

**FEATURES**

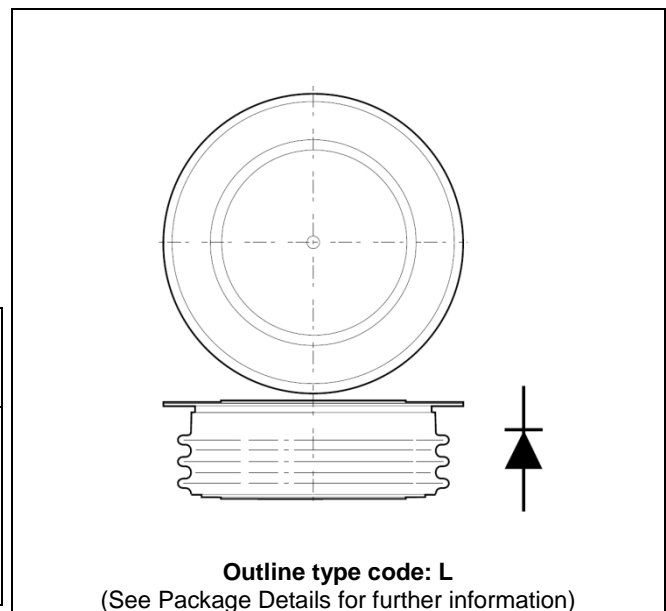
- Double Side Cooling
- High Surge Capability

**KEY PARAMETERS**

$V_{RRM}$	<b>4500V</b>
$I_{F(AV)}$	<b>2000A</b>
$I_{FSM}$	<b>31000A</b>

**VOLTAGE RATINGS**

Part and Ordering Number	Repetitive Peak Voltages $V_{RRM}$ V	Conditions
DRD2000L45	4500	$V_{RSM} = V_{RRM} + 100V$
DRD2000L44	4400	
DRD2000L42	4200	
DRD2000L40	4000	



**Fig. 1 Package outline**

**ORDERING INFORMATION**

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

For example:

**DRD2000L42** for a 4200V device

**CURRENT RATINGS**

T<sub>case</sub> = 75°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
<b>Double Side Cooled</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	2590	A
I <sub>F(RMS)</sub>	RMS value	-	4068	A
I <sub>F</sub>	Continuous (direct) on-state current	-	3727	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	1940	A
I <sub>F(RMS)</sub>	RMS value	-	3047	A
I <sub>F</sub>	Continuous (direct) on-state current	-	2656	A

T<sub>case</sub> = 100°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
<b>Double Side Cooled</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	2000	A
I <sub>F(RMS)</sub>	RMS value	-	3140	A
I <sub>F</sub>	Continuous (direct) on-state current	-	2800	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	1284	A
I <sub>F(RMS)</sub>	RMS value	-	2017	A
I <sub>F</sub>	Continuous (direct) on-state current	-	1715	A

**SURGE RATINGS**

Symbol	Parameter	Test Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 50\% V_{RRM} - \frac{1}{4}$ sine	24.8	kA
$I^2t$	$I^2t$ for fusing		3.075	MA <sup>2</sup> s
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 0$	31.0	kA
$I^2t$	$I^2t$ for fusing		4.8	MA <sup>2</sup> s

