

**FEATURES**

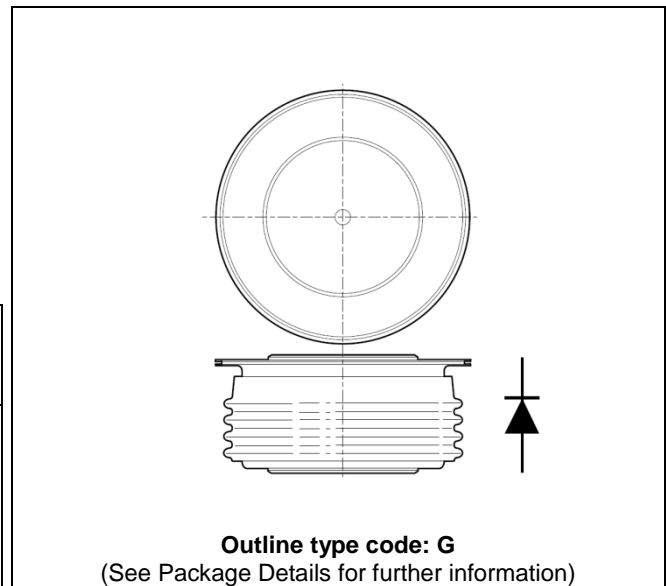
- Double Side Cooling
- High Surge Capability

**KEY PARAMETERS**

$V_{RRM}$	<b>4000V</b>
$I_{F(AV)}$	<b>870A</b>
$I_{FSM}$	<b>15000A</b>

**VOLTAGE RATINGS**

Part and Ordering Number	Repetitive Peak Voltages $V_{RRM}$ V	Conditions
DRD870G40 DRD870G38 DRD870G36 DRD870G34	4000 3800 3600 3400	$V_{RSM} = V_{RRM} + 100V$



**Fig. 1 Package outline**

**ORDERING INFORMATION**

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

For example:

**DRD870G36** for a 3600V 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	1121	A
I <sub>F(RMS)</sub>	RMS value	-	1761	A
I <sub>F</sub>	Continuous (direct) on-state current	-	1608	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	734	A
I <sub>F(RMS)</sub>	RMS value	-	1154	A
I <sub>F</sub>	Continuous (direct) on-state current	-	989	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	870	A
I <sub>F(RMS)</sub>	RMS value	-	1366	A
I <sub>F</sub>	Continuous (direct) on-state current	-	1280	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	550	A
I <sub>F(RMS)</sub>	RMS value	-	863	A
I <sub>F</sub>	Continuous (direct) on-state current	-	740	A

**SURGE RATINGS**

Symbol	Parameter	Test Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 50\% V_{RRM} - 1/4$ sine	12	kA
$I^2t$	$I^2t$ for fusing		0.72	$MA^2s$
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 0$	15	kA
$I^2t$	$I^2t$ for fusing		1.125	$MA^2s$

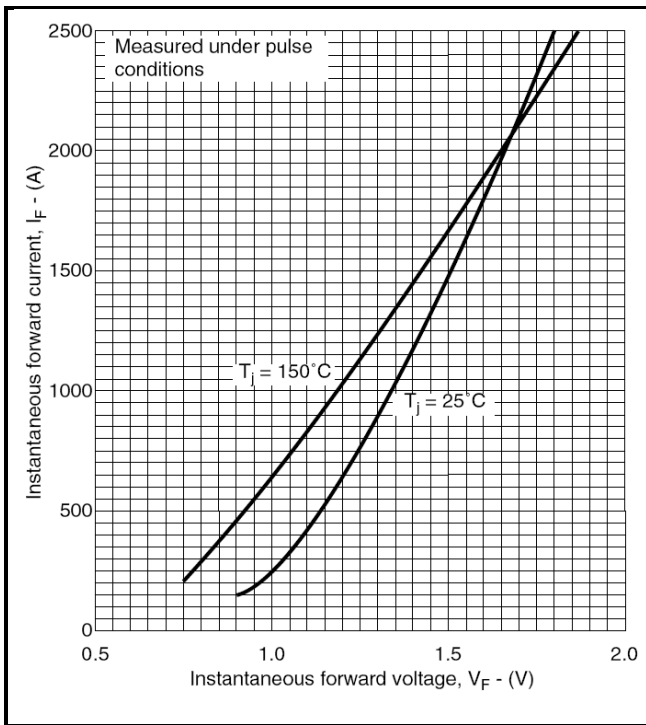
**THERMAL AND MECHANICAL RATINGS**

Symbol	Parameter	Test Conditions	Min.	Max.	Units	
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled	DC	-	0.032	$^{\circ}C/W$
		Single side cooled	Anode DC	-	0.064	$^{\circ}C/W$
			Cathode DC	-	0.064	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 12kN (with mounting compound)	Double side	-	0.008	$^{\circ}C/W$
			Single side	-	0.016	$^{\circ}C/W$
$T_{vj}$	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		11.5	13.5	kN	

