

### FEATURES

- Double Side Cooling
- High Surge Capability

### APPLICATIONS

- Rectification
- Freewheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
DS1112SG60	6000	$V_{RSM} = V_{RRM} + 100V$
DS1112SG59	5900	
DS1112SG58	5800	
DS1112SG57	5700	
DS1112SG56	5600	
DS1112SG55	5500	

Lower voltage grades available.

### KEY PARAMETERS

$V_{RRM}$  6000V

$I_{F(AV)}$  811A

$I_{FSM}$  10500A

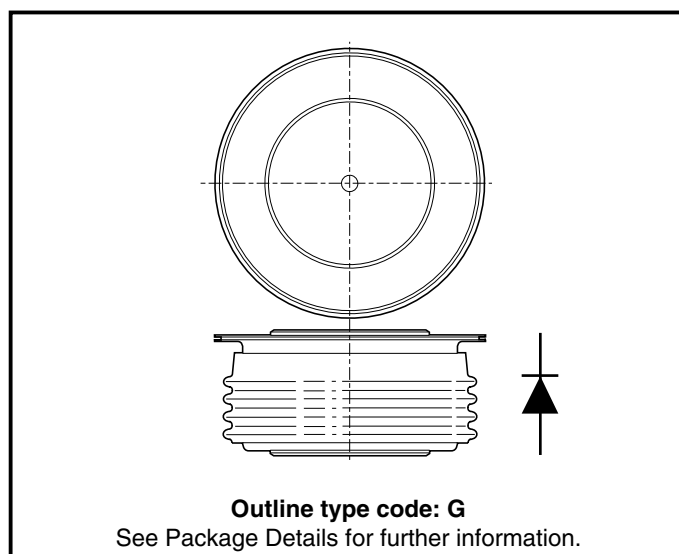


Fig. 1 Package outline

### ORDERING INFORMATION

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

#### DS1112SG58

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

## CURRENT RATINGS

$T_{case} = 75^{\circ}\text{C}$  unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	811	A
$I_{F(RMS)}$	RMS value	-	1274	A
$I_F$	Continuous (direct) forward current	-	1172	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	534	A
$I_{F(RMS)}$	RMS value	-	839	A
$I_F$	Continuous (direct) forward current	-	727	A

$T_{case} = 100^{\circ}\text{C}$  unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 100^{\circ}\text{C}$	630	A
$I_{F(RMS)}$	RMS value	$T_{case} = 100^{\circ}\text{C}$	990	A
$I_F$	Continuous (direct) forward current	$T_{case} = 100^{\circ}\text{C}$	900	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 100^{\circ}\text{C}$	410	A
$I_{F(RMS)}$	RMS value	$T_{case} = 100^{\circ}\text{C}$	644	A
$I_F$	Continuous (direct) forward current	$T_{case} = 100^{\circ}\text{C}$	550	A

## SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 150^{\circ}C$ $V_R = 50\% V_{RRM} - 1/4$ sine	8.5	kA
$I^2t$	$I^2t$ for fusing		$360 \times 10^3$	$A^2s$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 150^{\circ}C$ $V_R = 0$	10.5	kA
$I^2t$	$I^2t$ for fusing		$565 \times 10^3$	$A^2s$

## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.032	$^{\circ}C/W$
		Single side cooled	Anode dc	-	0.064	$^{\circ}C/W$
			Cathode dc	-	0.064	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 12.0kN with mounting compound	Double side	-	0.008	$^{\circ}C/W$
			Single side	-	0.016	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	160	$^{\circ}C$
		Reverse (blocking)		-	150	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	175	$^{\circ}C$
-	Clamping force			11.5	13.5	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
$V_{FM}$	Forward voltage	At 1800A peak, $T_{case} = 25^{\circ}C$	-	2.1	V
$I_{RM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 150^{\circ}C$	-	75	mA
$Q_S$	Total stored charge	$I_F = 1000A$ , $di_{RR}/dt = 3A/\mu s$ $T_{case} = 150^{\circ}C$ , $V_R = 100V$	-	3000	$\mu C$
$I_{rr}$	Reverse recovery current		-	90	A
$V_{TO}$	Threshold voltage	At $T_{vj} = 150^{\circ}C$	-	0.9	V
$r_T$	Slope resistance	At $T_{vj} = 150^{\circ}C$	-	0.93	m $\Omega$