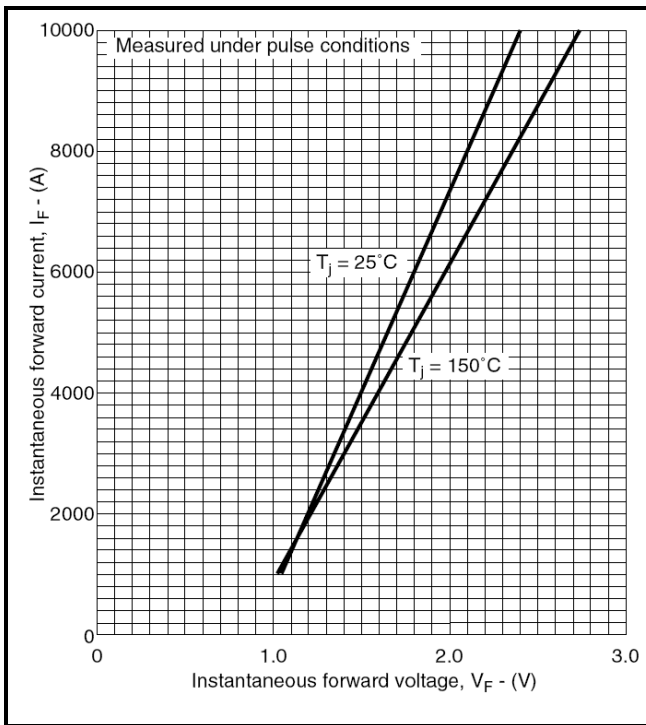
**THERMAL AND MECHANICAL RATINGS**

Symbol	Parameter	Test Conditions	Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled	DC	-	0.013	$^{\circ}C/W$
		Single side cooled	Anode DC	-	0.025	$^{\circ}C/W$
			Cathode DC	-	0.027	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 45kN (with mounting compound)	Double side	-	0.003	$^{\circ}C/W$
			Single side	-	0.006	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	160	$^{\circ}C$
		Reverse (blocking)		-	150	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	175	$^{\circ}C$
$F_m$	Clamping force			40	48	kN

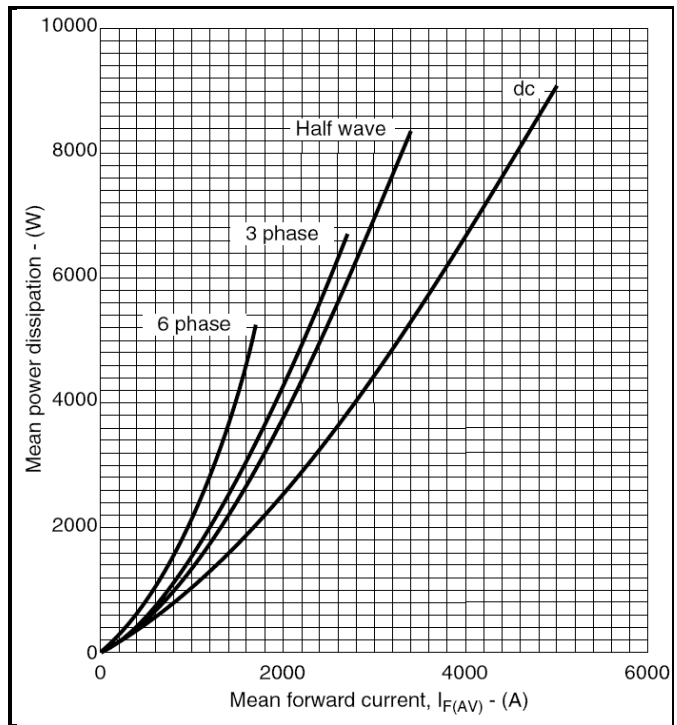
**CHARACTERISTICS**

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V <sub>FM</sub>	Forward voltage	At 3000A peak, T <sub>case</sub> = 25°C	-	1.45	V
I <sub>RM</sub>	Peak reverse current	At V <sub>RRM</sub> , T <sub>case</sub> = 150°C	-	150	mA
Q <sub>S</sub>	Total stored charge	I <sub>F</sub> = 1500A, dI <sub>RR</sub> /dt = 25A/μs	-	6000	μC
I <sub>rr</sub>	Peak reverse recovery current	T <sub>case</sub> = 25°C, V <sub>R</sub> = 100V	-	500	A
V <sub>TO</sub>	Threshold voltage	At T <sub>vj</sub> = 150°C	-	0.84	V
r <sub>T</sub>	Slope resistance	At T <sub>vj</sub> = 150°C	-	0.19	mΩ

