DSF21545SV

Fast Recovery Diode

DS4153-5 July 2014 (LN31805)

APPLICATIONS

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

KEY PARAMETERS

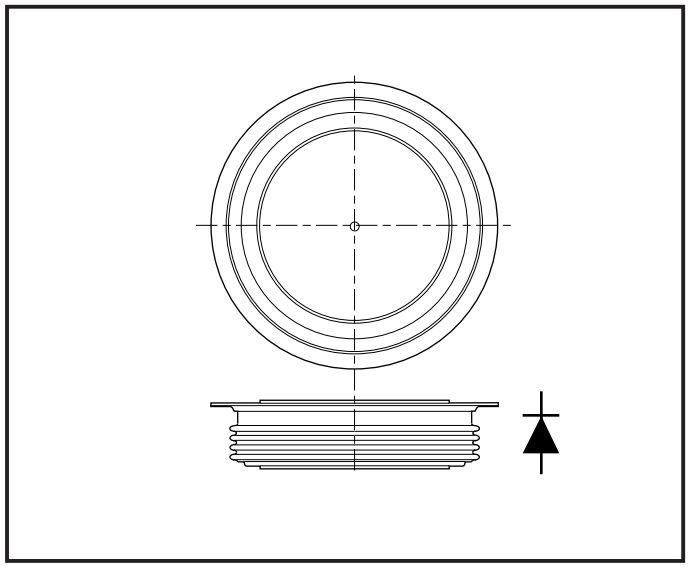
V_{RRM}	4500V
$I_{F(AV)}$	3230A
I_{FSM}	20000A
Q_r	1800μC
t_{rr}	7.0μs

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.



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

VOLTAGE RATINGS

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

Lower voltage grades available.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	3230	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	5080	A
I_F	Continuous (direct) forward current	T_{case} = 65°C	4680	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 65°C	2070	A
$I_{F(RMS)}$	RMS value	T_{case} = 65°C	3255	A
I_F	Continuous (direct) forward current	T_{case} = 65°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°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°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°C	-	kA
I^2t	I^2t for fusing		-	A^2s

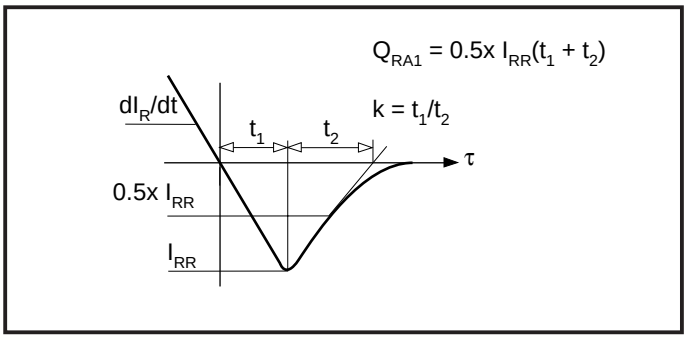
THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0075	°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	Double side	-	0.002	°C/W
			Single side	-	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°C	-	2.0	V
I_{RRM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	150	mA
t_{rr}	Reverse recovery time	I_F = 1000A, di_{RR}/dt = 100A/µs T_{case} = 150°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°C	-	1.25	V
r_T	Slope resistance	At T_{vj} = 150°C	-	0.25	mΩ
V_{FRM}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 125°C	-	75	V

