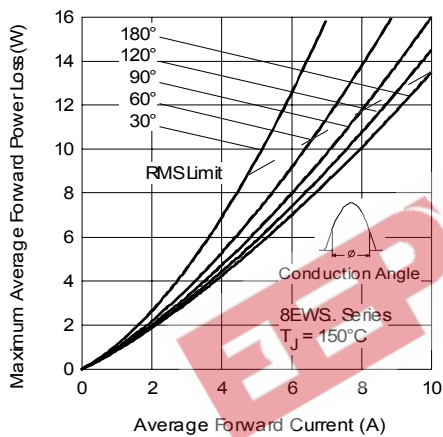


Fig. 3 - Forward Power Loss Characteristics

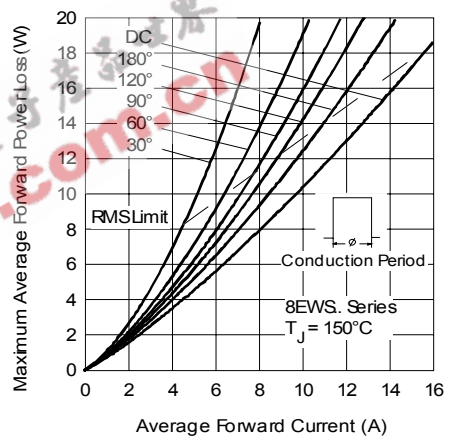


Fig. 4 - Forward Power Loss Characteristics

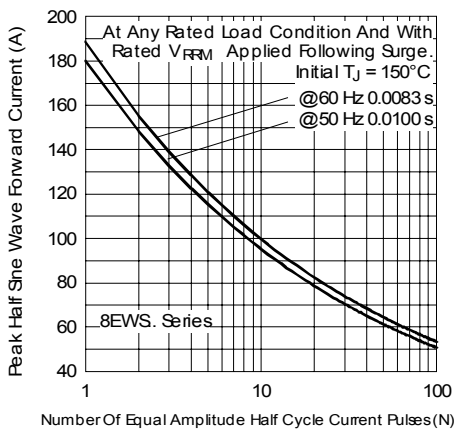


Fig. 5 - Maximum Non-Repetitive Surge Current