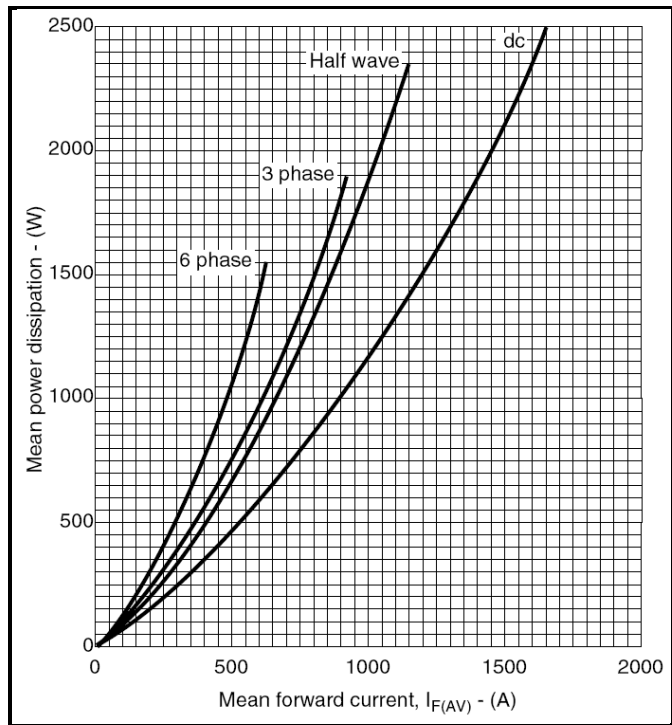
**CHARACTERISTICS**

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V <sub>FM</sub>	Forward voltage	At 1800A peak, T <sub>case</sub> = 25°C	-	1.6	V
I <sub>RM</sub>	Peak reverse current	At V <sub>RRM</sub> , T <sub>case</sub> = 150°C	-	50	mA
Q <sub>S</sub>	Total stored charge	I <sub>F</sub> = 1000A, dI <sub>RR</sub> /dt = 3A/μs	-	2000	μC
I <sub>rr</sub>	Peak reverse recovery current	T <sub>case</sub> = 150°C, V <sub>R</sub> = 100V	-	80	A
V <sub>TO</sub>	Threshold voltage	At T <sub>vj</sub> = 150°C	-	0.75	V
r <sub>T</sub>	Slope resistance	At T <sub>vj</sub> = 150°C	-	0.44	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 = 0.616461  
 B = -0.01452  
 C = 0.000349  
 D = 0.009952

