

DS4152-Í ÁJ | 20FI ÁLN31790

APPLICATIONS

- Induction Heating
- A.C. Motor Drives
- Inverters And Choppers
- Welding
- High Frequency Rectification
- UPS

KEY PARAMETERS

V_{RRM}	4500V
$I_{F(AV)}$	1256A
I_{FSM}	16000A
Q_r	1250 μ C
t_{rr}	7.0 μ s

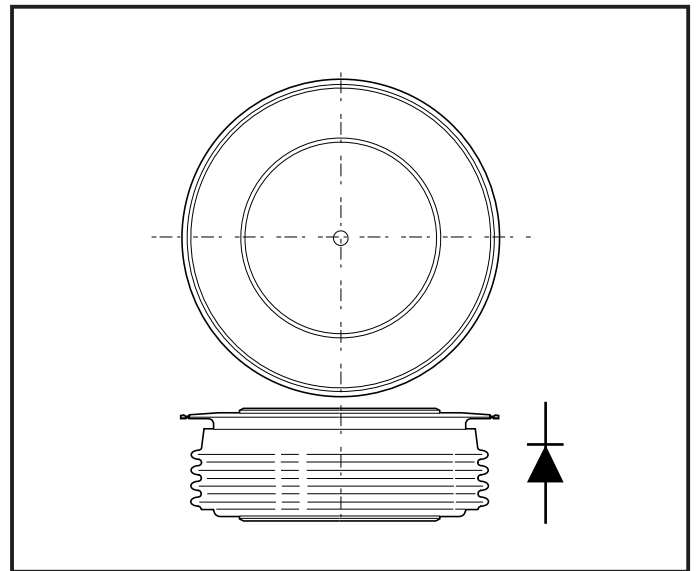
FEATURES

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

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DSF20545SF45	4500	$V_{RSM} = V_{RRM} + 100V$
DSF20545SF44	4400	
DSF20545SF43	4300	
DSF20545SF42	4200	
DSF20545SF41	4100	
DSF20545SF40	4000	

Lower voltage grades available.



Outline type code: CB450.
See Package Details for further information.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^\circ C$	1256	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^\circ C$	1971	A
I_F	Continuous (direct) forward current	$T_{case} = 65^\circ C$	1765	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{case} = 65^\circ C$	995	A
$I_{F(RMS)}$	RMS value	$T_{case} = 65^\circ C$	1552	A
I_F	Continuous (direct) forward current	$T_{case} = 65^\circ C$	1335	A

DSF20545SF

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 0% V_{RRM} , $T_j = 150^\circ\text{C}$	16	kA
I^2t	I^2t for fusing		1280×10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 50% V_{RRM} , $T_j = 150^\circ\text{C}$	12.8	kA
I^2t	I^2t for fusing		819.2×10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 100% V_{RRM} , $T_j = 150^\circ\text{C}$	-	kA
I^2t	I^2t for fusing		-	A^2s

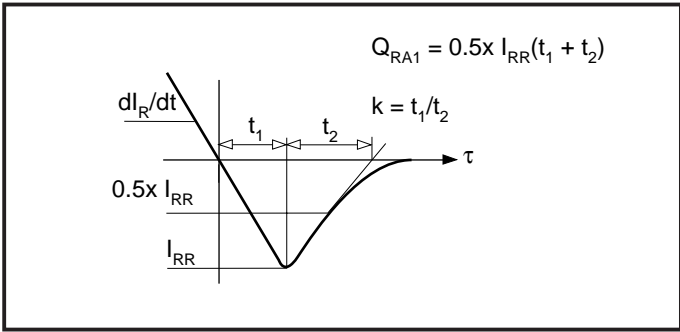
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.022	$^\circ\text{C}/\text{W}$
		Single side cooled	Anode dc	-	0.032	$^\circ\text{C}/\text{W}$
			Cathode dc	-	0.032	$^\circ\text{C}/\text{W}$
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 15kN with mounting compound	Double side	-	0.004	$^\circ\text{C}/\text{W}$
			Single side	-	0.008	$^\circ\text{C}/\text{W}$
T_{vj}	Virtual junction temperature	On-state (conducting)	-	150	$^\circ\text{C}$	
T_{stg}	Storage temperature range		-55	150	$^\circ\text{C}$	
-	Clamping force		17.5	21.5	kN	