CURVES

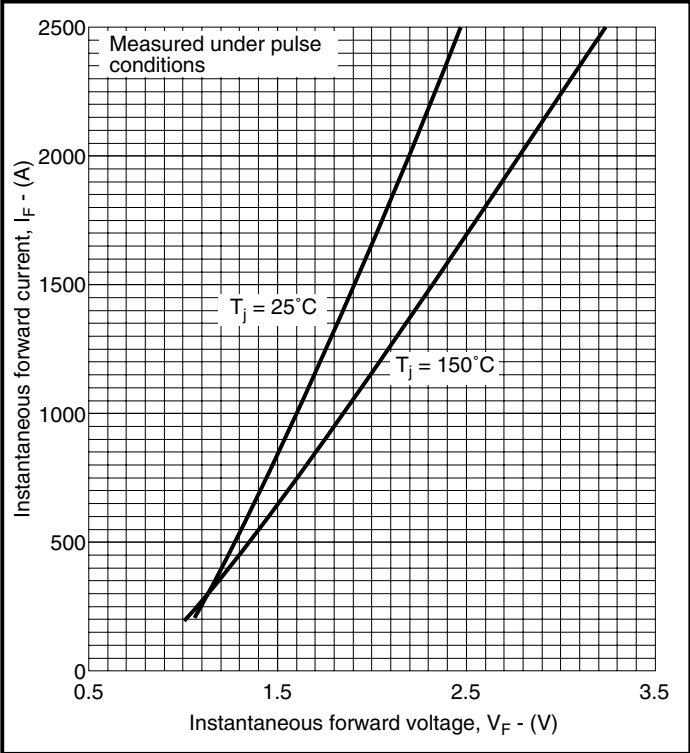


Fig.2 Maximum (limit) forward characteristics

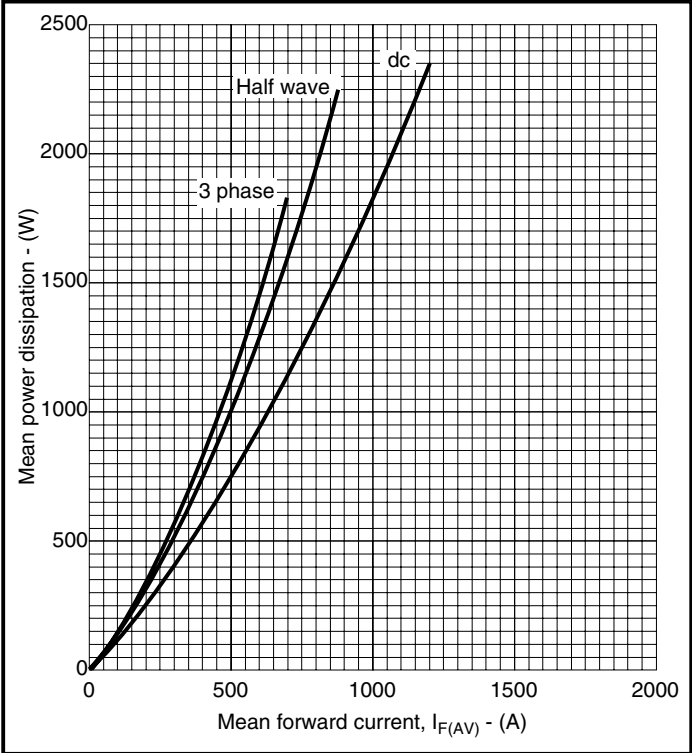


Fig.3 Dissipation curves

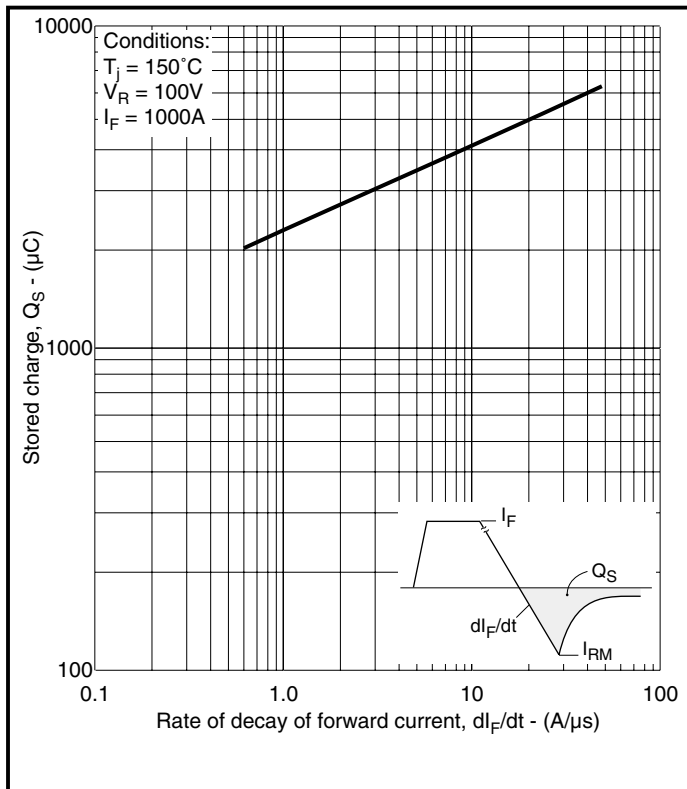
$V_{FM}$  Equation:-

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

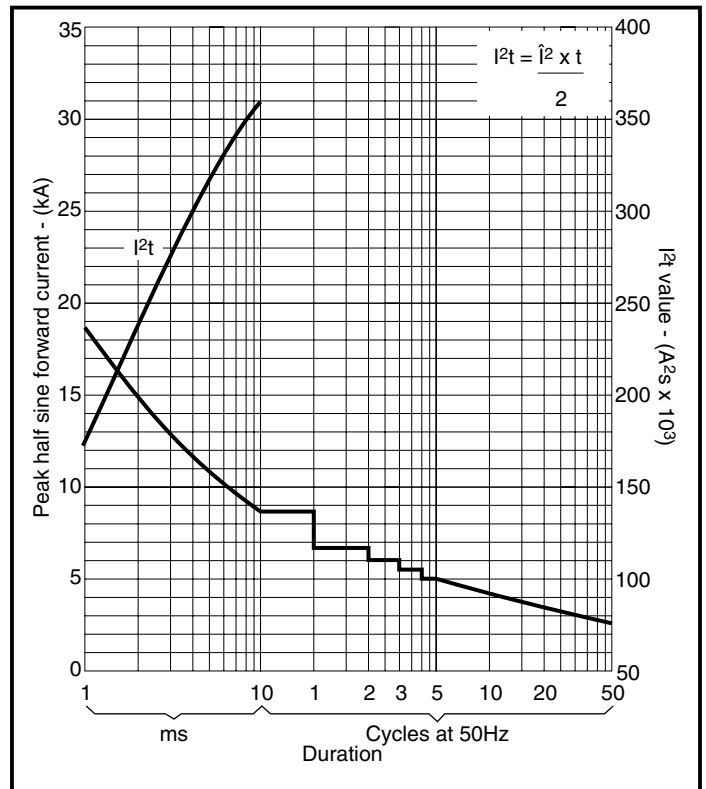
Where

- A = 1.249986
- B = -0.17646
- C = 0.000524
- D = 0.041024

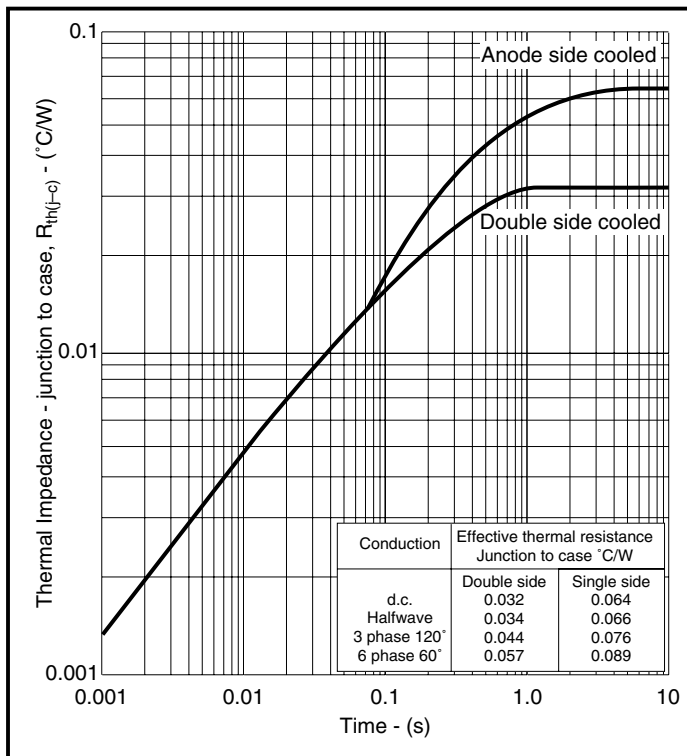
these values are valid for  $T_j = 125^{\circ}C$  for  $I_F$  500A to 2500A



**Fig.4 Total stored charge**



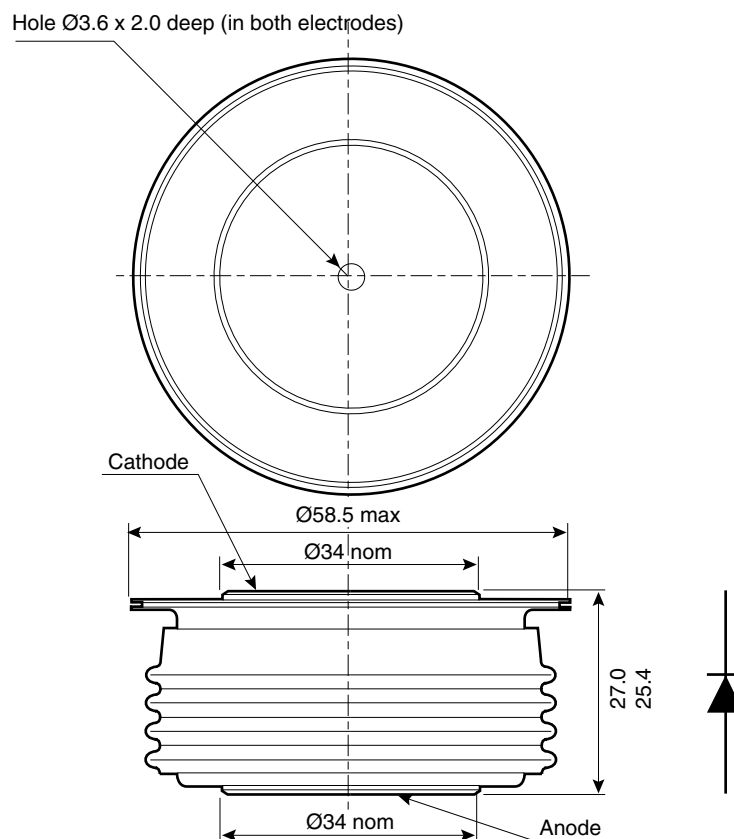
**Fig.5 Surge (non-repetitive) forward current vs time (with 50%  $V_{RRM}$  at  $T_{case} 125^\circ\text{C}$ )**



**Fig.6 Maximum (limit) transient thermal impedance - junction to case**

## PACKAGE DETAILS

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



Nominal weight: 250g  
Clamping force: 12kN  $\pm 10\%$

**Package outline type code: G**

### Note:

1. Package maybe supplied with pins and/or tags.

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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).

## 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.



<http://www.dynexsemi.com>

**e-mail: [power\\_solutions@dynexsemi.com](mailto:power_solutions@dynexsemi.com)**

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**HEADQUARTERS OPERATIONS**  
**DYNEX SEMICONDUCTOR LTD**  
Doddington Road, Lincoln.  
Lincolnshire. LN6 3LF. United Kingdom.  
Tel: +44-(0)1522-500500  
Fax: +44-(0)1522-500550

**CUSTOMER SERVICE**  
Tel: +44 (0)1522 502753 / 502901. Fax: +44 (0)1522 500020

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