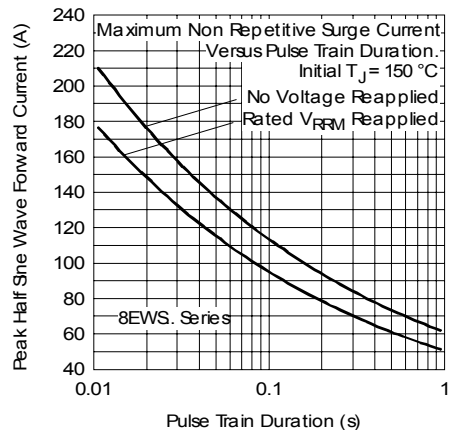


Fig. 6 - Maximum Non-Repetitive Surge Current

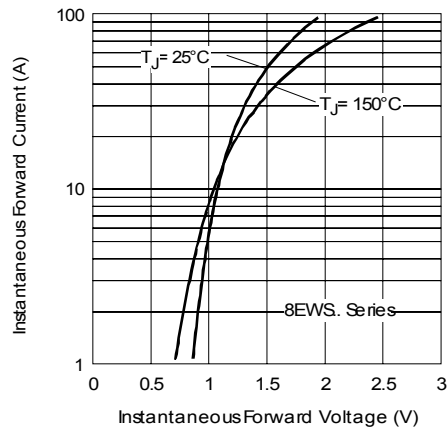


Fig. 8 - Forward Voltage Drop Characteristics

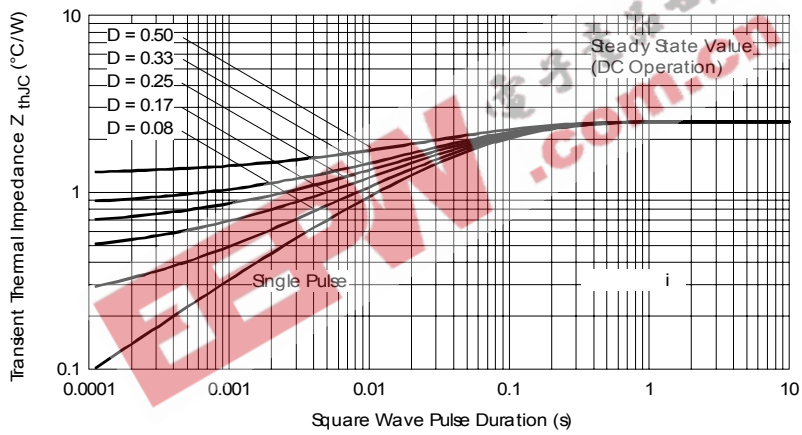
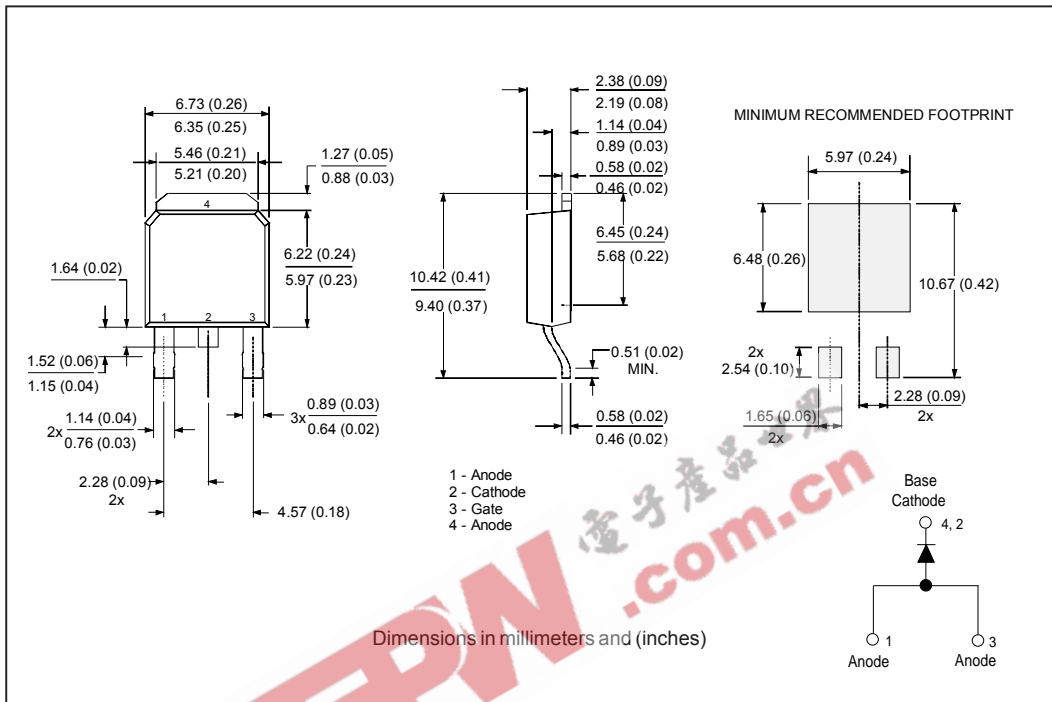
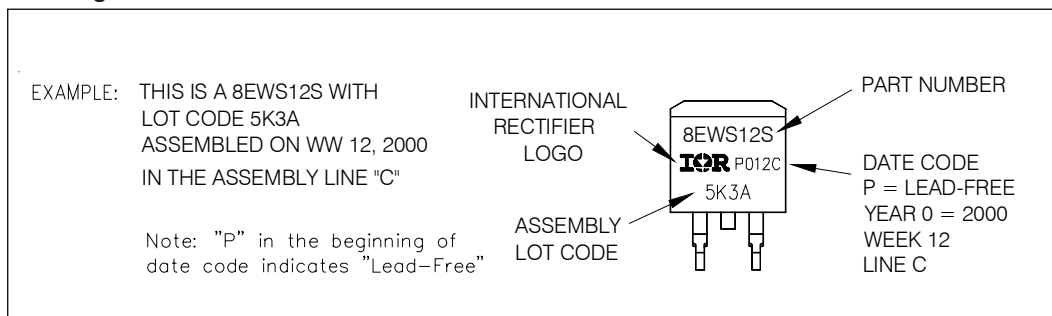


