

APPLICATIONS

■ The DSF21545SV is a purpose designed freewheel diode to complement the DG858BW GTO in inverter circuits, using energy recovery snubbers.

FEATURES

- The DSF21545SV is designed for fast turn-on thus minimising reverse current through the GTO.
- Low recovered charge for low losses.
- DSF21545SV is housed in a similar outline to that of the DG858BW therefore offering complete mechanical compatibility for parallel and series clamping.

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DSF21545SV45	4500	$V_{RSM} = V_{RRM} + 100V$

Lower voltage grades available.

ORDERING INFORMATION

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

DSF21545SV45

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

KEY PARAMETERS

V_{RRM}	4500V
$I_{F(AV)}$	3230A
I_{FSM}	20000A
Q_r	1800 μ C
t_{tr}	7.0 μ s

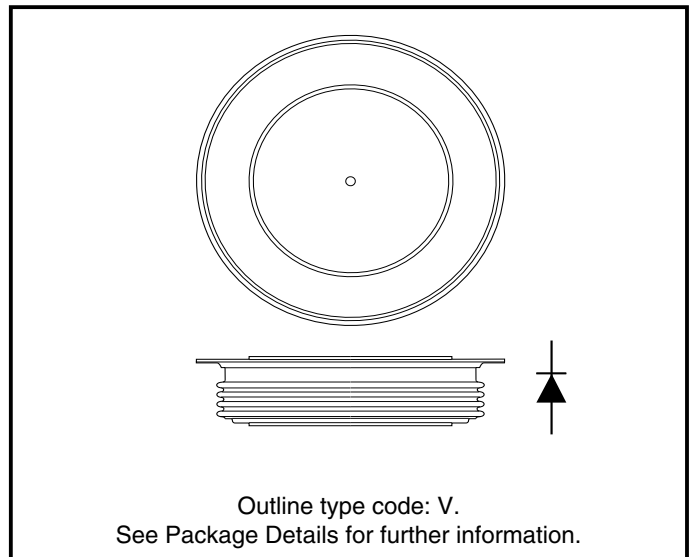


Fig. 1 Package outline

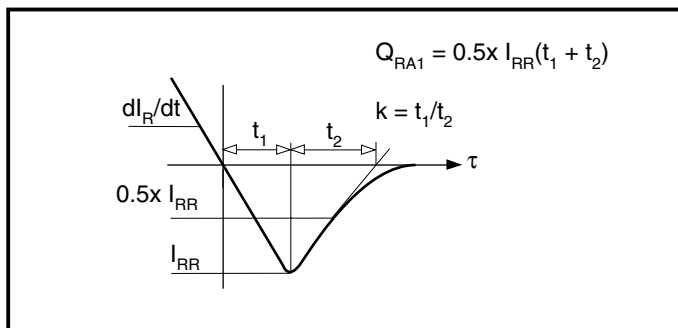
CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	3230	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	5080	A
I_F	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	4680	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^{\circ}C$	2070	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^{\circ}C$	3255	A
I_F	Continuous (direct) forward current	$T_{case} = 65^{\circ}C$	2875	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 0% V_{RRM} , $T_j = 150^{\circ}C$	20	kA
I^2t	I^2t for fusing		2.0×10^6	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 50% V_{RRM} , $T_j = 150^{\circ}C$	16	kA
I^2t	I^2t for fusing		1.28×10^6	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 100% V_{RRM} , $T_j = 150^{\circ}C$	-	kA
I^2t	I^2t for fusing		-	A^2s

