DRD1010F60

Rectifier Diode

DS5984-2 June 13 (LN30615)

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

- Rectification
- Free-wheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

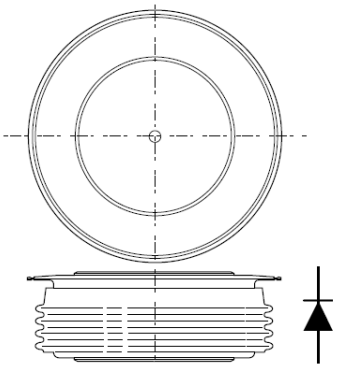
KEY PARAMETERS

V_{RRM}	**6000V**
$I_{F(AV)}$	**1015A**
I_{FSM}	**16500A**

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{RRM} V	Conditions
DRD1010F60	6000	$V_{RSM} = V_{RRM}+100V$
DRD1010F59	5900	
DRD1010F58	5800	
DRD1010F57	5700	
DRD1010F56	5600	
DRD1010F55	5500	

Lower voltage grades available.



Outline type code: F

(See Package Details for further information)

Fig. 1 Package outlines

ORDERING INFORMATION

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

DRD1010F59

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

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	1320	A
$I_{F(RMS)}$	RMS value	-	2073	A
I_F	Continuous (direct) on-state current	-	1897	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	947	A
$I_{F(RMS)}$	RMS value	-	1487	A
I_F	Continuous (direct) on-state current	-	1283	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	1015	A
$I_{F(RMS)}$	RMS value	-	1594	A
I_F	Continuous (direct) on-state current	-	1480	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	680	A
$I_{F(RMS)}$	RMS value	-	1067	A
I_F	Continuous (direct) on-state current	-	920	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	13.5	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	0.92	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	16.5	kA
I^2t	I^2t for fusing	V_R = 0	1.425	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	-	0.022	°C/W
		Single side cooled	Anode DC	-	0.038	°C/W
			Cathode DC	-	0.052	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 19.5kN	Double side	-	0.004	°C/W
		(with mounting compound)	Single side	-	0.008	°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			18.0	22.0	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 3400A peak, T_{case} = 25℃	-	2.1	V
I_{RM}	Peak reverse current	At V_{DRM}, T_{case} = 150℃	-	75	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs	-	4500	µC
I_{rr}	Peak reverse recovery current	T_{case} = 150℃, V_R =100V	-	120	A
V_{TO}	Threshold voltage	At T_{vj} = 150℃	-	1.0	V
r_T	Slope resistance	At T_{vj} = 150℃	-	0.42	mΩ

