Preliminary Data Sheet I20263 rev. D 09/99

International
IOR Rectifier

9AF.. SERIES

PRESSFIT STANDARD RECOVERY DIODES

50 A

Features

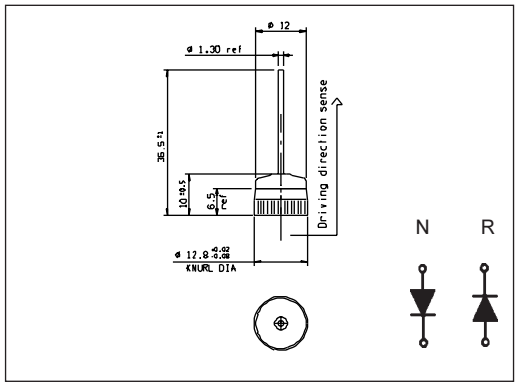
- Voltage Rating up to 600 V
- High Surge Current Capability
- Simplified design and rapid assembly
- Terminals suitable for
  Crimping
  Clamping
  Welding
  Soldering

Description

These 9AF series devices are standard recovery power rectifier diodes. Mechanical design are greatly simplified giving advantages to application.
Applications, include welders, battery chargers and general industrial current rectification.

Major Ratings and Characteristics

Parameters		Values	Units
$I_{F(AV)}$		50	A
	@T_C	150	°C
$I_{F(RMS)}$		79	A
I_{FSM}	@50Hz	850	A
	@60Hz	900	A
I^2t	@50Hz	3977	A^2s
	@60Hz	3631	A^2s
$I^2\sqrt{t}$		39775	$A^2\sqrt{s}$
V_{RRM}		400/600	V
T_J		-55 to 175	°C



Mounting - PRESSFIT

- Use standard aluminium heatsink of minimum thickness 3 +/- 0.1 mm to obtain specified performance
- Drill a hole of diameter 12.65 + 0,03 mm (0,498 to 0,499 inch) in the heatsink
- Remove the burrs and sharp edges around the hole diameter
- Ensure that axis of the diodes are aligned with axis of the hole
- The diodes are designed for press fitted mounting from the rear side of the aluminium heatsink as indicated in the lay out figure
- The pressing force must be 1000 Kgs +/- 10% per diode.

Mounting - with SOLDER

- Base to Heatsink
- Lead Terminal to Tag, Lug or wire

Suggested Soldering Conditions :

- Equipment : Hot Plate, Solder Iron & Reflow Furnace
- Solder : Composition Pb/Sn EUTECTIK
  Solder Paste with Flux type - RMA or RA or RSA
  Solder Preform
  Solder Wire
- Temperature : 230°C Max.
- Duration : Time limit max 5 minute from 190°C to 230°C to 190°C
- Atmosphere : Air

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	V_{RRM}, maximum repetitive peak reverse voltage V	V_{RSM}, maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = T_J$ max mA
9AF40	400	500	10
9AF60	600	700	10

Forward Conduction

	Parameter	9AF	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	50	A	180° conduction, half sine wave		
	@ Case temperature	150	°C			
$I_{F(RMS)}$	Max. peak repetitive forward current	79	A			
	@ Case temperature	150	°C			
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	850	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		900		t = 8.3ms		
		750		t = 10ms	100% V_{RRM} reapplied	
		785		t = 8.3ms		
I^2t	Maximum I^2t for fusing	3977	A^2s	t = 10ms	No voltage reapplied	
		3631		t = 8.3ms		
		2813		t = 10ms	100% V_{RRM} reapplied	
		2568		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	39775	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.72	V	T_J = 175°		
$V_{F(TO)2}$	High level value of threshold voltage	0.84				
r_{f1}	Low level value of forward slope resistance	3.29	mΩ			
r_{f2}	High level value of forward slope resistance	2.67				
V_{FM}	Maximum forward voltage drop	1.33	V	T_J = 25°C, I = 157 A		

Thermal and Mechanical Specifications

	Parameter	9AF	Units	Conditions
T_J	Max. junction operating temperature range	- 55 to 175	°C	
T_{stg}	Storage temperature range	- 55 to 175		
R_{thJC}	Max. thermal resistance, junction to case	0.30	K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.14		As per mounting details
wt	Approximate weight	6	g	

Ordering Information Table

Device Code

9AF	60	N
1	2	3

1 - Essential part number

2 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings Table)

3 - N = Normal Polarity (cathode to case)
R = Reverse Polarity (anode to case)