DEFINITION OF K FACTOR AND Q_{RA1}



THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0075	°C/W
		Single side cooled	Anode dc	-	0.015	°C/W
			Cathode dc	-	0.015	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 35.0kN with mounting compound		-	0.002	°C/W
				-	0.004	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	150	°C
T_{stg}	Storage temperature range			-55	150	°C
-	Clamping force			34	48	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 3000A peak, $T_{case} = 25^{\circ}C$	-	2.0	V
I_{RRM}	Peak reverse current	At V_{RRM} , $T_{case} = 150^{\circ}C$	-	150	mA
t_{rr}	Reverse recovery time	$I_F = 1000A$, $di_{RR}/dt = 100A/\mu s$ $T_{case} = 150^{\circ}C$, $V_R = 100V$	7.0	-	μs
Q_{RA1}	Recovered charge (50% chord)		-	1800	μC
I_{RM}	Reverse recovery current		-	500	A
K	Soft factor		2	-	-
V_{TO}	Threshold voltage	At $T_{vj} = 150^{\circ}C$	-	1.25	V
r_T	Slope resistance	At $T_{vj} = 150^{\circ}C$	-	0.25	m Ω
V_{FRM}	Forward recovery voltage	$di/dt = 1000A/\mu s$, $T_j = 125^{\circ}C$	-	75	V