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

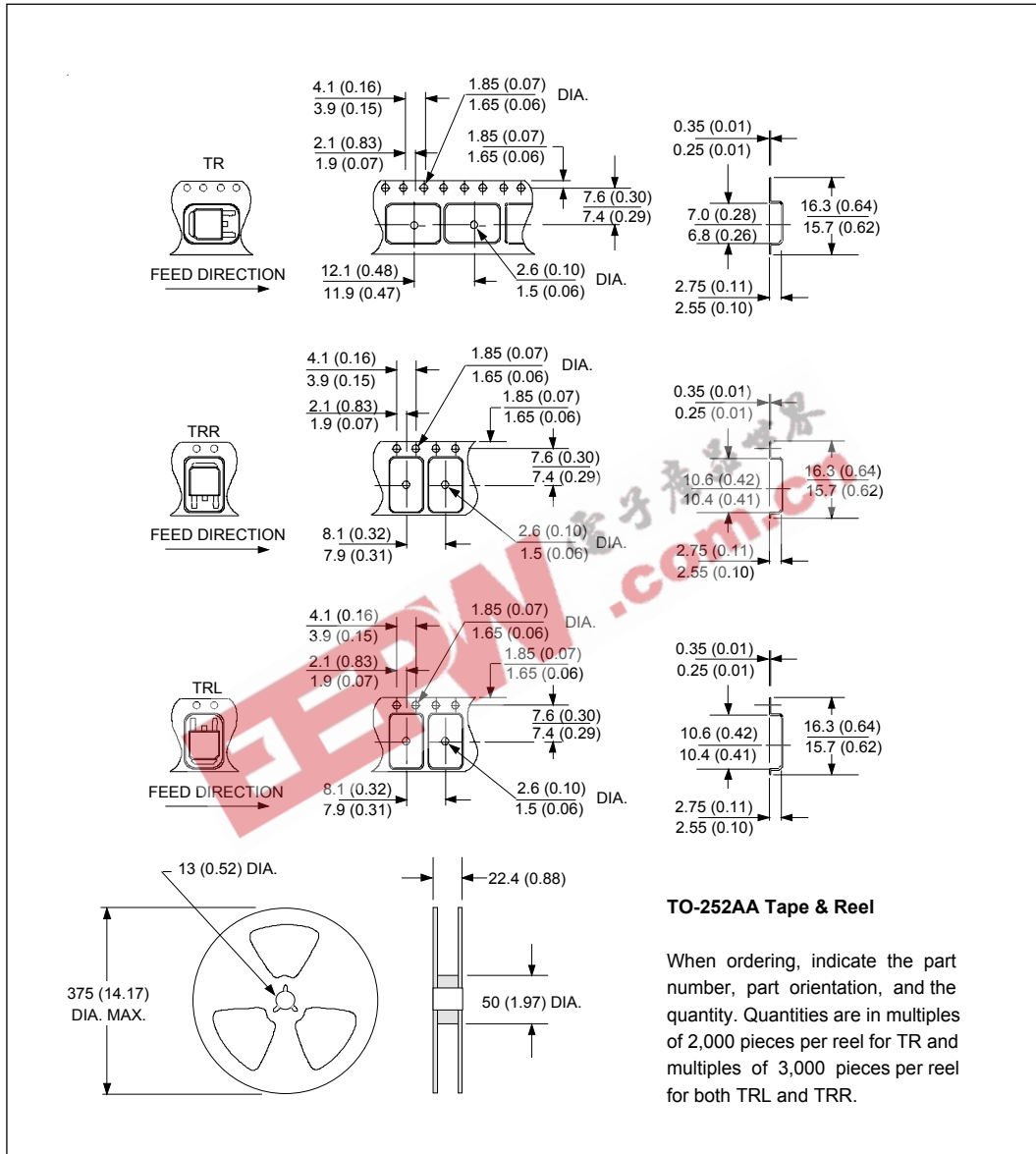
Outline Table



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

<p>1 - Current Rating (8 = 8A)</p> <p>2 - Circuit Configuration: E = Single Diode</p> <p>3 - Package: W = D-Pak</p> <p>4 - Type of Silicon: S = Standard Recovery Rectifier</p> <p>5 - Voltage Ratings</p> <p>6 - S = Surface Mountable</p> <p>7 -</p> <ul style="list-style-type: none"> • TR = Tape & Reel • TRR = Tape & Reel (Right Oriented) • TRL = Tape & Reel (Left Oriented) <p>8 -</p> <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free 	<table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">08 = 800V</td> </tr> <tr> <td style="padding: 2px;">12 = 1200V</td> </tr> </table>	08 = 800V	12 = 1200V
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12 = 1200V			

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.