**CURVES**



**Fig.2 Maximum (limit) on-state characteristics**



**Fig.3 Dissipation curves**

**V<sub>TM</sub> EQUATION**

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

Where A = -0.36984  
 B = 0.292197  
 C = 0.000354  
 D = -0.03111

these values are valid for T<sub>j</sub> = 150°C for I<sub>F</sub> 500A to 10000A

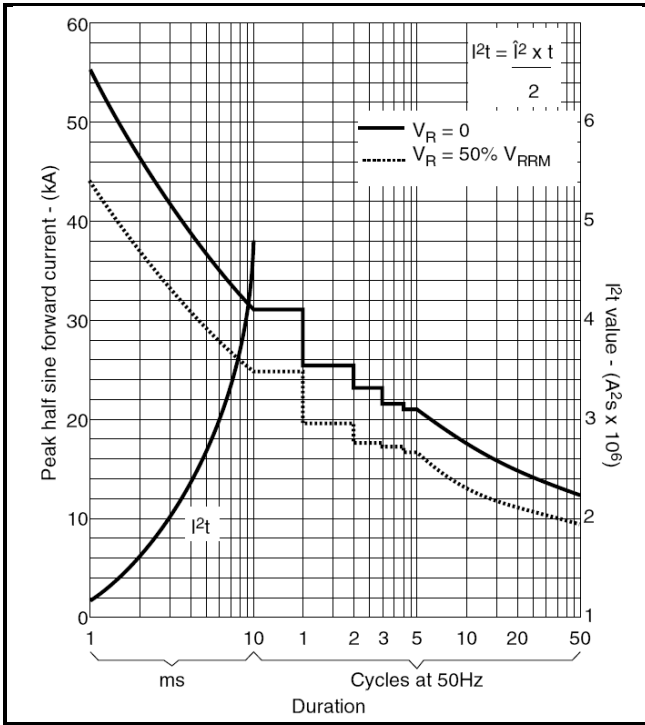


Fig.4 Surge (non-repetitive) forward current vs time ( $T_{case} 150^\circ C$ )