CURVES

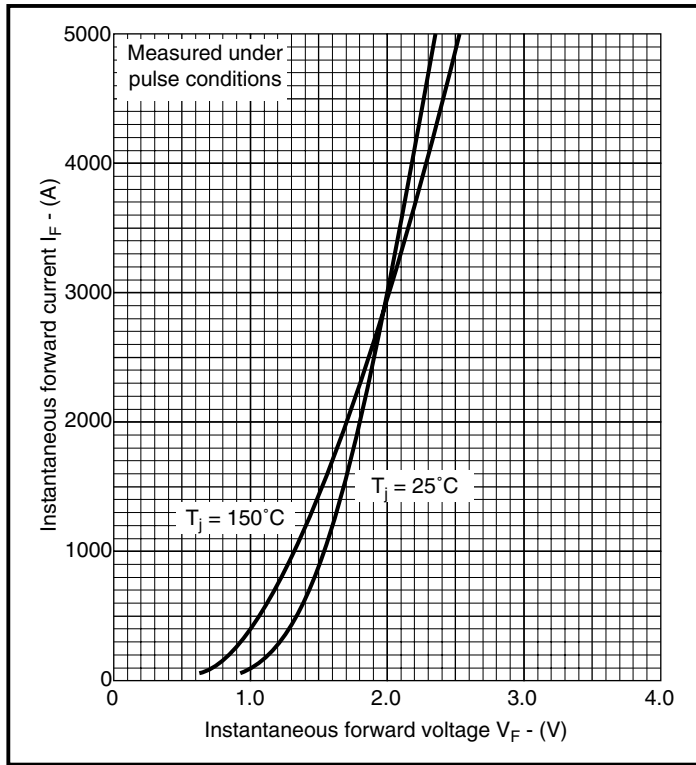


Fig.2 Maximum (limit) forward characteristics

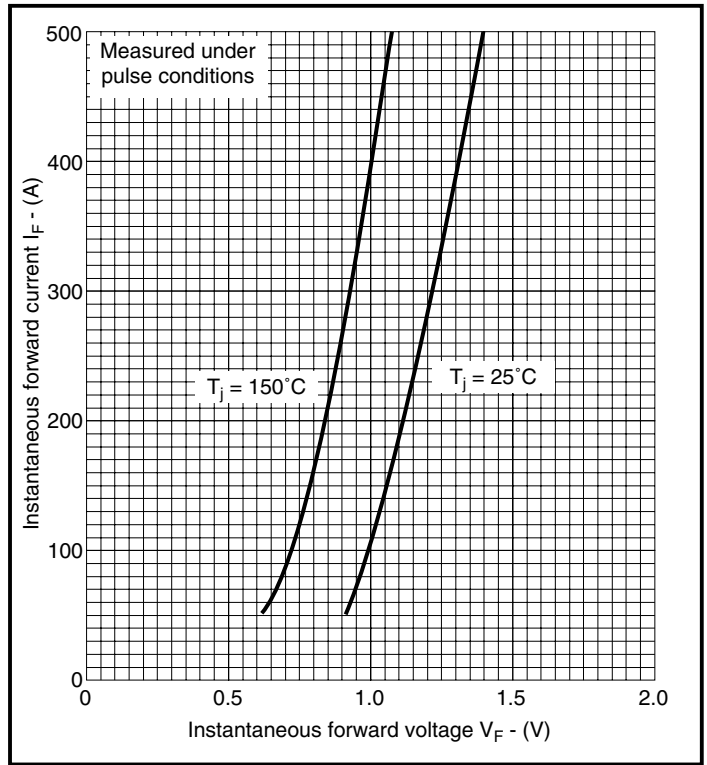


Fig.3 Maximum (limit) forward characteristics

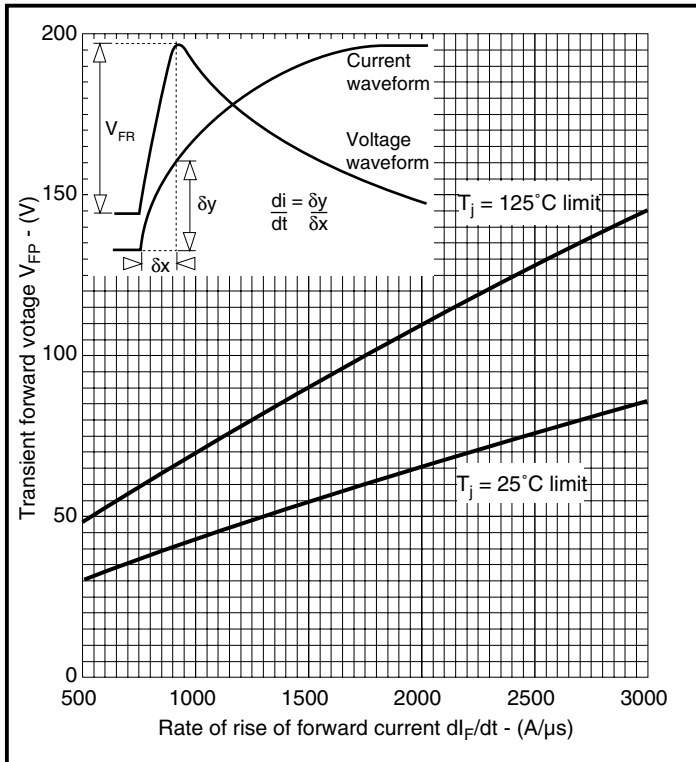


Fig.4 Transient forward voltage vs rate of rise of forward current

