DRD870G40

Rectifier Diode

DS5986-1 January 2011 (LN28007)

FEATURES

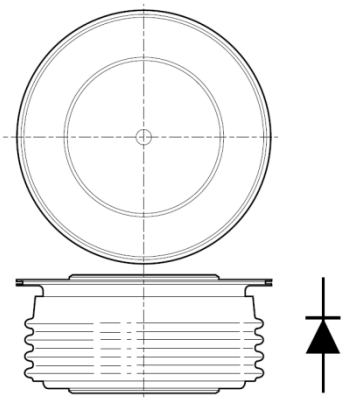
- Double Side Cooling
- High Surge Capability

KEY PARAMETERS

V_{RRM}	**4000V**
$I_{F(AV)}$	**870A**
I_{FSM}	**15000A**

VOLTAGE RATINGS

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



Outline type code: G
(See Package Details for further information)

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_{case} = 75°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	1121	A
$I_{F(RMS)}$	RMS value	-	1761	A
I_F	Continuous (direct) on-state current	-	1608	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	734	A
$I_{F(RMS)}$	RMS value	-	1154	A
I_F	Continuous (direct) on-state current	-	989	A

T_{case} = 100°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	870	A
$I_{F(RMS)}$	RMS value	-	1366	A
I_F	Continuous (direct) on-state current	-	1280	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	550	A
$I_{F(RMS)}$	RMS value	-	863	A
I_F	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°C	12	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	0.72	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	15	kA
I^2t	I^2t for fusing	V_R = 0	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	°C/W
		Single side cooled	Anode DC	-	0.064	°C/W
			Cathode DC	-	0.064	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 12kN	Double side	-	0.008	°C/W
		(with mounting compound)	Single side	-	0.016	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	160	°C
		Reverse (blocking)		-	150	°C
T_{stg}	Storage temperature range			-55	175	°C
F_m	Clamping force			11.5	13.5	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 1800A peak, T_{case} = 25°C	-	1.6	V
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	50	mA
Q_S	Total stored charge	I_F = 1000A, dI_{RR}/dt =3A/µs	-	2000	µC
I_{rr}	Peak reverse recovery current	T_{case} = 150°C, V_R =100V	-	80	A
V_{TO}	Threshold voltage	At T_{vj} = 150°C	-	0.75	V
r_T	Slope resistance	At T_{vj} = 150°C	-	0.44	mΩ