DEFINITION OF K FACTOR AND Q_{RA1}



CURVES

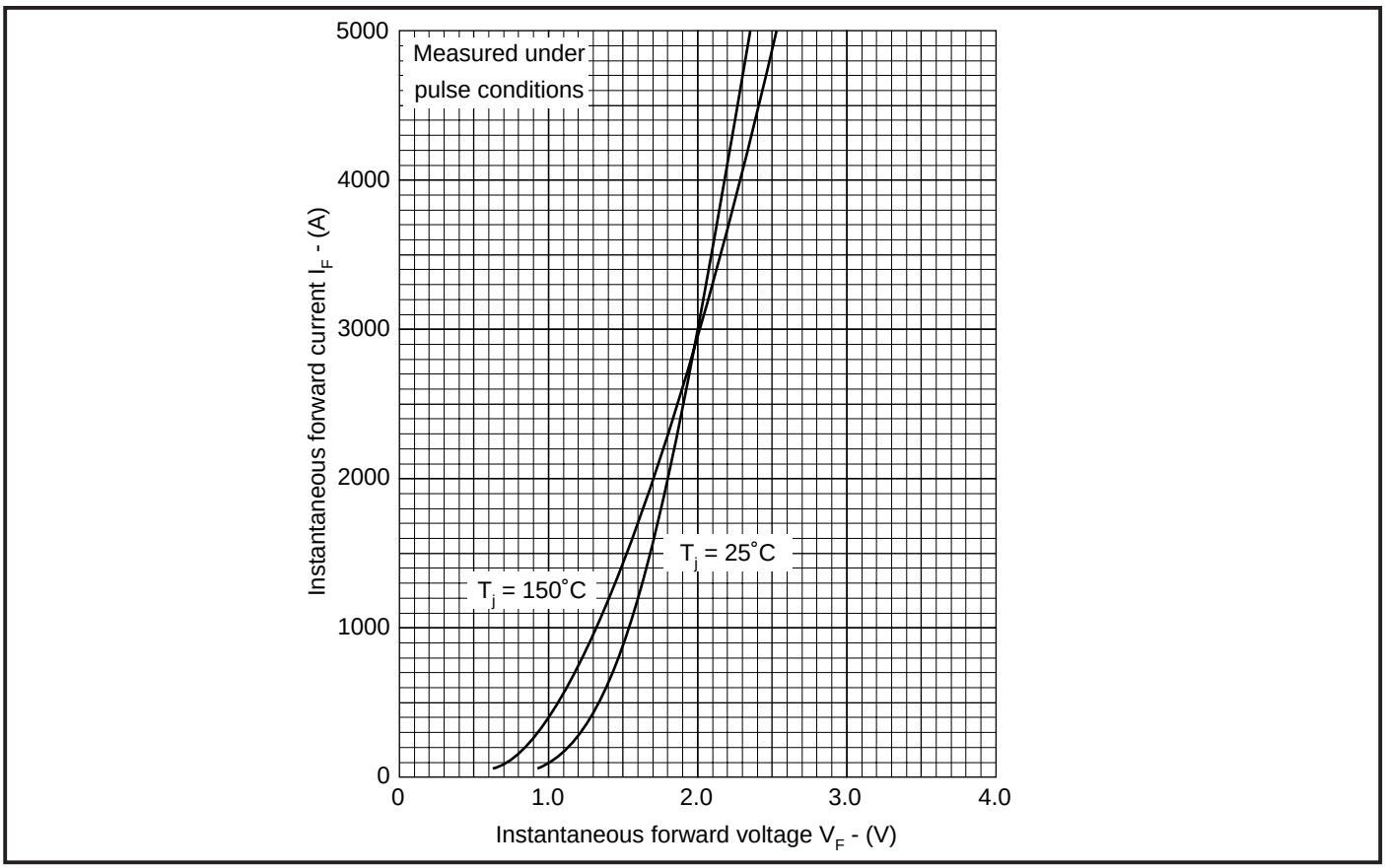


Fig.1 Maximum (limit) forward characteristics

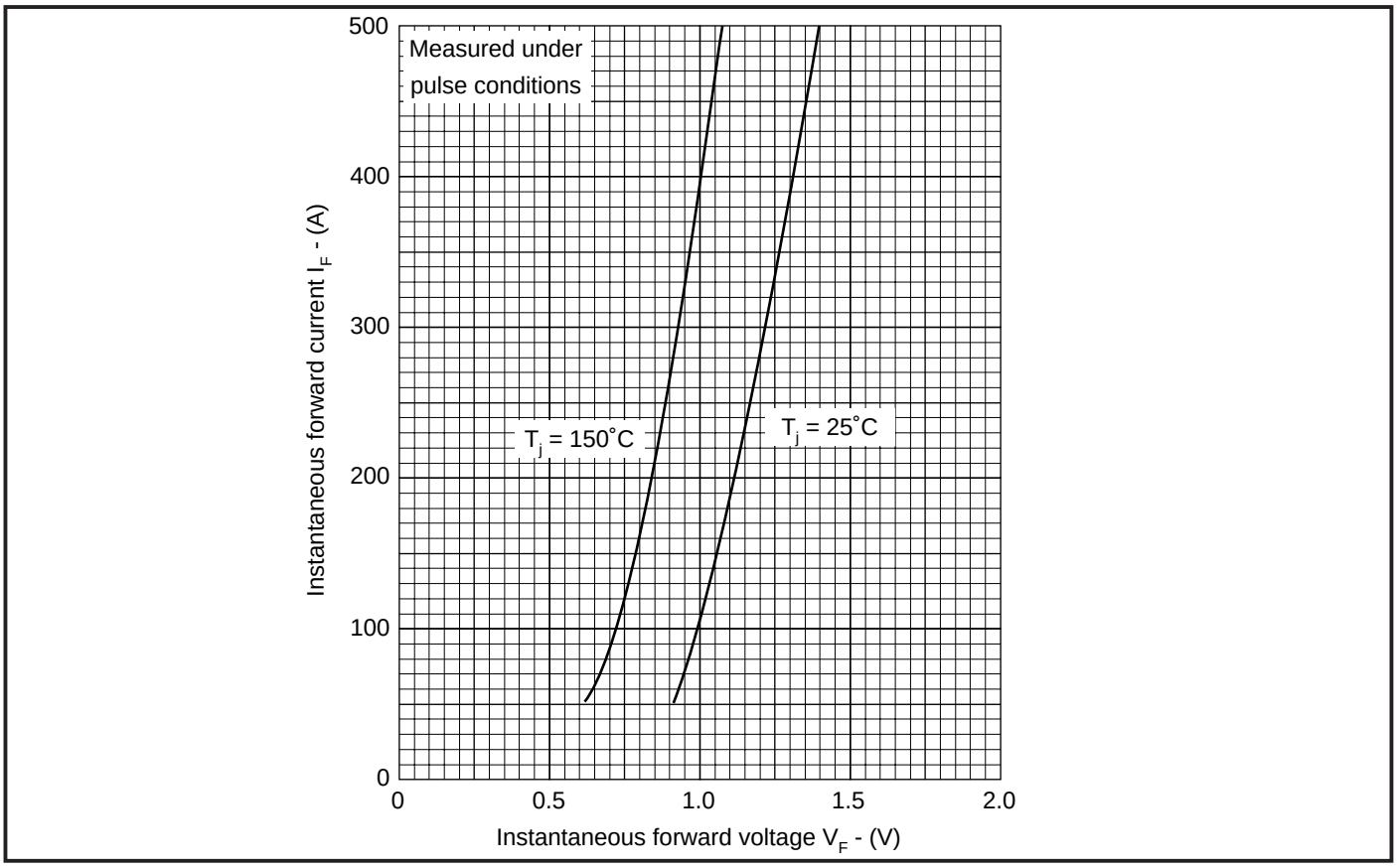