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 1800A peak, $T_{case} = 25^\circ\text{C}$	-	2.1	V
I_{RRM}	Peak reverse current	At V_{RRM} , $T_{case} = 150^\circ\text{C}$	-	50	mA
t_{rr}	Reverse recovery time	$I_F = 1000\text{A}$, $di_{RR}/dt = 100\text{A}/\mu\text{s}$ $T_{case} = 150^\circ\text{C}$, $V_R = 100\text{V}$	-	7.0	μs
Q_{RA1}	Recovered charge (50% chord)		-	1250	μC
I_{RM}	Reverse recovery current		-	400	A
K	Soft factor		1.8	-	-
V_{TO}	Threshold voltage	At $T_{vj} = 150^\circ\text{C}$	-	1.36	V
r_T	Slope resistance	At $T_{vj} = 150^\circ\text{C}$	-	0.47	$\text{m}\Omega$
V_{FRM}	Forward recovery voltage	$di/dt = 1000\text{A}/\mu\text{s}$, $T_j = 125^\circ\text{C}$	-	160	V

DEFINITION OF K FACTOR AND Q_{RA1}



CURVES

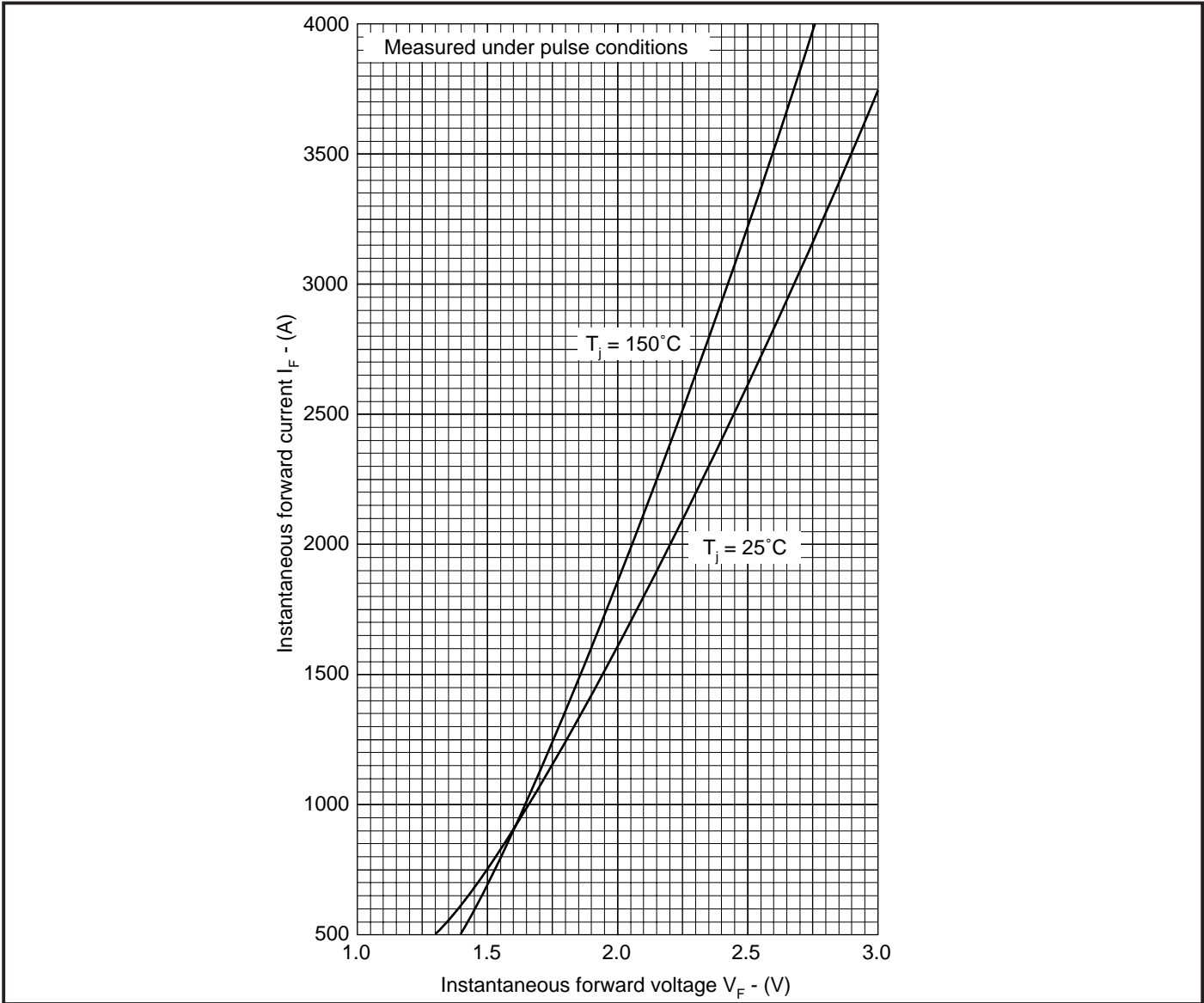


Fig.1 Maximum (limit) forward characteristics

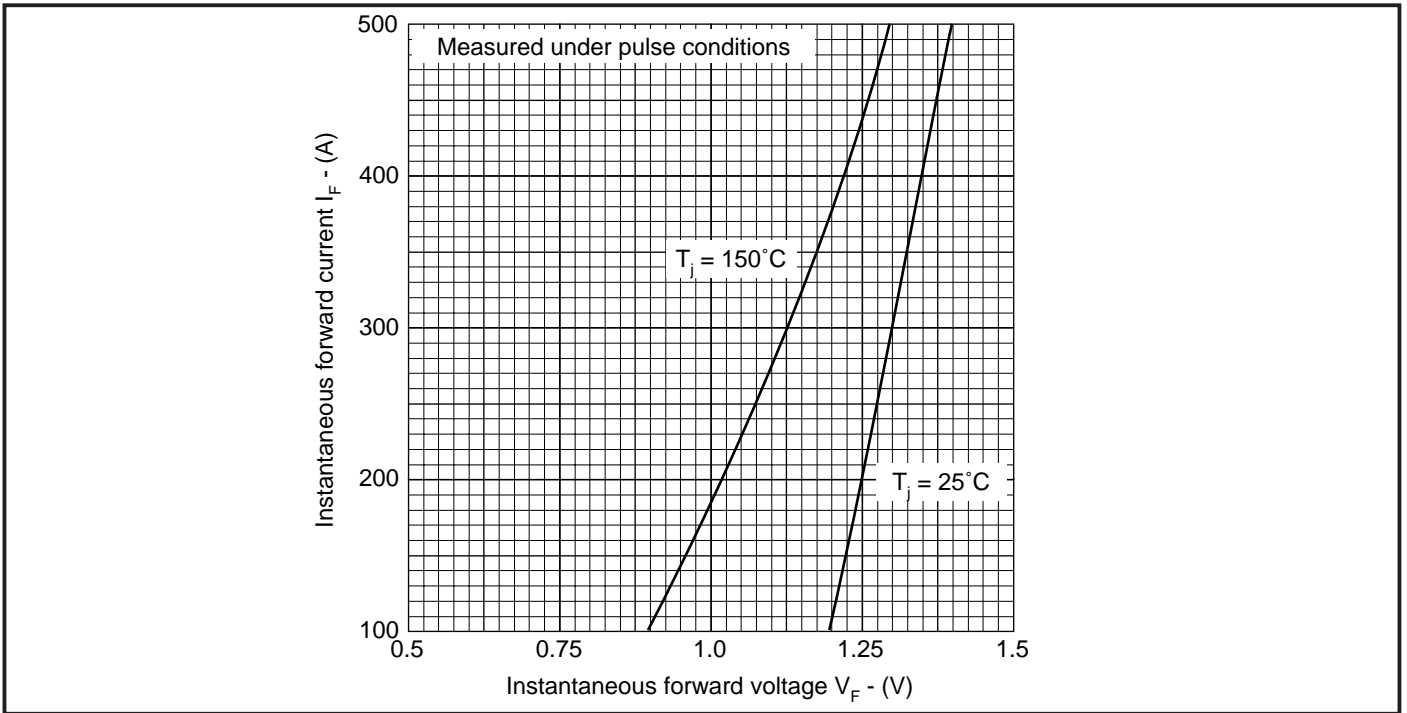