CURVES

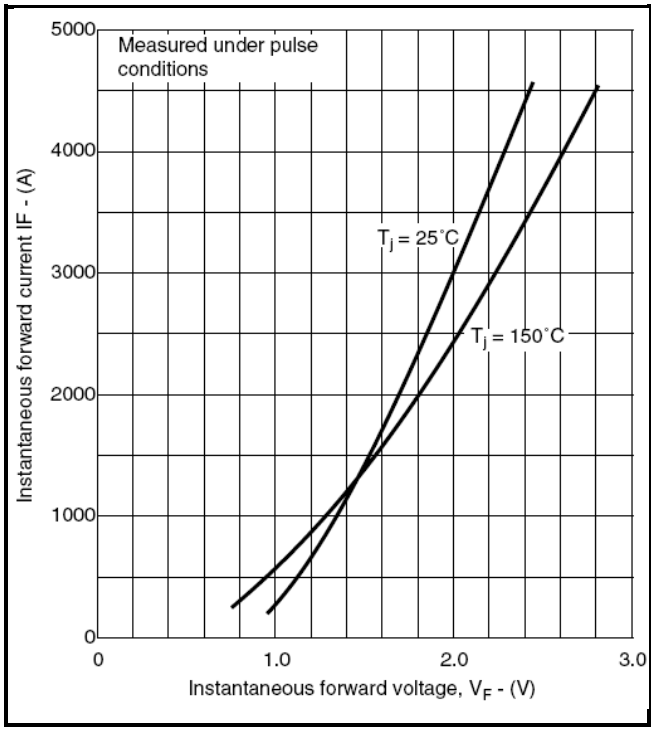


Fig.2 Maximum (limit) on-state characteristics

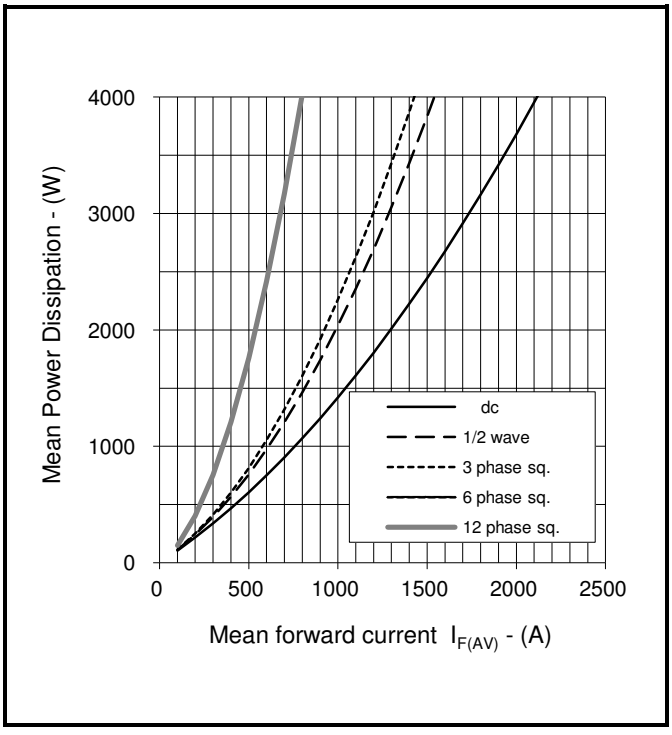


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.819645
B = -0.13673
C = 5.73×10^{-5}
D = 0.042435

