

# DSF11060SG

## FAST RECOVERY DIODE

### APPLICATIONS

- Snubber Diode For GTO Circuits.

### KEY PARAMETERS

$V_{RRM}$	6000V
$I_{F(AV)}$	400A
$I_{FSM}$	4200A
$Q_r$	700 $\mu$ C
$t_{rr}$	6.0 $\mu$ s

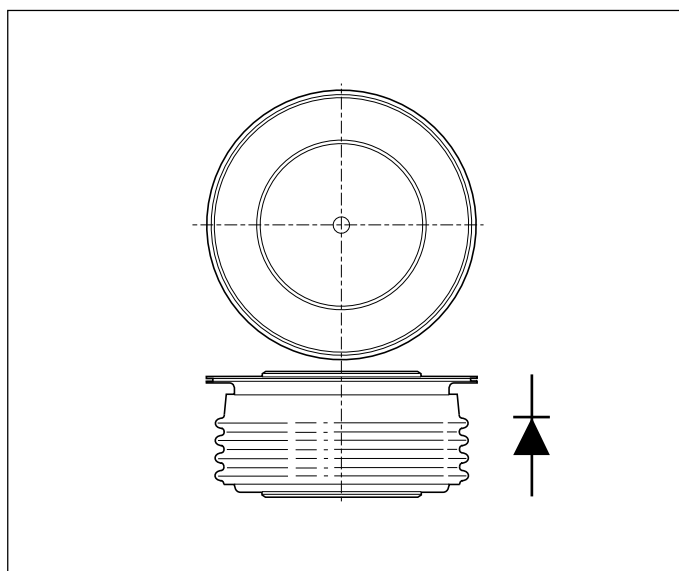
### FEATURES

- Double Side Cooling.
- High Surge Capability.
- Low Recovery Charge.

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
DSF11060SG60 DSF11060SG58 DSF11060SG56 DSF11060SG55	6000 5800 5600 5500	$V_{RSM} = V_{RRM} + 100V$

Lower voltage grades available.



Outline type code: M779b.  
See package outlines for further information.

### CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	400	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	631	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	585	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	265	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	420	A
$I_F$	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	365	A

DSF11060SG

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 0% $V_{RRM}$ , $T_j = 150^{\circ}C$	4.2	kA
$I^2t$	$I^2t$ for fusing		$88 \times 10^3$	$A^2s$
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; with 50% $V_{RRM}$ , $T_j = 150^{\circ}C$	3.4	kA
$I^2t$	$I^2t$ for fusing		$57.8 \times 10^3$	$A^2s$

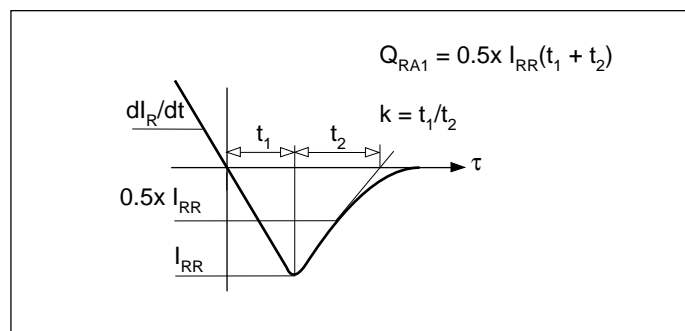
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
R <sub>th(j-c)</sub>	Thermal resistance - junction to case	Double side cooled	dc	-	0.032	°C/W
		Single side cooled	Anode dc	-	0.064	°C/W
			Cathode dc	-	0.064	°C/W
R <sub>th(c-h)</sub>	Thermal resistance - case to heatsink	Clamping force 12kN with mounting compound	Double side	-	0.008	°C/W
			Single side	-	0.016	°C/W
T <sub>vj</sub>	Virtual junction temperature	Forward (conducting)		-	135	°C
T <sub>stg</sub>	Storage temperature range			-55	125	°C
-	Clamping force			10.8	13.2	kN

## CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
$V_{FM}$	Forward voltage	At 600A peak, $T_{case} = 25^{\circ}C$	-	3.8	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 125^{\circ}C$	-	70	mA
$t_{rr}$	Reverse recovery time	$I_F = 1000A$ , $di_{RR}/dt = 100A/\mu s$ $T_{case} = 125^{\circ}C$ , $V_R = 100V$	6.0	-	$\mu s$
$Q_{RA1}$	Recovered charge (50% chord)		-	1000	$\mu C$
$I_{RM}$	Reverse recovery current		350	-	A
K	Soft factor		1.7	-	-
$V_{TO}$	Threshold voltage	At $T_{vj} = 125^{\circ}C$	-	1.5	V
$r_T$	Slope resistance	At $T_{vj} = 125^{\circ}C$	-	2.9	$m\Omega$
$V_{FRM}$	Forward recovery voltage	$di/dt = 1000A/\mu s$ , $T_j = 100^{\circ}C$	-	400	V

## DEFINITION OF K FACTOR AND $Q_{RA1}$



CURVES

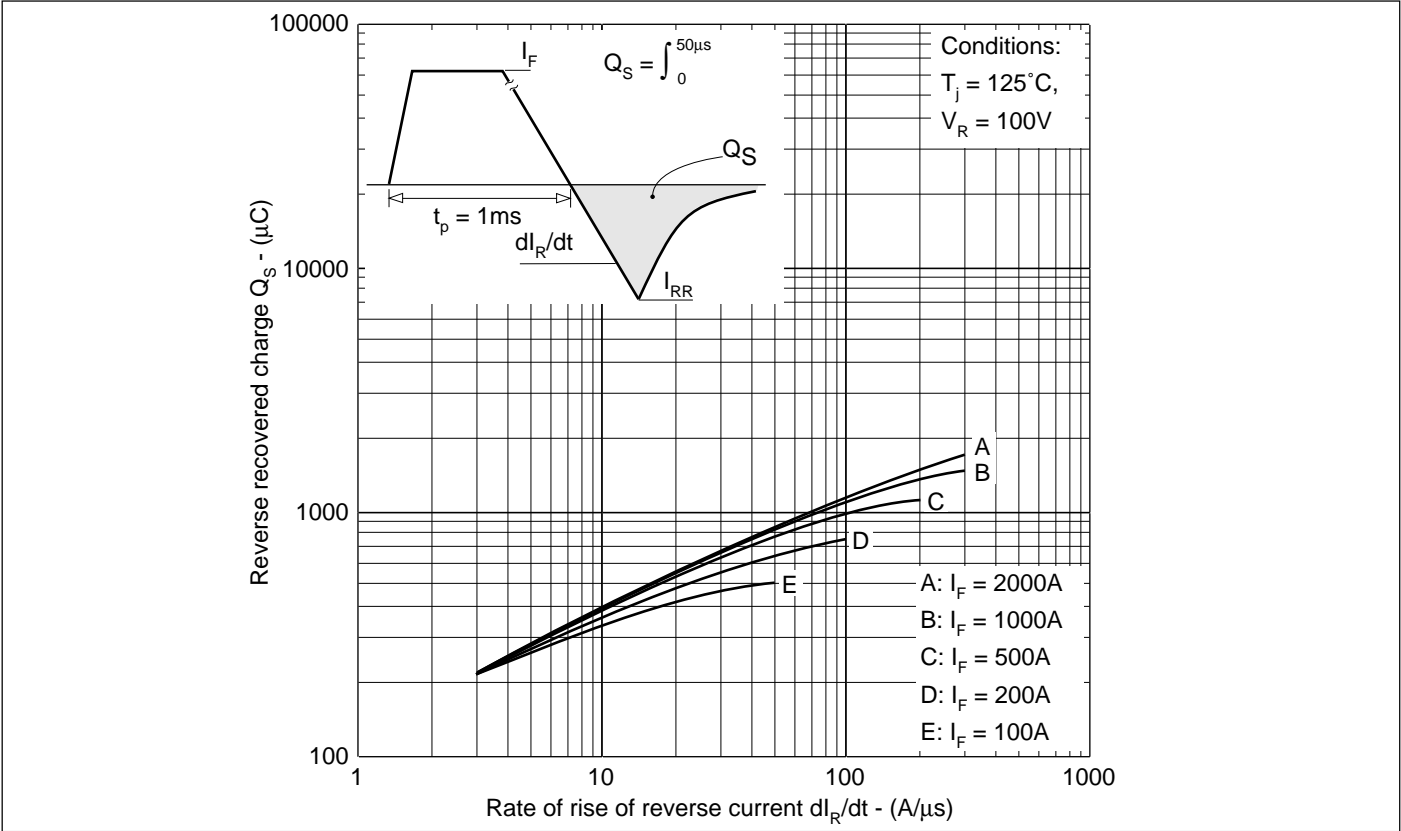


Fig. 1 Recovered charge

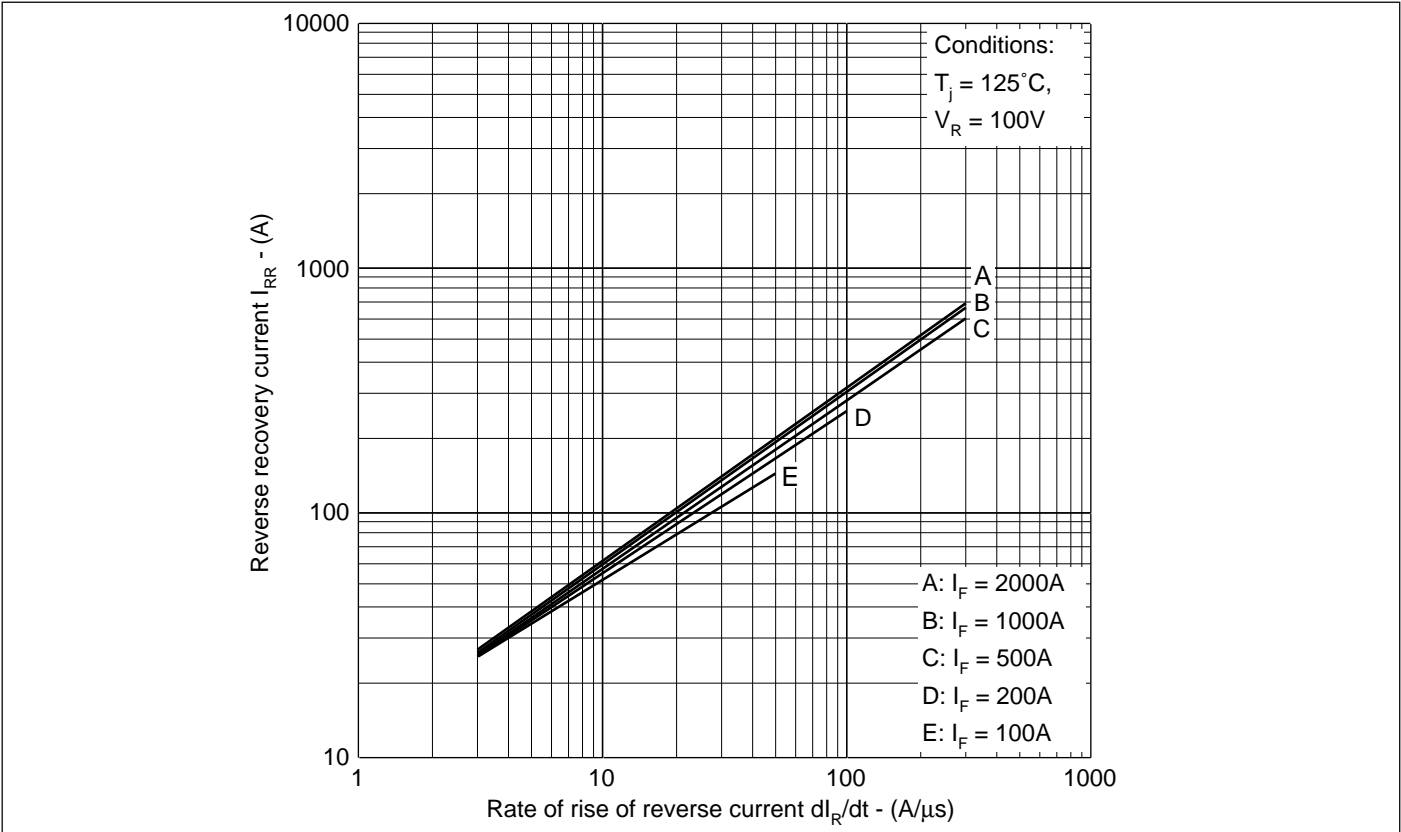


Fig. 5 typical reverse recovery current vs rate of rise of reverse current

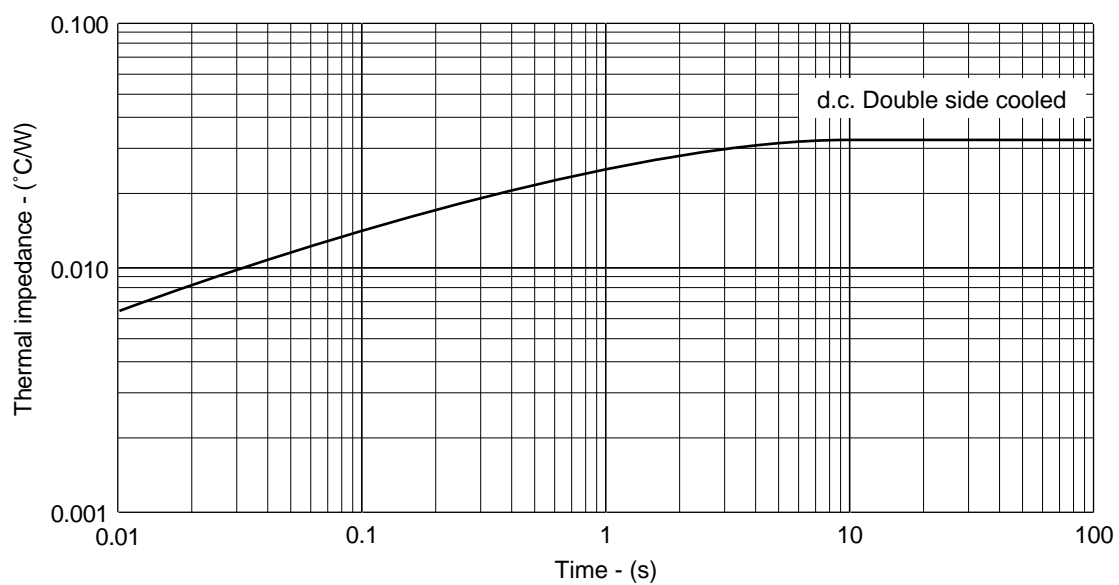


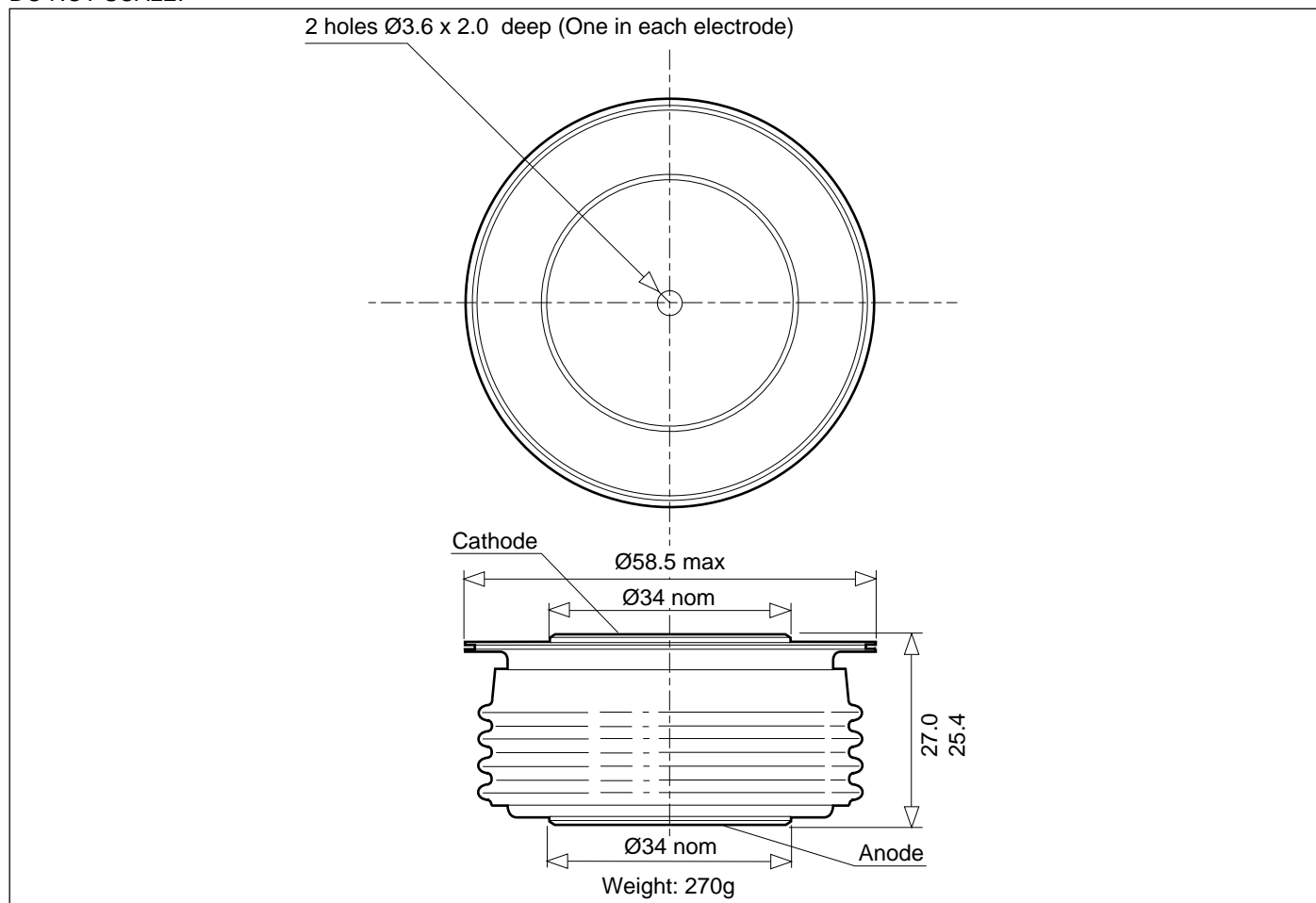
Fig. 3 Maximum (limit) transient thermal impedance - junction to case - ( $^{\circ}\text{C/W}$ )

## DSF11060SG

### PACKAGE DETAILS - M779b

(Alternative outline G includes gate connections, all other details are the same as M779b).

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



