DS2907SZ

Rectifier Diode

DS5737-1.0 February 2004

FEATURES

- Double Side Cooling
- High Surge Capability

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APPLICATIONS

- Rectification
- Freewheel Diode
- DC Motor Control
- Power Supplies

KEY PARAMETERS

V_{RRM} 5200V

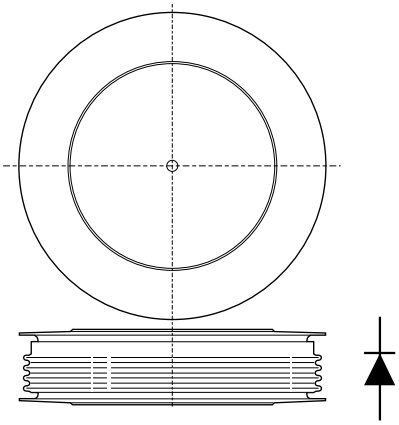
$I_{F(AV)}$ 4914A

I_{FSM} 70000A

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DS2907SZ52	5200	$V_{RSM} = V_{RRM} + 100V$
DS2907SZ50	5000	
DS2907SZ48	4800	
DS2907SZ46	4600	
DS2907SZ44	4400	

Lower voltage grades available



Outline type code: Z
See Package Details for further information.

Fig. 1 Package outline

ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table, e.g.:

DS2907SZ48

Note: Please use the complete part number when ordering and quote this number in any future correspondance relating to your order.

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CURRENT RATINGS

T_{case} = 75°C unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	4914	A
$I_{F(RMS)}$	RMS value	-	7715	A
I_F	Continuous (direct) forward current	-	7150	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	3213	A
$I_{F(RMS)}$	RMS value	-	5044	A
I_F	Continuous (direct) forward current	-	4407	A

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T_{case} = 100°C unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	3768	A
$I_{F(RMS)}$	RMS value	-	5916	A
I_F	Continuous (direct) forward current	-	5414	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	2433	A
$I_{F(RMS)}$	RMS value	-	3820	A
I_F	Continuous (direct) forward current	-	3256	A

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SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_{case} = 150°C	70	kA
I^2t	I^2t for fusing	V_R = 0	24.5 x 10^6	A^2s

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THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0065	°C/W
		Single side cooled	Anode dc	-	0.013	°C/W
			Cathode dc	-	0.013	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 83.0kN with mounting compound	Double side	-	0.001	°C/W
			Single side	-	0.002	°C/W
T_{vj}	Virtual junction temperature	Forward (conducting)		-	160	°C
		Reverse (blocking)		-	150	°C
T_{stg}	Storage temperature range			–55	150	°C
-	Clamping force			75.0	91.0	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 3000A peak, T_{case} = 25°C	-	1.17	V
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	200	mA
V_{TO}	Threshold voltage	At T_{vj} = 150˚C	-	0.82	V
r_T	Slope resistance	At T_{vj} = 150˚C	-	0.111	mΩ

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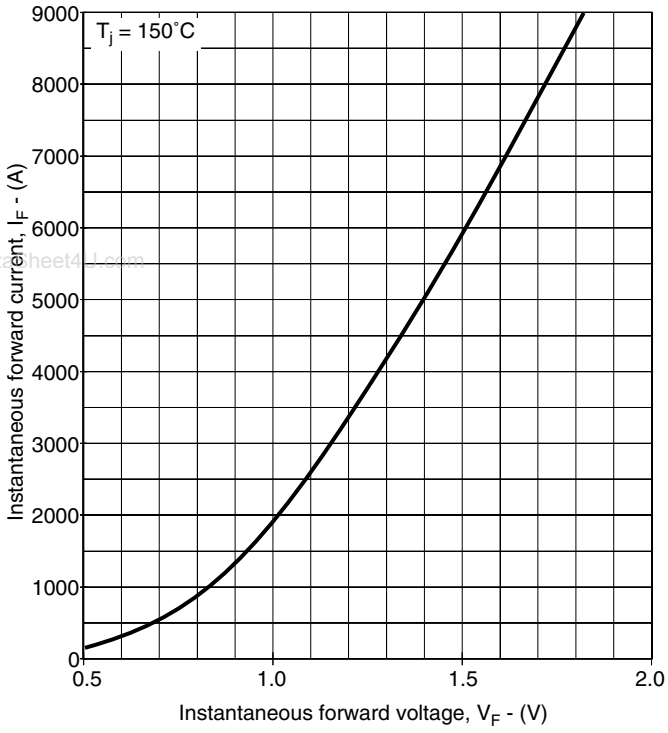
CURVES