CURVES

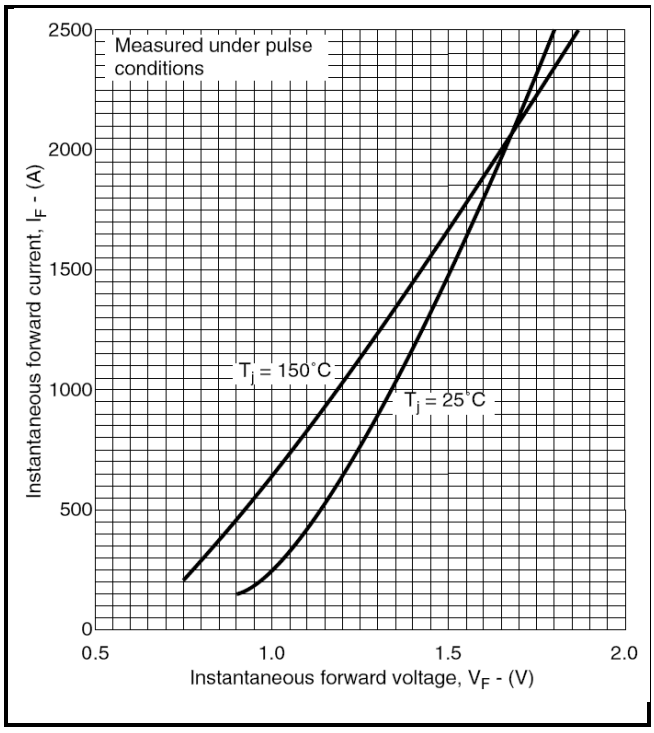


Fig.2 Maximum (limit) on-state characteristics

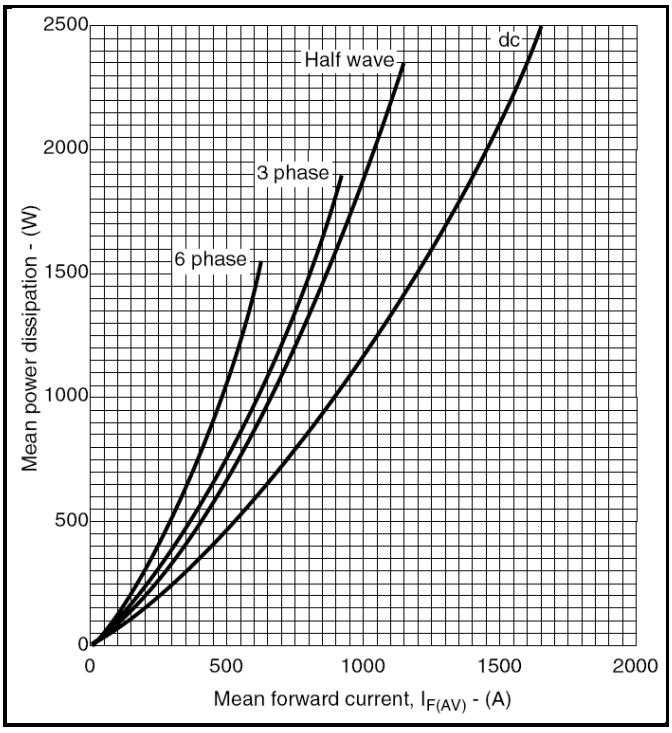


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.616461
B = -0.01452
C = 0.000349
D = 0.009952