Fig.2 Maximum (limit) forward characteristics

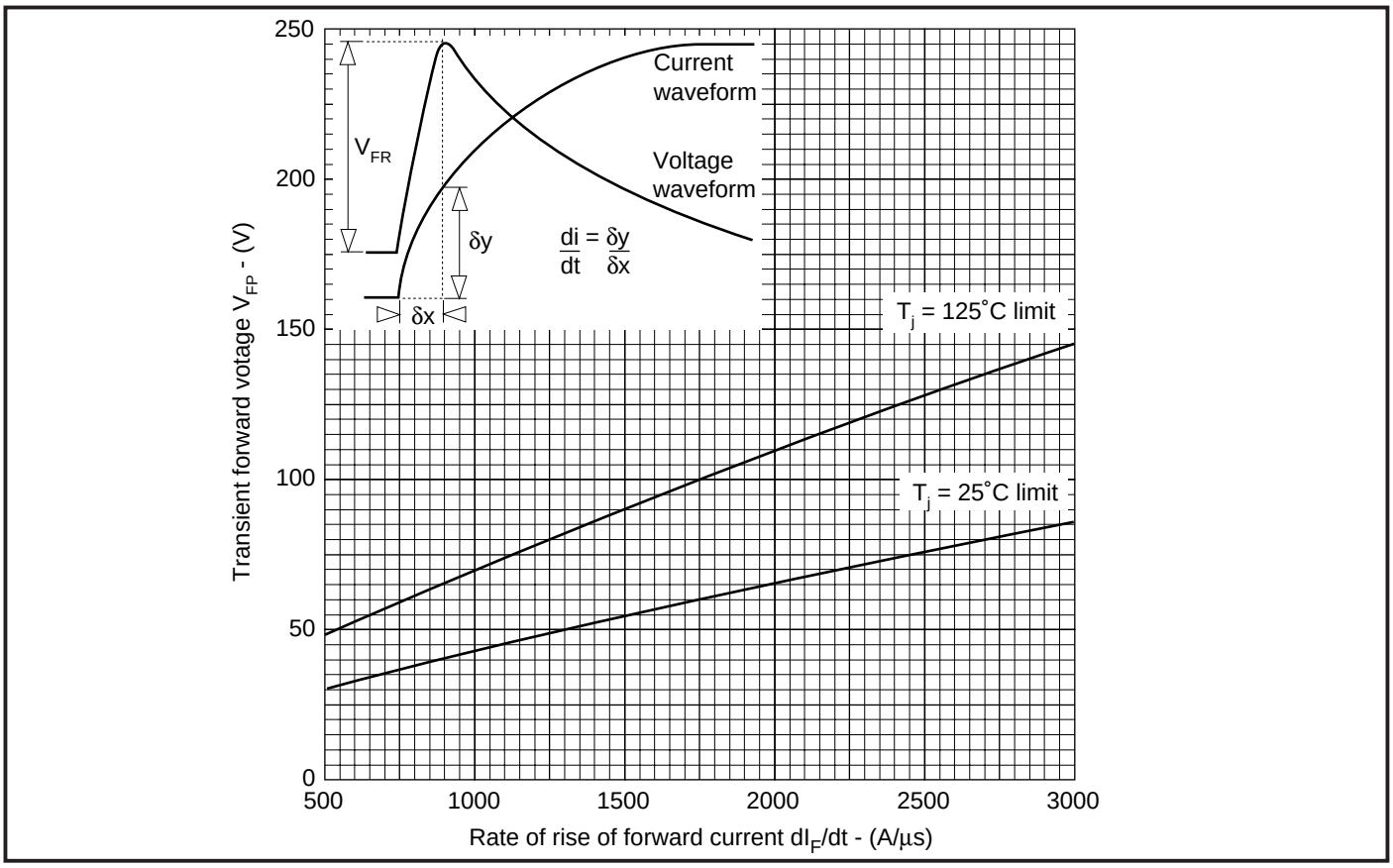


Fig.3 Transient forward voltage vs rate of rise of forward current

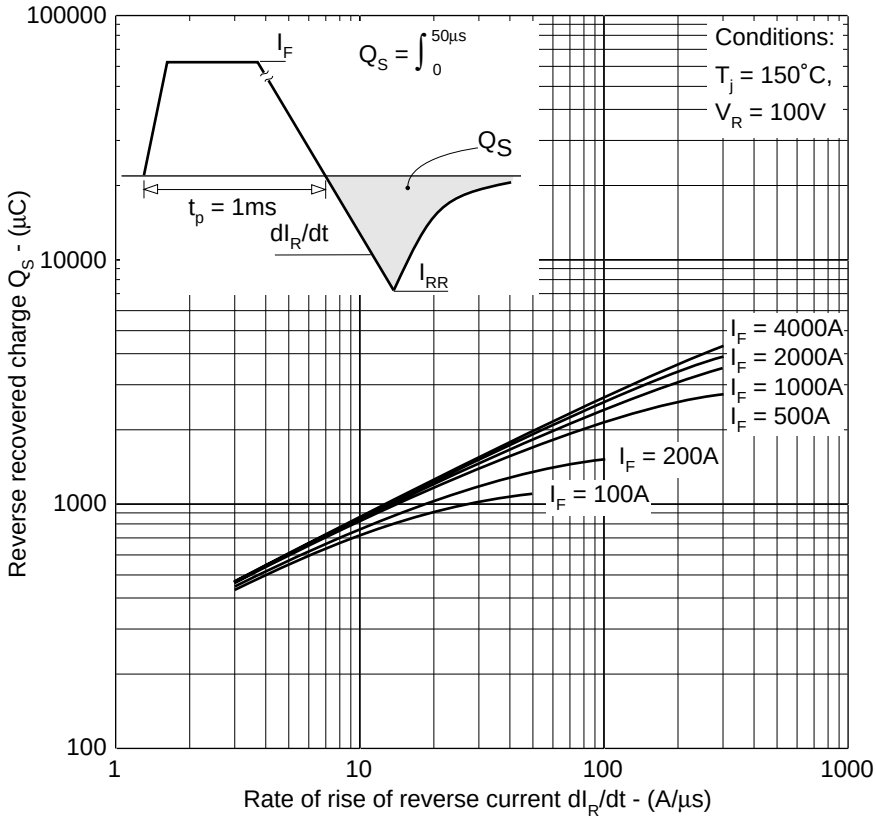