these values are valid for T_j = 150 ℃ for I_F 500A to 5000A

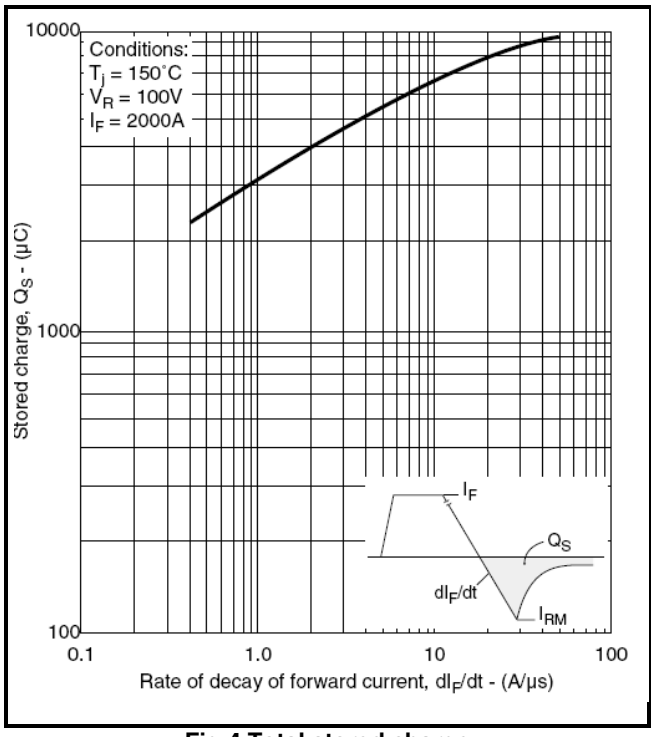


Fig.4 Total stored charge

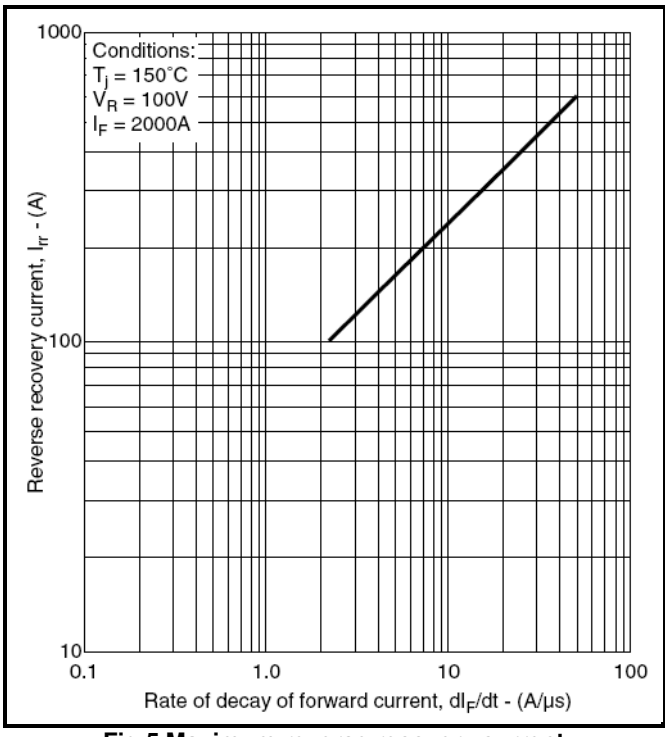


Fig.5 Maximum reverse recovery current

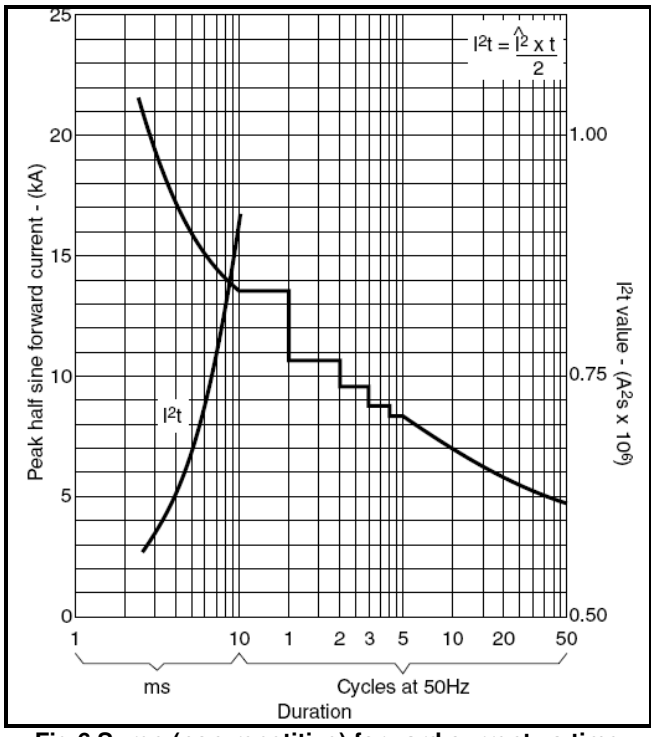
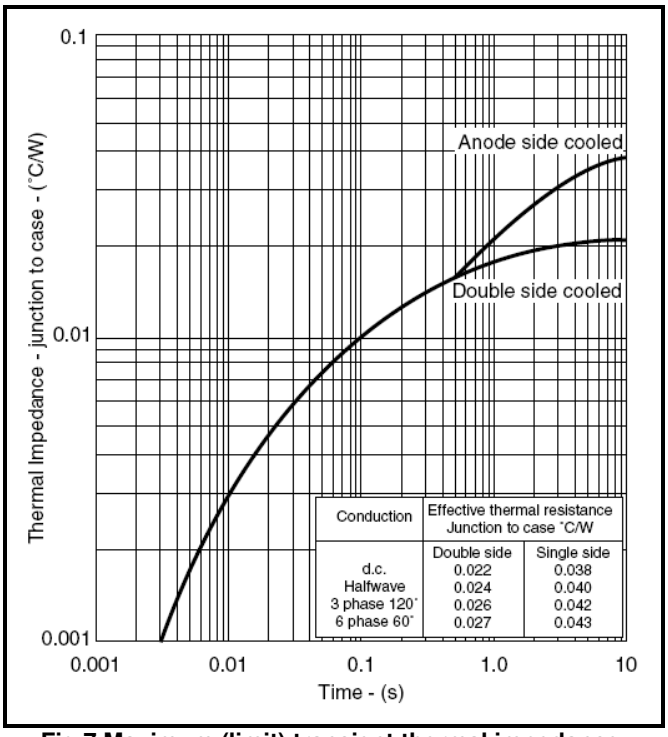