Fig.2 Maximum (limit) forward characteristics

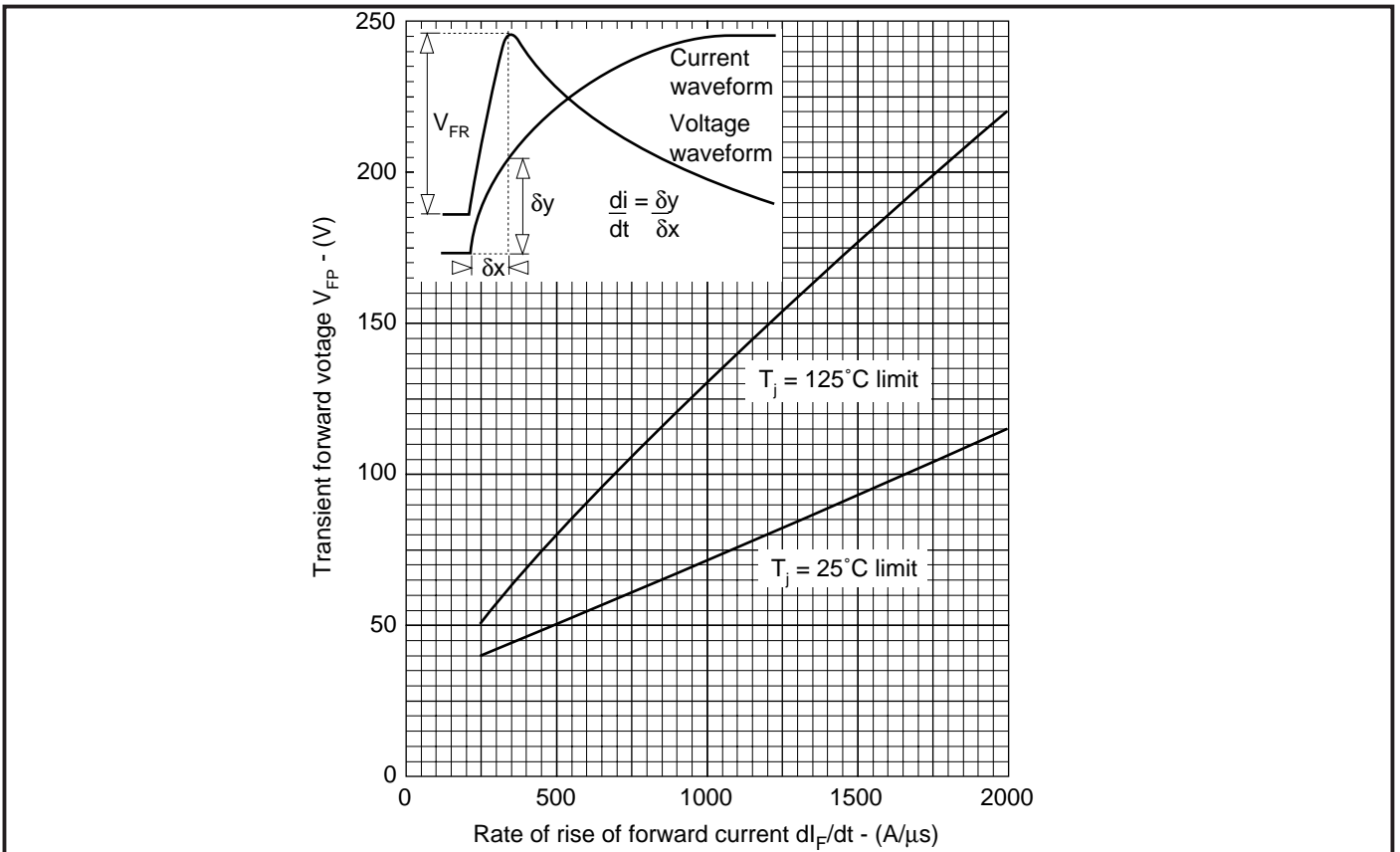


Fig.3 Transient forward voltage vs rate of rise of forward current

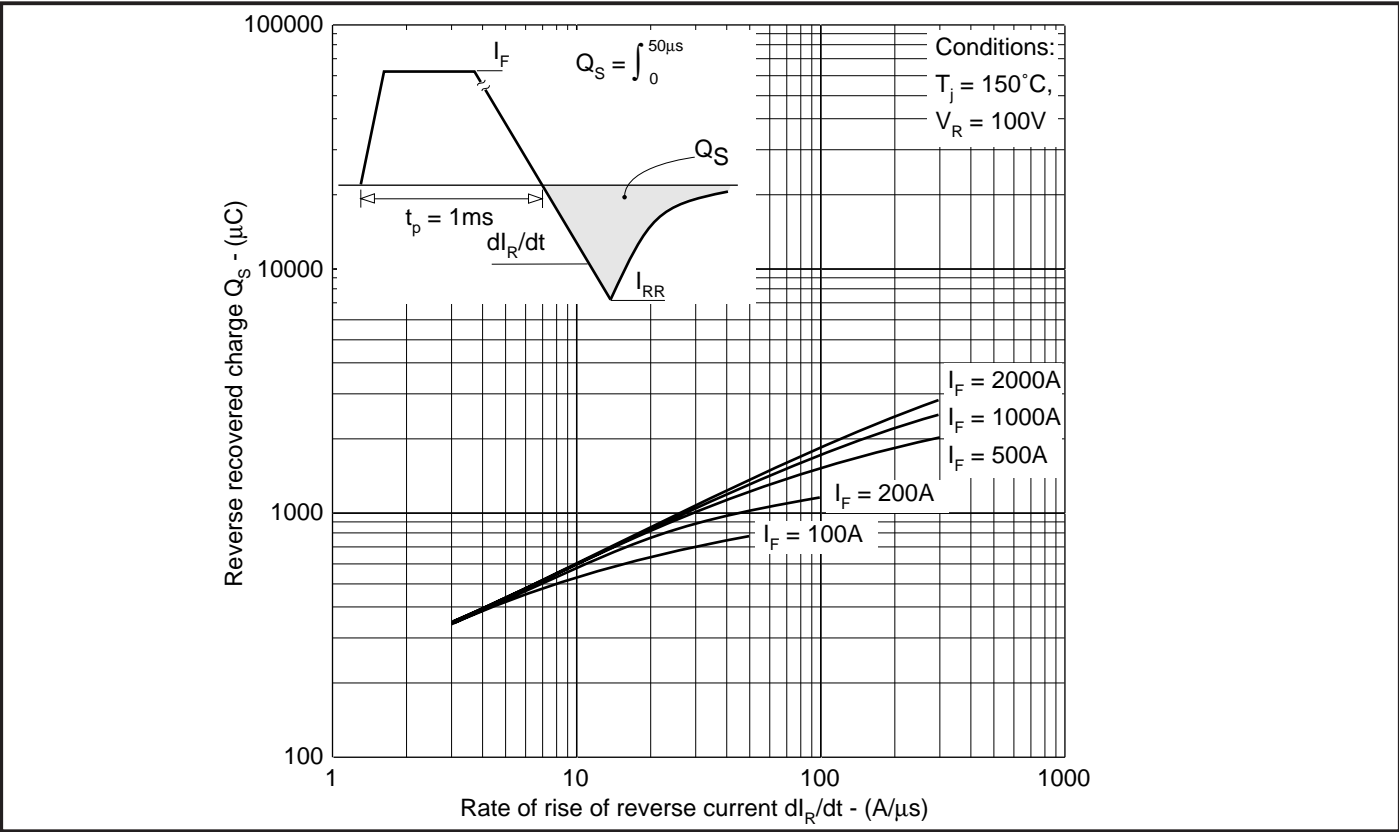