these values are valid for T<sub>j</sub> = 150°C for I<sub>F</sub> 500A to 2500A

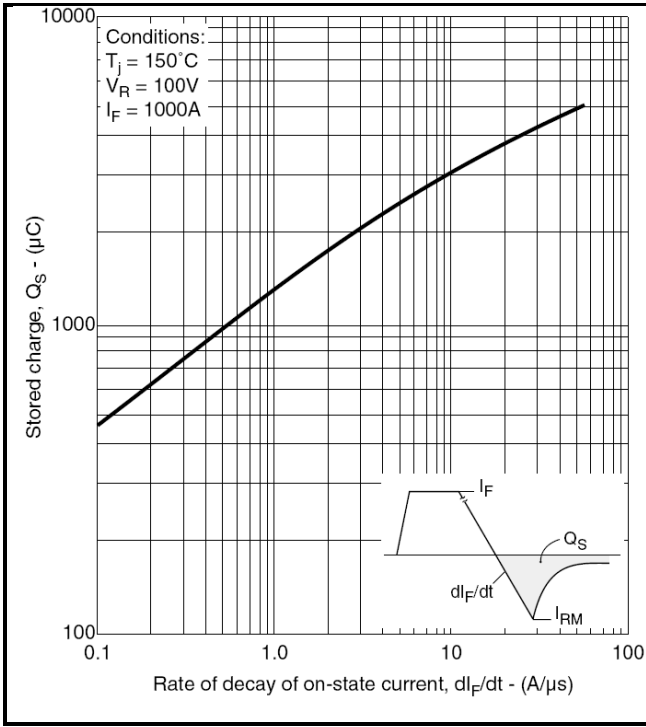


Fig.4 Total stored charge

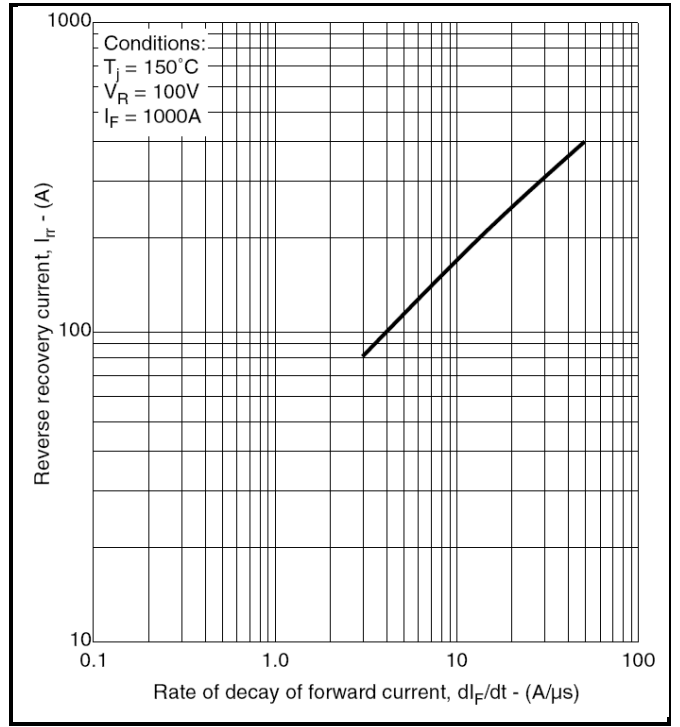


Fig.5 Maximum reverse recovery current

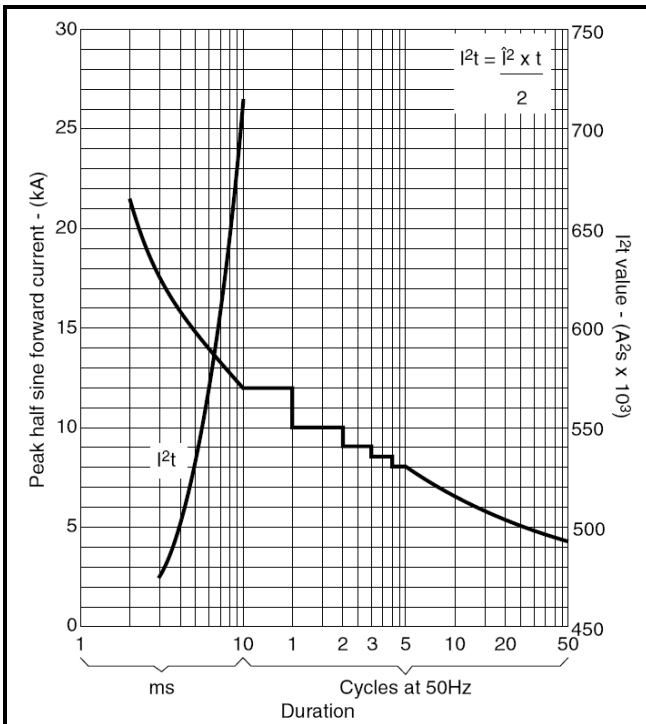


Fig.6 Surge (non-repetitive) forward current vs time (with 50%  $V_{RRM}$  at  $T_{case} 150^\circ\text{C}$ )