V_{FM} Equation:-

$V_{FM} = A + B\ln(I_F) + C.I_F + D.\sqrt{I_F}$

Where A = –0.0436
B = 0.10422
C = 7.6×10^{-5}
D = 0.00243

these values are valid for T_j = 125˚C for I_F = 400A to 9000A

Fig. 2 Maximum (limit) forward characteristics

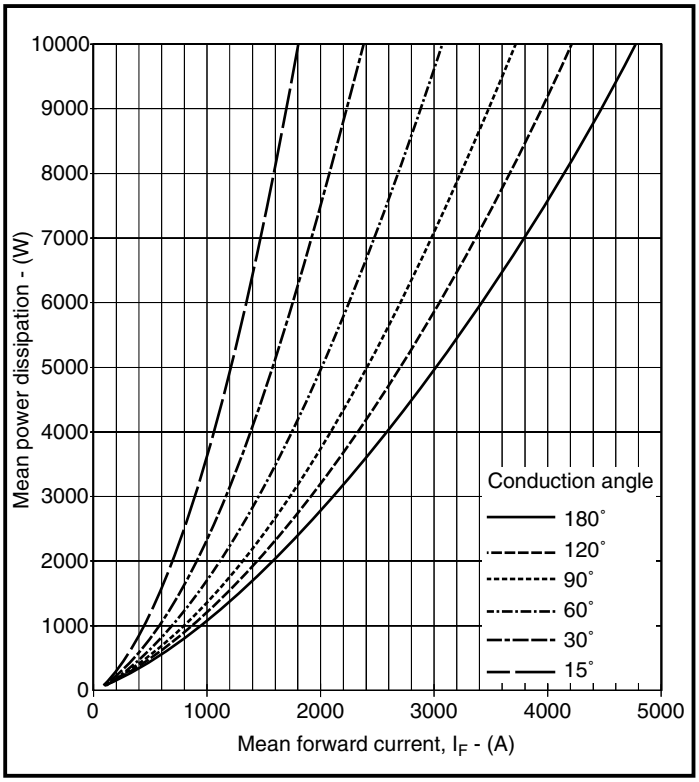


Fig. 3 Power loss curves - sine wave

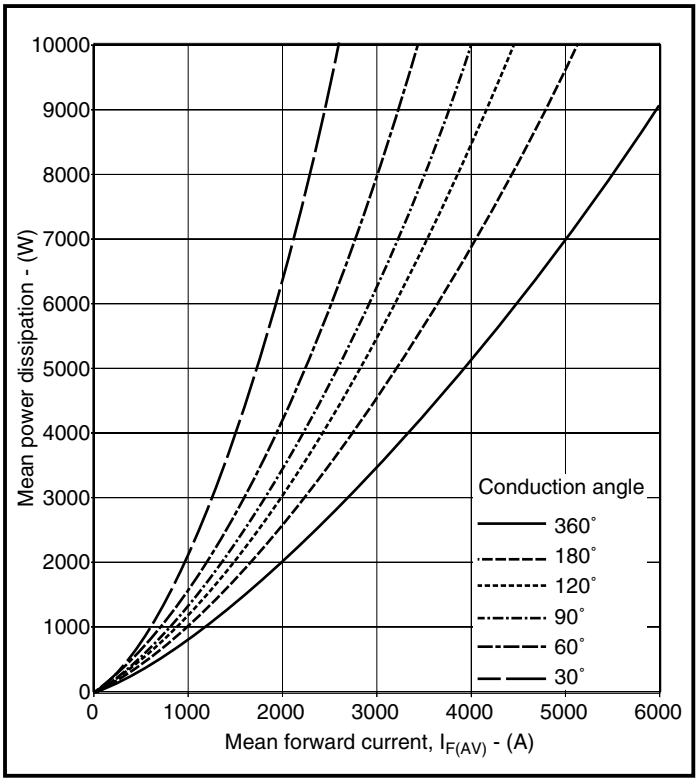


Fig. 4 Power loss curves - square wave

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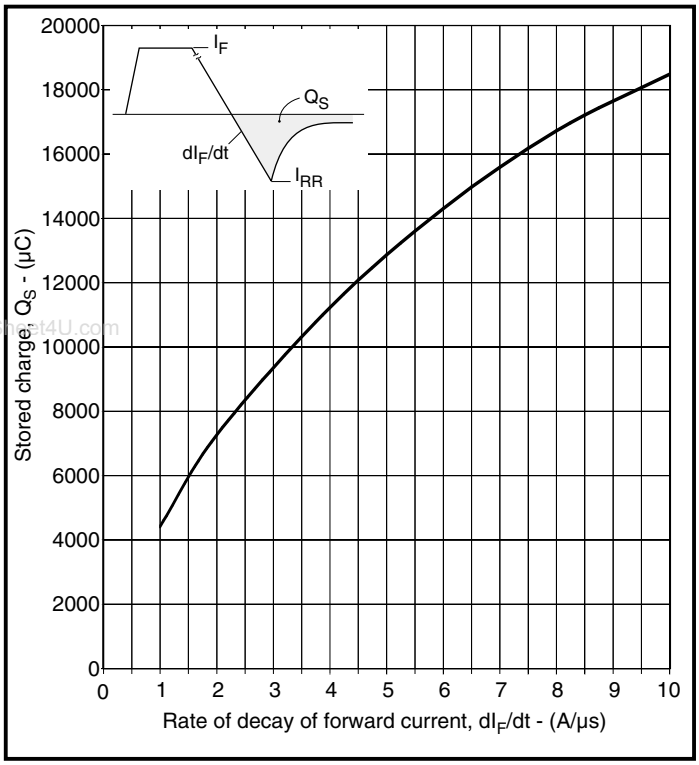