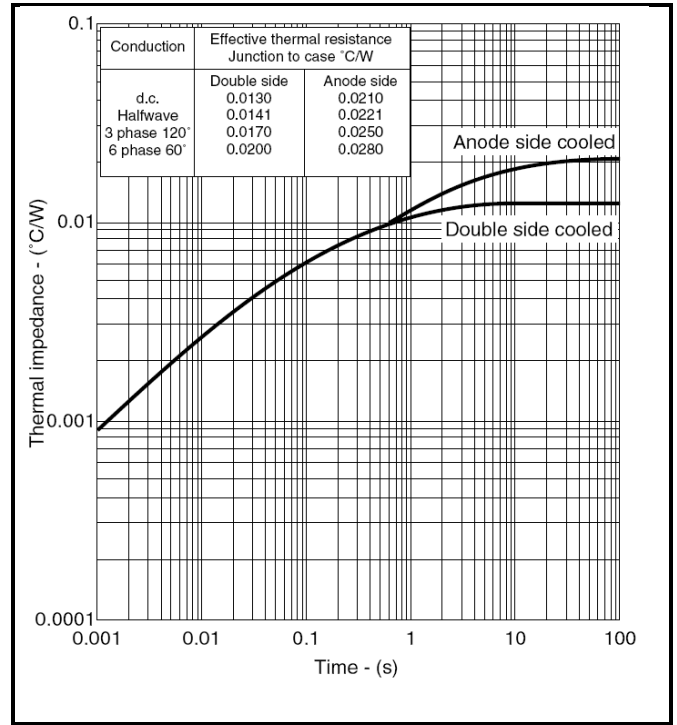
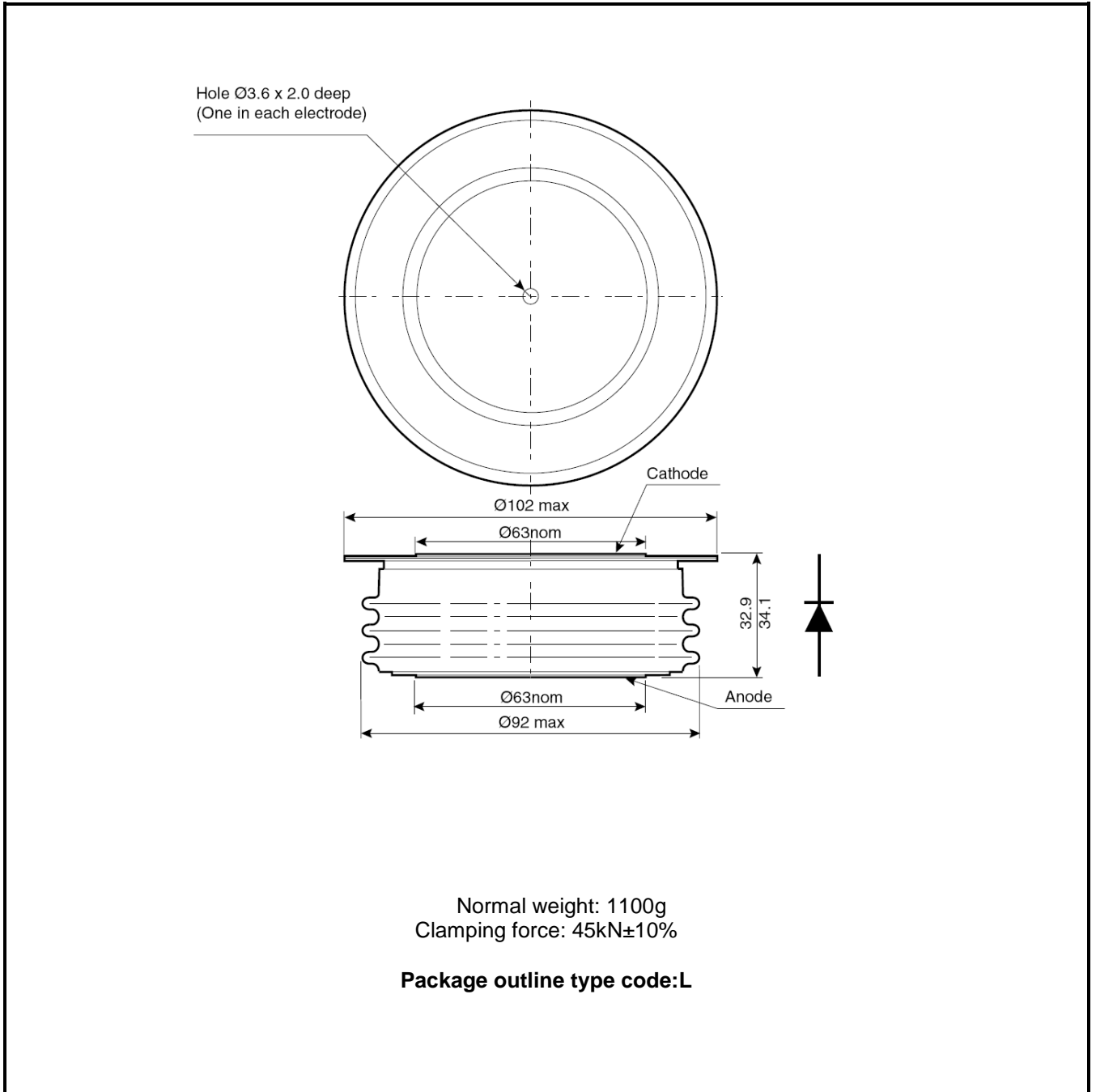


Fig.5 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



**Note:**  
Some packages may be supplied with gate and or tags.

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