#### HEADQUARTERS OPERATIONS

##### GEC PLESSEY SEMICONDUCTORS

Cheney Manor, Swindon,  
Wiltshire, SN2 2QW, United Kingdom.

Tel: + 44 (0)1793 518000

Fax: + 44 (0)1793 518411

##### GEC PLESSEY SEMICONDUCTORS

P.O. Box 660017

1500 Green Hills Road,  
Scotts Valley, California 95067-0017,  
United States of America.

Tel: + 1 (408) 438 2900

Fax: + 1 (408) 438 5576

#### POWER PRODUCT CUSTOMER SERVICE CENTRES

- **FRANCE.** 2 rue Henri-Bergson, 92665 Asnieres Cedex.  
Tel: + 33 1 40 80 54 00. Fax: + 33 1 40 80 55 87.
- **GERMANY.** Ungererstrasse 129, 80505 München.  
Tel: + 49 (0)89 36 09 060. Fax: + 49 (0)89 36 09 06 55.
- **NORTH AMERICA.** At Dedham Place, Suite 125, 3 Allied Drive, Dedham. MA 02026.  
Tel: + 1 617 251 0126. Fax: + 1 617 251 0106.
- **UNITED KINGDOM.** Doddington Road, Lincoln. LN6 3LF.  
Tel: + 44 (0)1522 500500. Fax: + 44 (0)1522 500550.

These are supported by Agents and Distributors in major countries world-wide.

© GEC Plessey Semiconductors 1996 Publication No. DS4217-2 Issue 2.3 September 1996

TECHNICAL DOCUMENTATION - NOT FOR RESALE. PRINTED IN UNITED KINGDOM.

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior notice the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.