Fig. 5 Stored charge

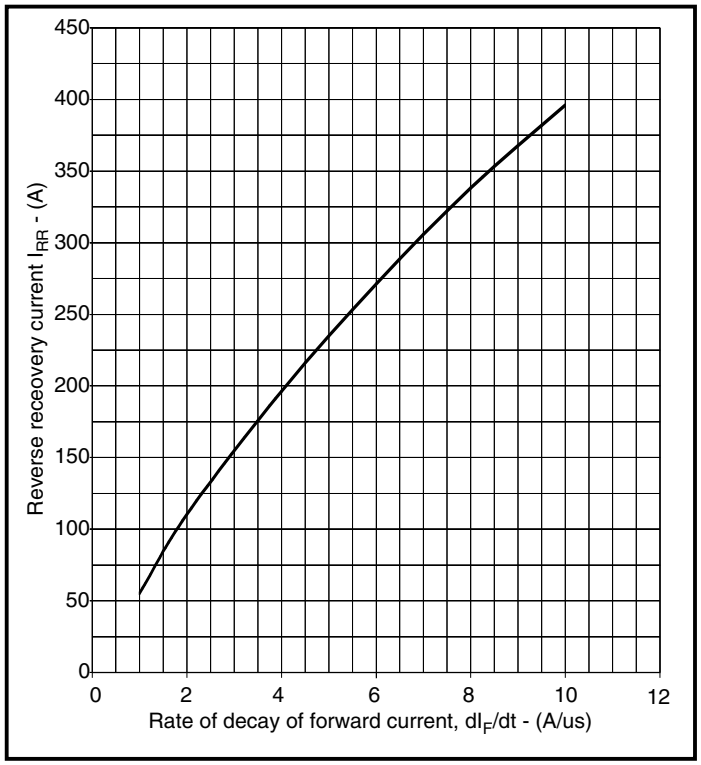

Fig. 6 Reverse recovery current

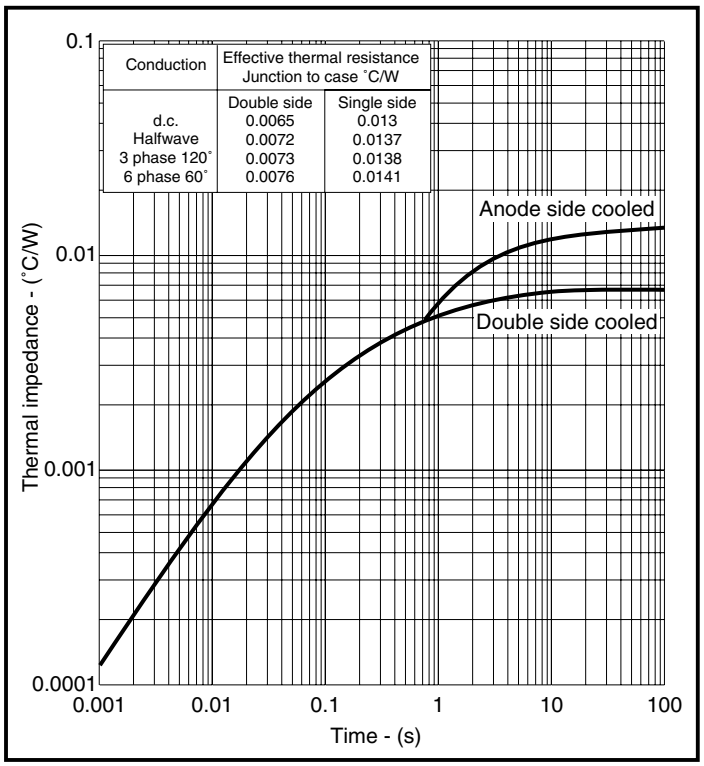

Fig. 7 Maximum (limit) transient thermal impedance - junction to case - (°C/W)

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PACKAGE DETAILS

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise.
DO NOT SCALE.

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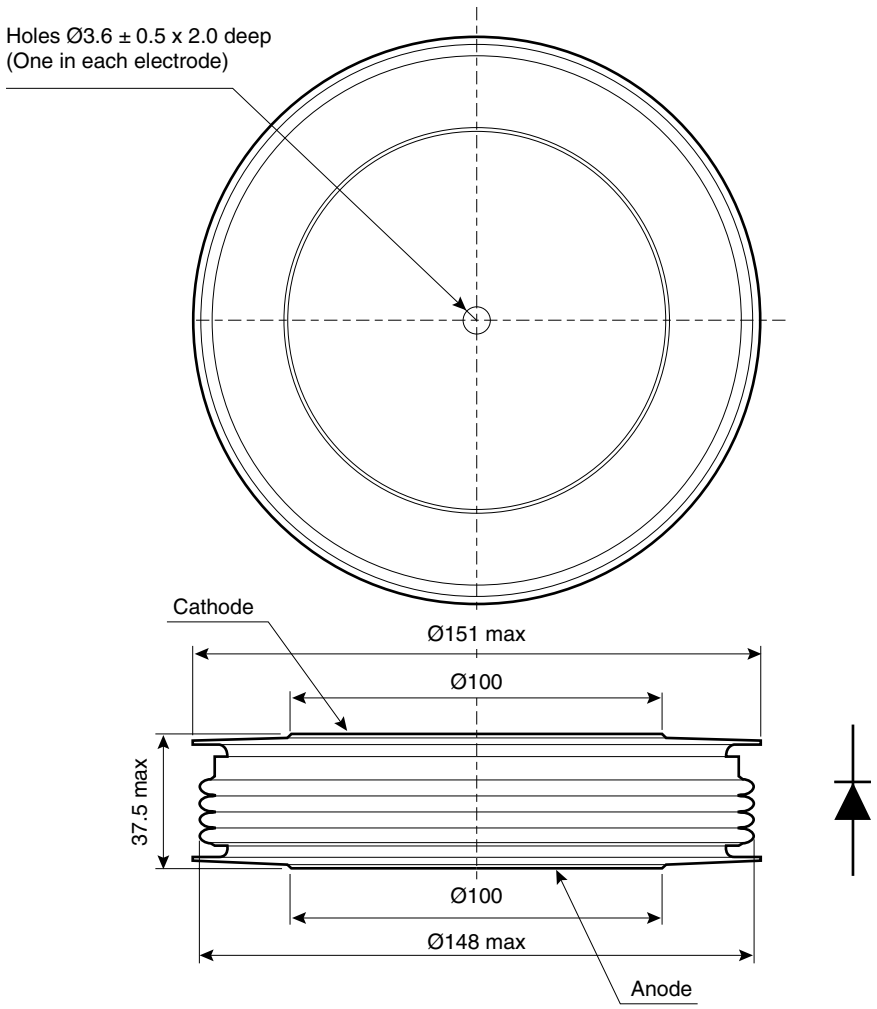

Nominal weight: 2800g
Clamping force: 83kN ±10%

Package outline type code: Z

Fig. 8 Package details

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POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group offers high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

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HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks which have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or Customer Services.

Stresses above those listed in this data sheet may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed.

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