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150°C)

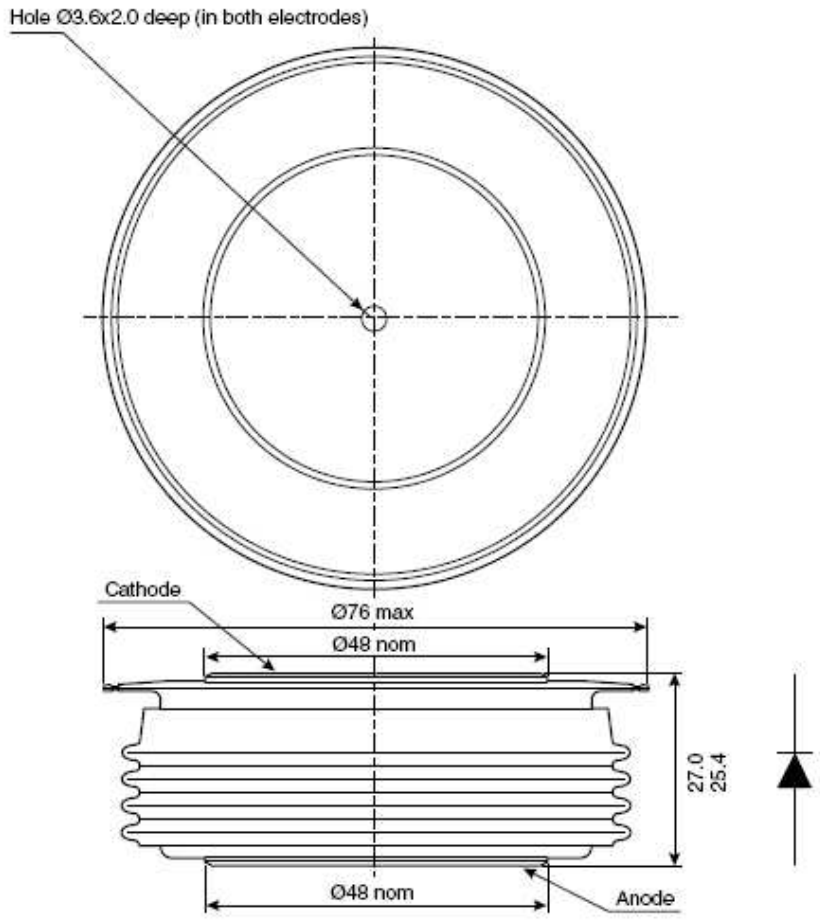


Conduction	Effective thermal resistance Junction to case °C/W	
	Double side	Single side
d.c.	0.022	0.038
Halfwave	0.024	0.040
3 phase 120°	0.026	0.042
6 phase 60°	0.027	0.043

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: 450g

Pakage outline type code:F

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

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