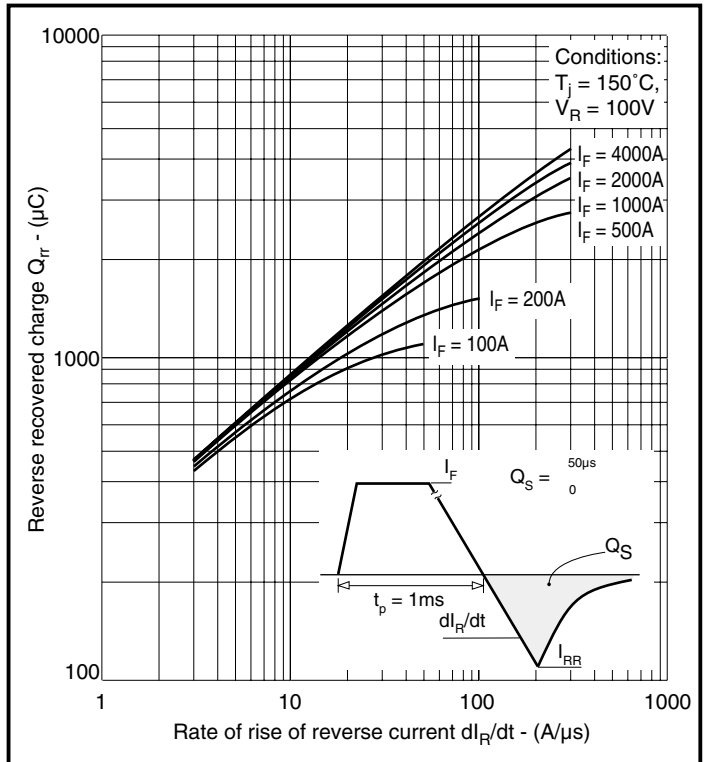


Fig.5 Recovered charge

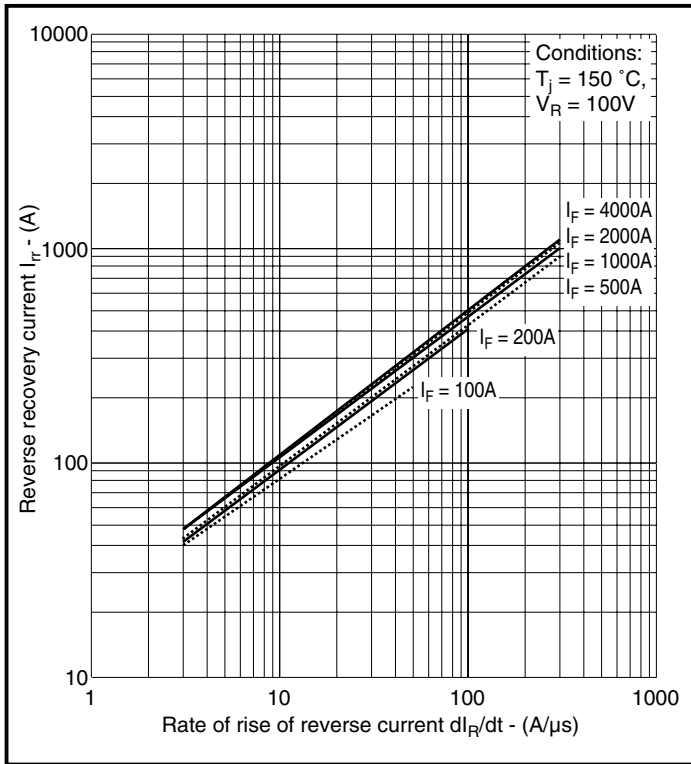


Fig.6 Typical reverse recovery current vs rate of rise of forward current

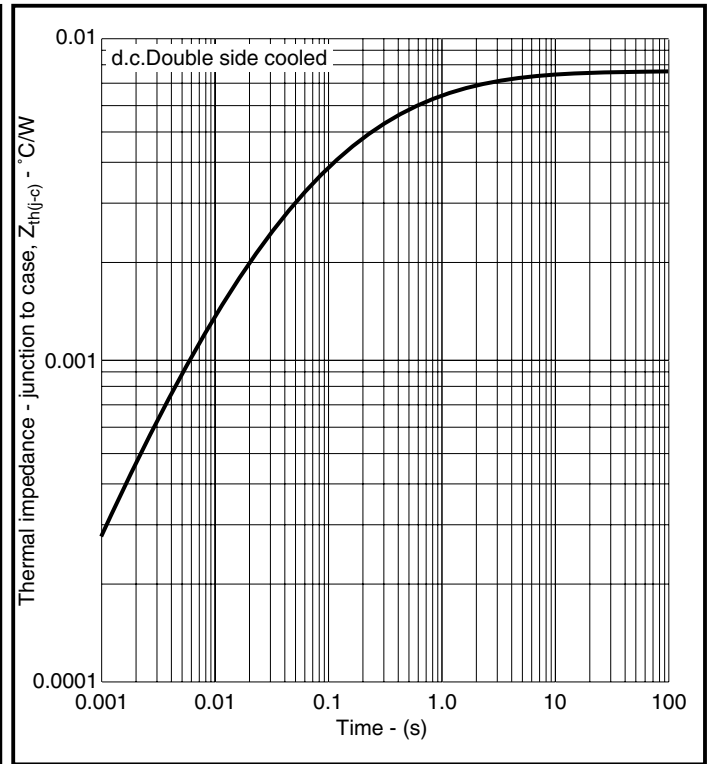
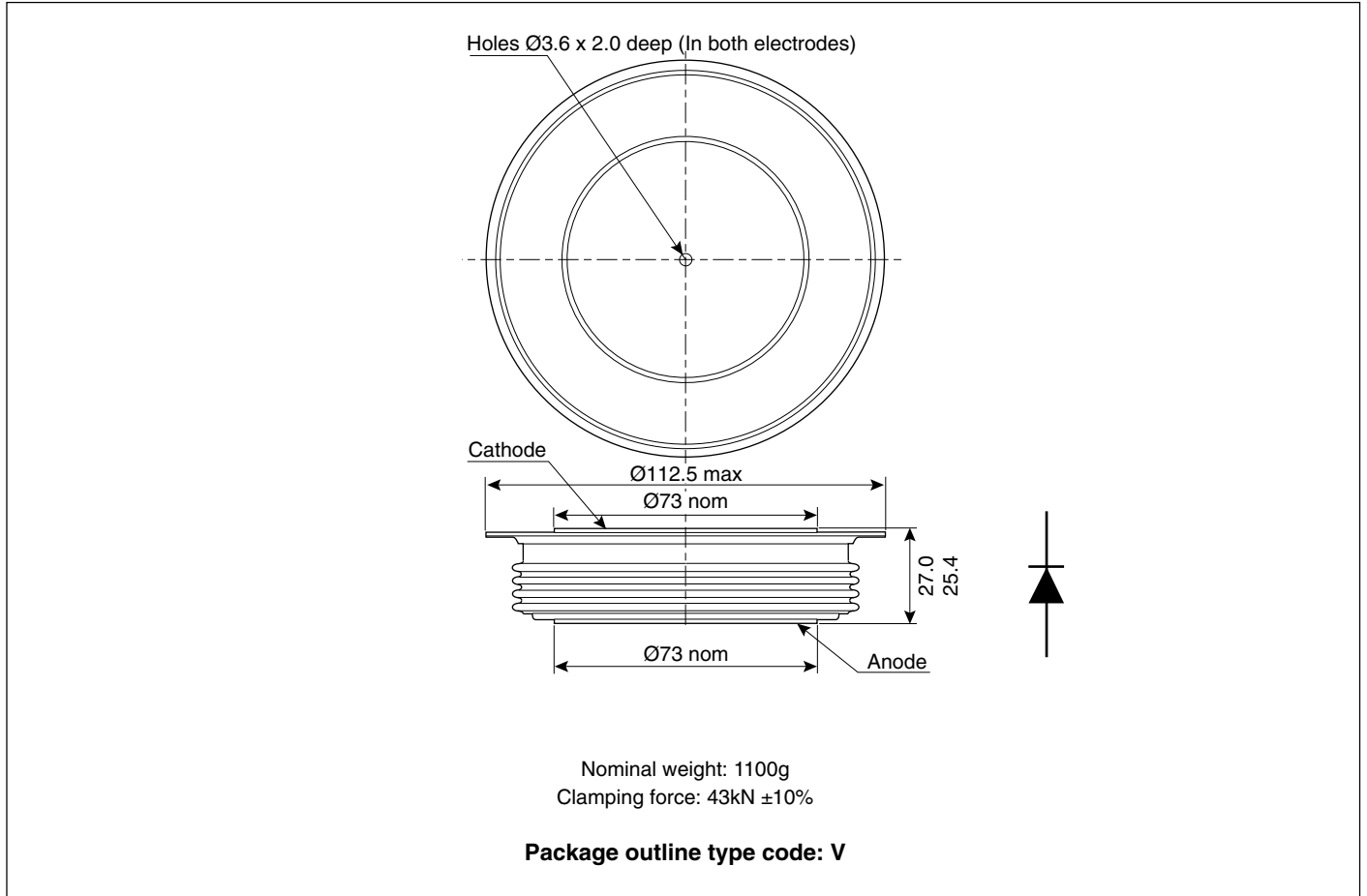


Fig.7 Maximum (limit) transient thermal impedance - junction to case - ($^\circ\text{C/W}$)

PACKAGE DETAILS

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



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.



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