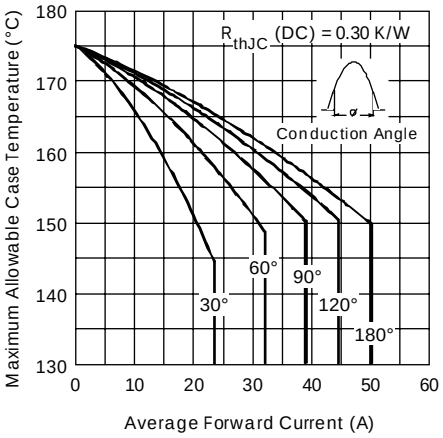


Fig. 1 - Current Ratings Characteristics

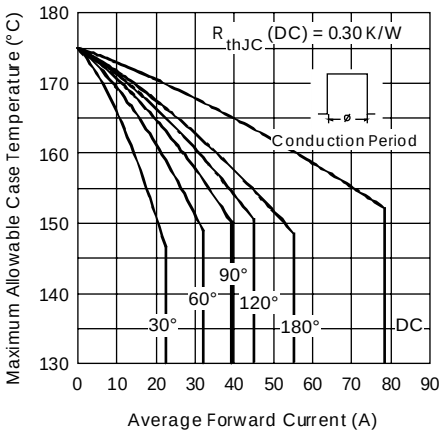


Fig. 2 - Current Ratings Characteristics

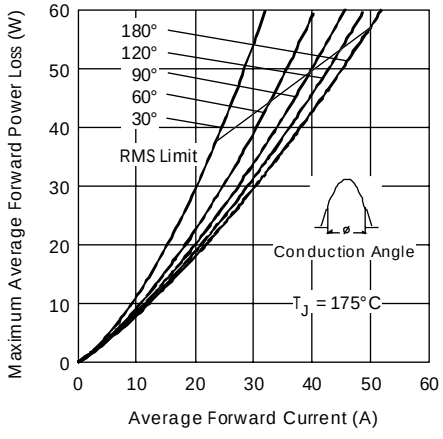


Fig. 3 - Forward Power Loss Characteristics

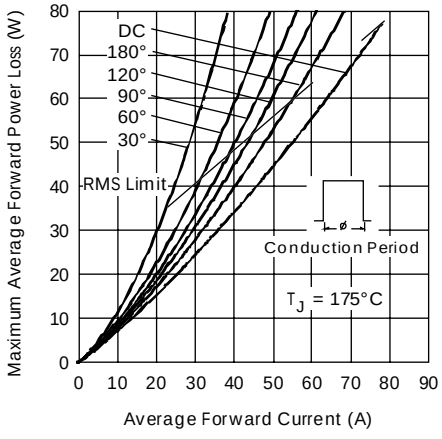


Fig. 4 - Forward Power Loss Characteristics

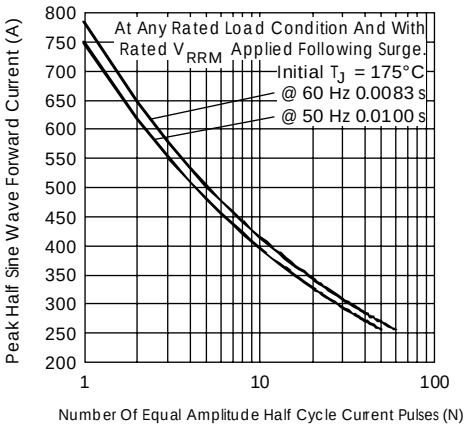


Fig. 5 - Maximum Non-Repetitive Surge Current

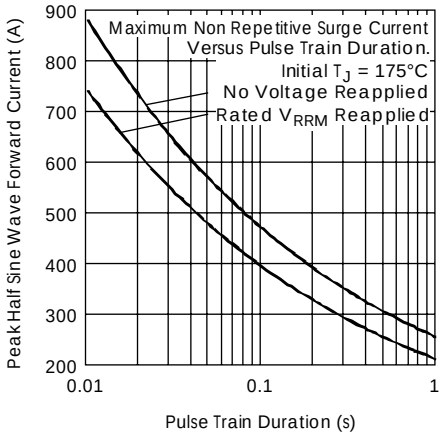


Fig. 6 - Maximum Non-Repetitive Surge Current

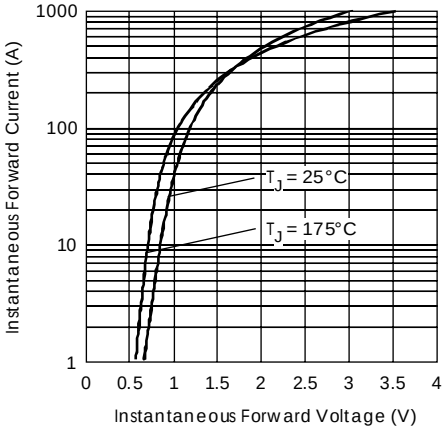


Fig. 7 - Forward Voltage Drop Characteristics

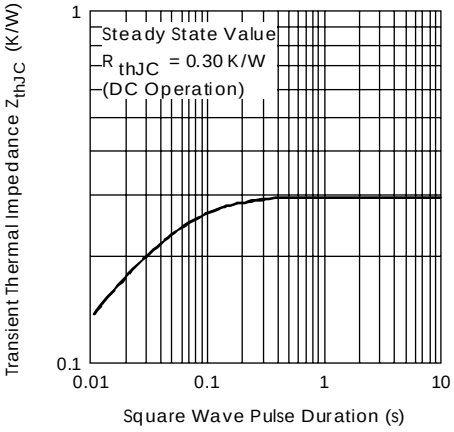


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

International IOR Rectifier

WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.
EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.
IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
IR SOUTHEAST ASIA: 1 Kim Seng Promenade, Great World City West Tower,13-11, Singapore 237994. Tel: ++ 65 838 4630.
IR TAIWAN: 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.

http://www.irf.com *Fax-On-Demand: +44 1883 733420*