these values are valid for T_j = 150°C for I_F 500A to 2500A

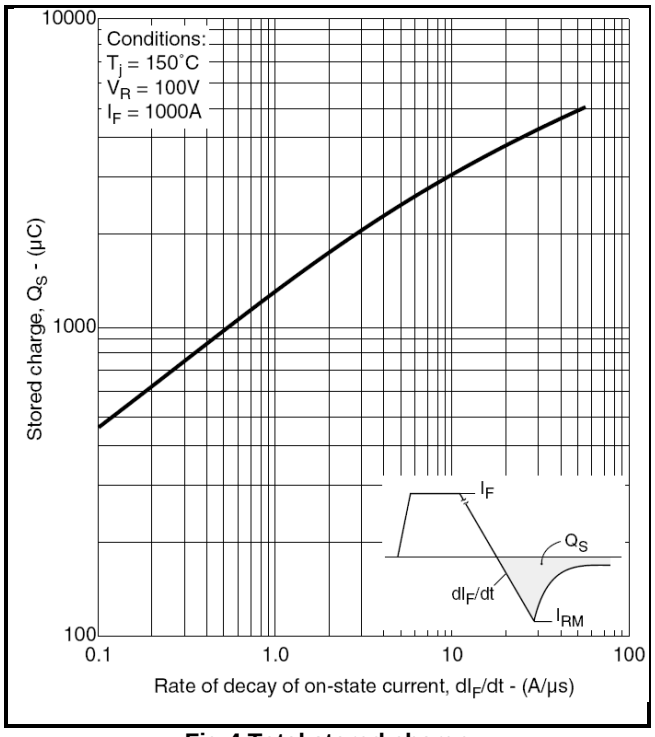


Fig.4 Total stored charge

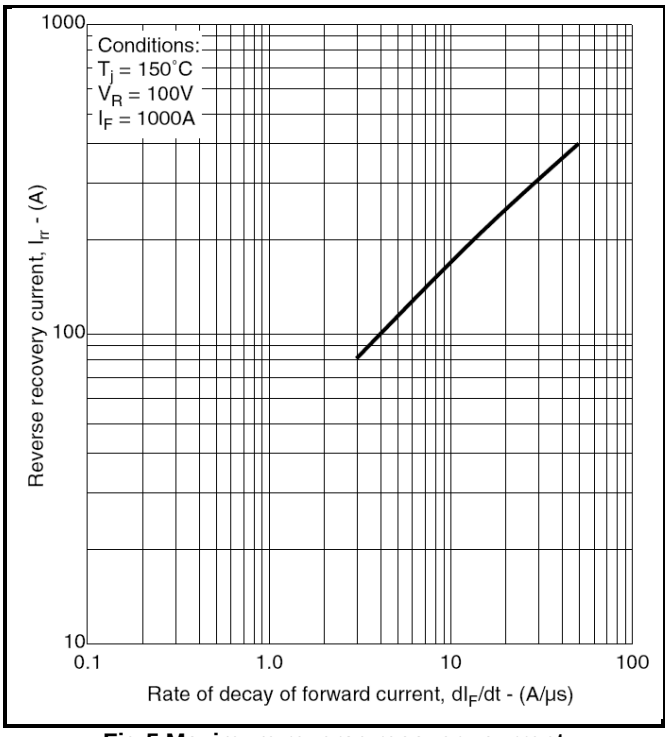


Fig.5 Maximum reverse recovery current

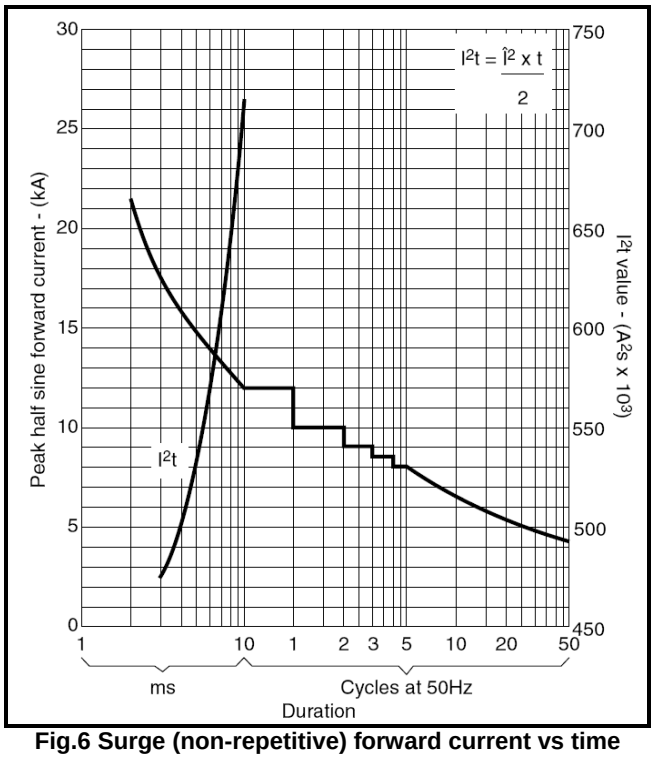


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150°C)

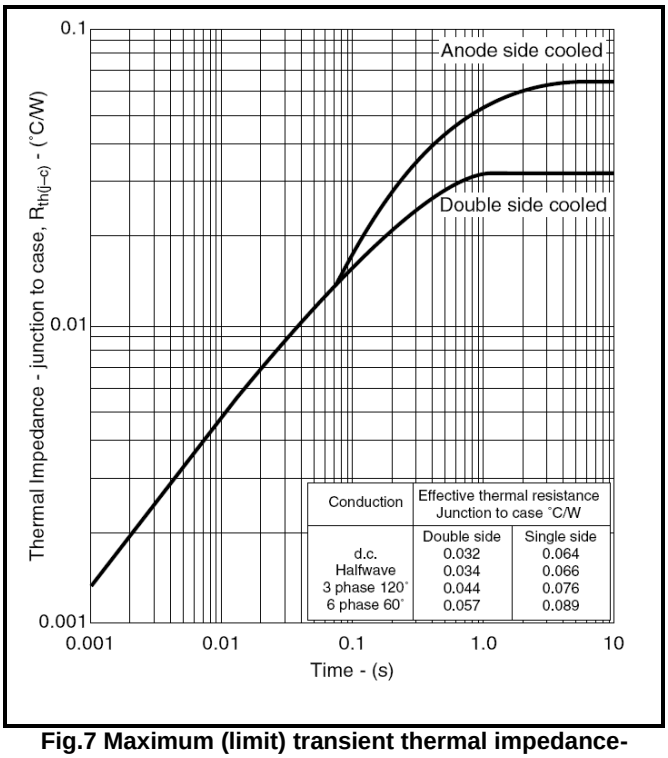
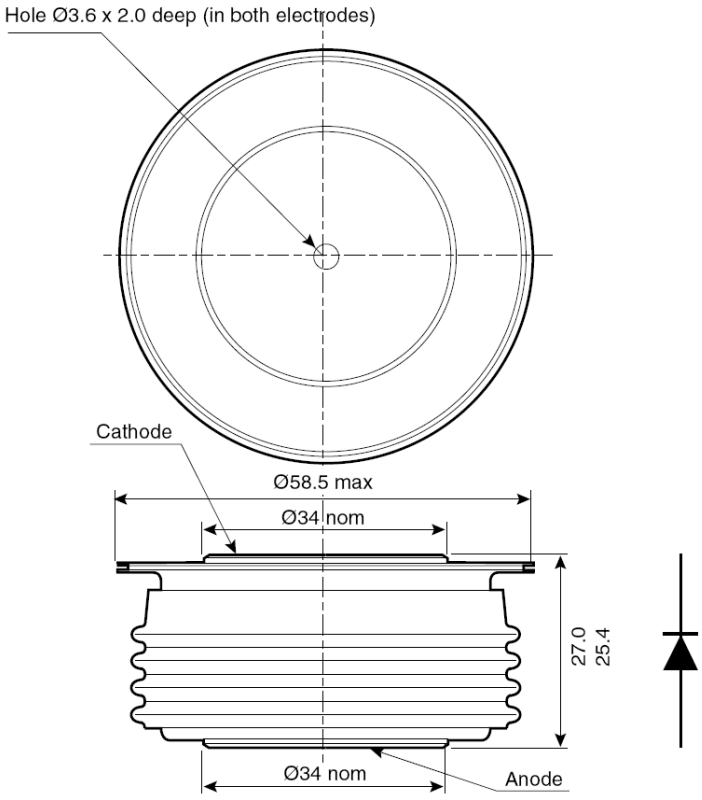


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Normal weight: 250g
Clamping force: 12kN±10%

Package outline type code:G

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

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