Fig.4 Recovered charge

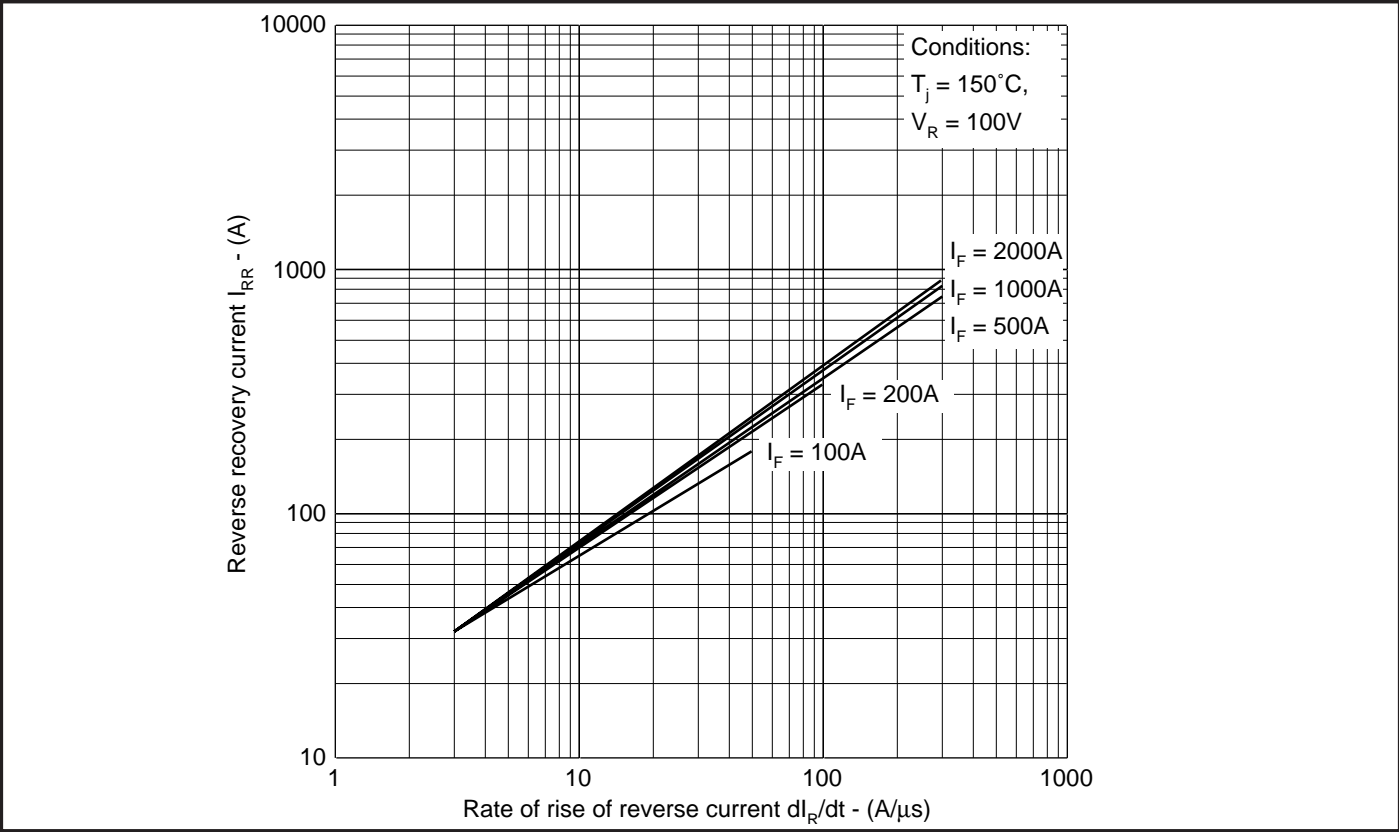


Fig.5 Typical reverse recovery current vs rate of rise of reverse current

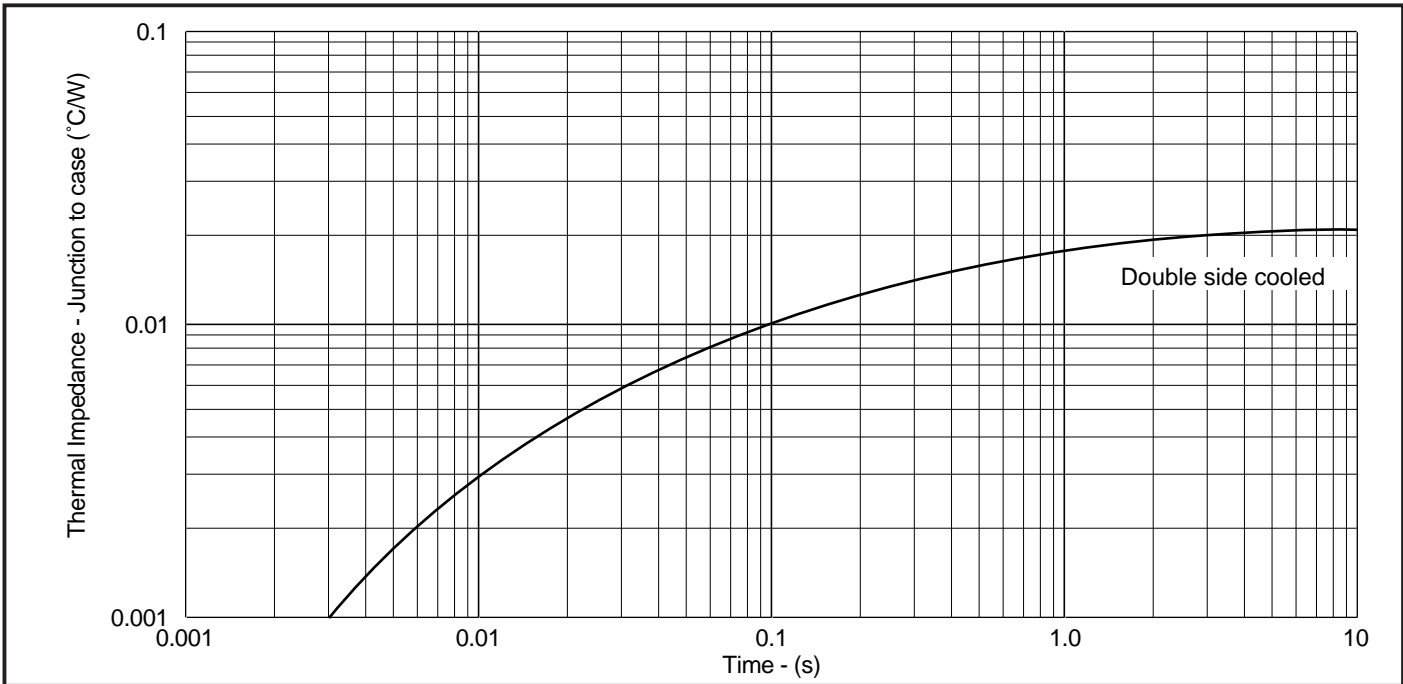
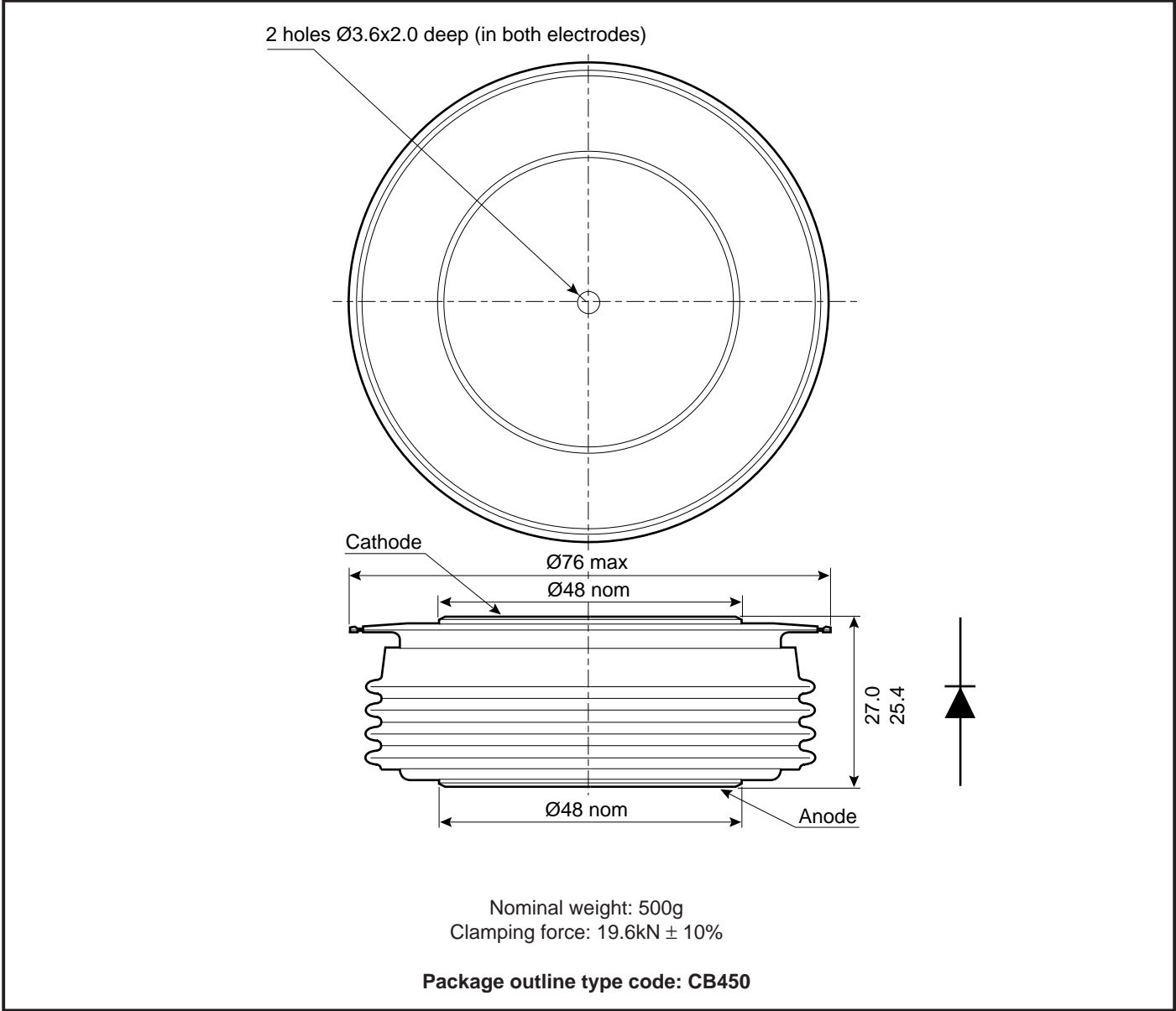