Fig.4 Recovered charge

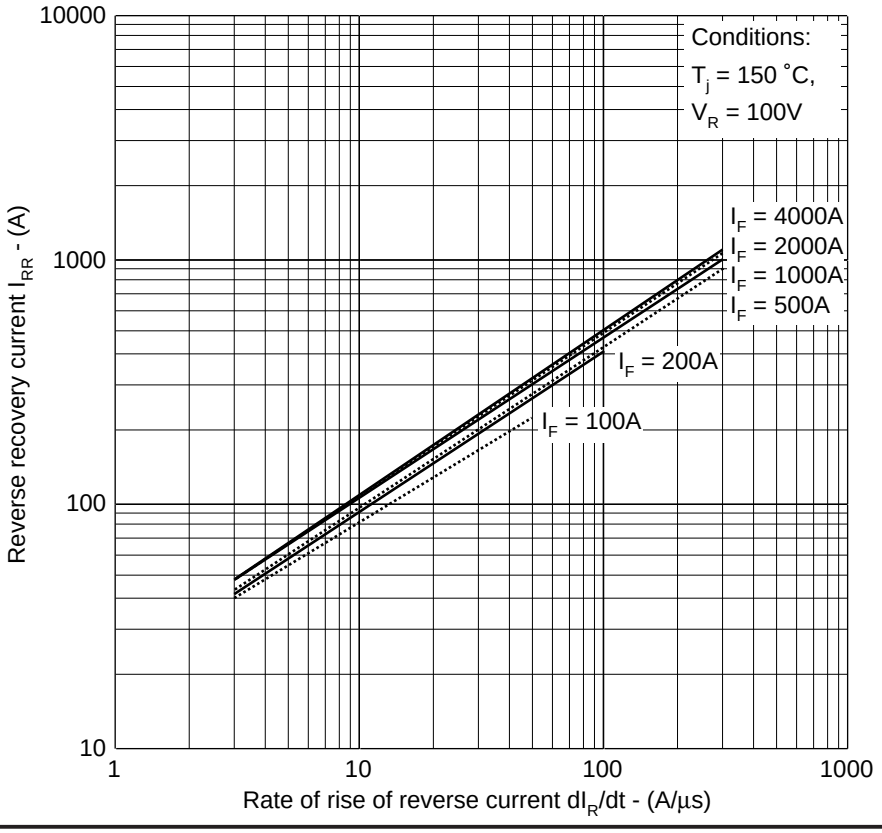


Fig.5 Typical reverse recovery current vs rate of rise of reverse current

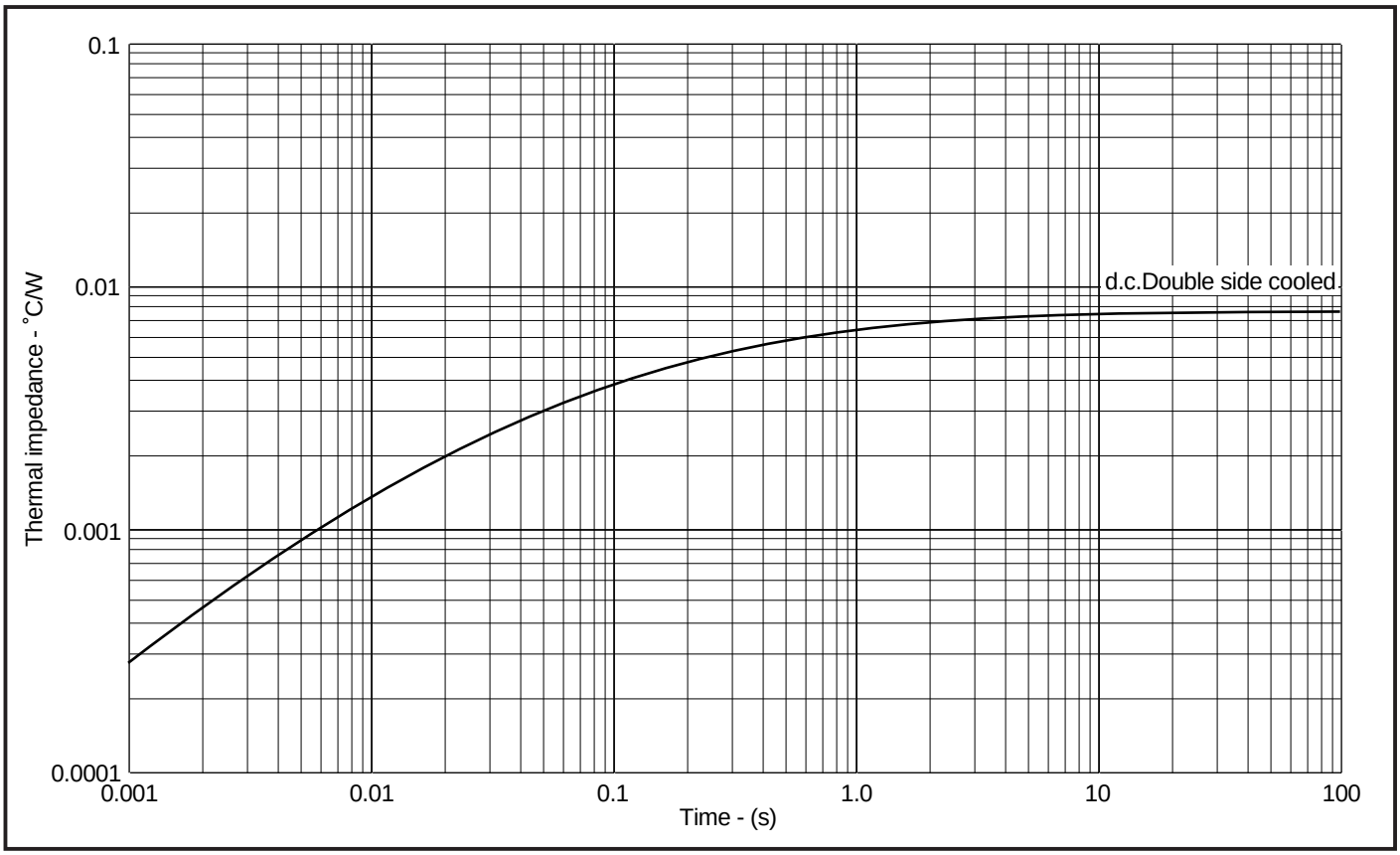