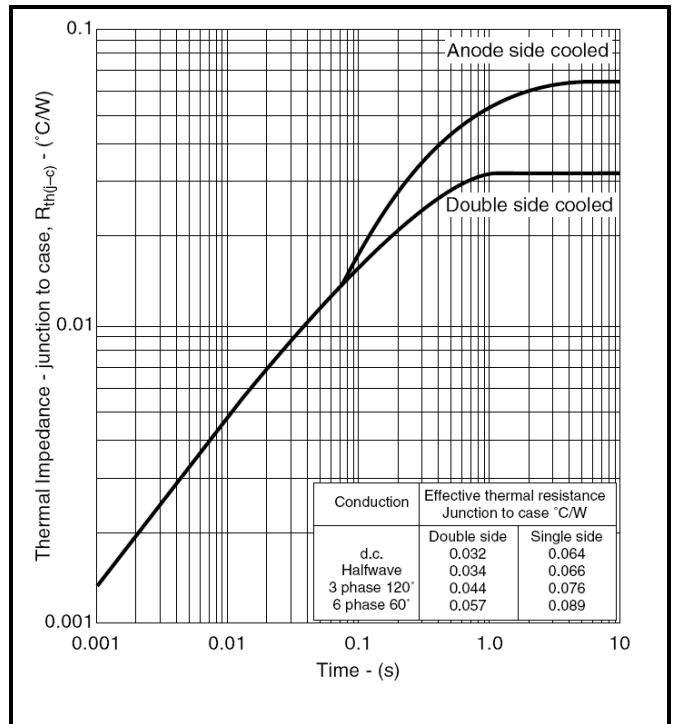
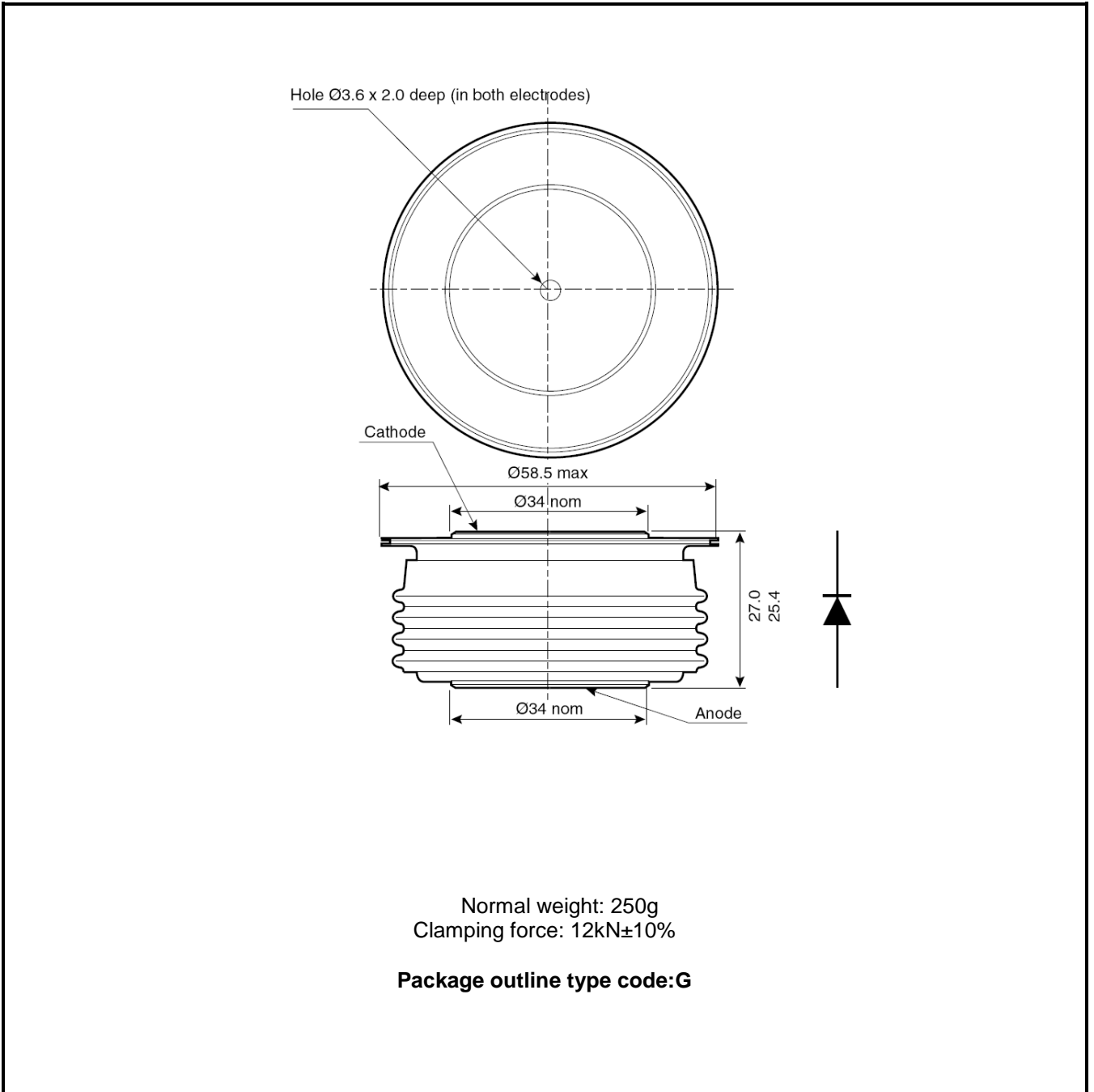


Fig.7 Maximum (limit) transient thermal impedance-junction to case

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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