Fig.6 Maximum (limit) transient thermal impedance - junction to case - (°C/W)

PACKAGE DETAILS

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



ASSOCIATED PUBLICATIONS

Title	Application Note Number
Calculating the junction temperature or power semiconductors	AN4506
Recommendations for clamping power semiconductors	AN4839
Thyristor and diode measurement with a multi-meter	AN4853
Use of V_{TO} , r_T on-state characteristic	AN5001



IMPORTANT INFORMATION:

This publication is provided for information only and not for resale.

The products and information in this publication are intended for use by appropriately trained technical personnel.

Due to the diversity of product applications, the information contained herein is provided as a general guide only and does not constitute any guarantee of suitability for use in a specific application. The user must evaluate the suitability of the product and the completeness of the product data for the application. The user is responsible for product selection and ensuring all safety and any warning requirements are met. Should additional product information be needed please contact Customer Service.

Although we have endeavoured to carefully compile the information in this publication it may contain inaccuracies or typographical errors. The information is provided without any warranty or guarantee of any kind.

This publication is an uncontrolled document and is subject to change without notice. When referring to it please ensure that it is the most up to date version and has not been superseded.

The products are not intended for use in applications where a failure or malfunction may cause loss of life, injury or damage to property. The user must ensure that appropriate safety precautions are taken to prevent or mitigate the consequences of a product failure or malfunction.

The products must not be touched when operating because there is a danger of electrocution or severe burning. Always use protective safety equipment such as appropriate shields for the product and wear safety glasses. Even when disconnected any electric charge remaining in the product must be discharged and allowed to cool before safe handling using protective gloves.

Extended exposure to conditions outside the product ratings may affect reliability leading to premature product failure. Use outside the product ratings is likely to cause permanent damage to the product. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture, a large current to flow or high voltage arcing, resulting in fire or explosion. Appropriate application design and safety precautions should always be followed to protect persons and property.

Product Status & Product Ordering:

We annotate datasheets in the top right hand corner of the front page, to indicate product status if it is not yet fully approved for production. The annotations are as follows:-

Target Information:	This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.
Preliminary Information:	The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change.
No Annotation:	The product has been approved for production and unless otherwise notified by Dynex any product ordered will be supplied to the current version of the data sheet prevailing at the time of our order acknowledgement.

All products and materials are sold and services provided subject to Dynex's conditions of sale, which are available on request.

Any brand names and product names used in this publication are trademarks, registered trademarks or trade names of their respective owners.

HEADQUARTERS OPERATIONS

DYNEX SEMICONDUCTOR LIMITED
Doddington Road, Lincoln, Lincolnshire, LN6 3LF
United Kingdom.
Phone: +44 (0) 1522 500500
Fax: +44 (0) 1522 500550
Web: <http://www.dynexsemi.com>

CUSTOMER SERVICE

Phone: +44 (0) 1522 502753 / 502901
Fax: +44 (0) 1522 500020
e-mail: power_solutions@dynexsemi.com