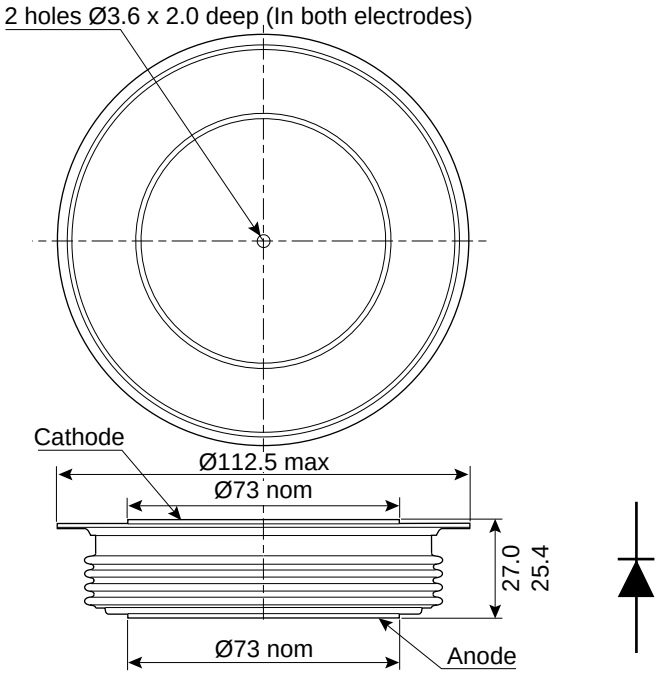


Fig.5 Maximum (limit) transient thermal impedance - junction to case

PACKAGE DETAILS

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



Nominal weight: 1100g
Clamping force: 43kN ±10%

Package outine type code: V

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

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