DRD1100F48

Rectifier Diode

DS5981-1 January 2011 (LN28002)

FEATURES

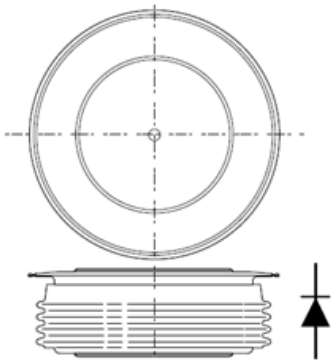
- Double Side Cooling
- High Surge Capability

KEY PARAMETERS

V_{RRM}	**4800V**
$I_{F(AV)}$	**1105A**
I_{FSM}	**20500A**

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{RRM} V	Conditions
DRD1100F48 DRD1100F46 DRD1100F44 DRD1100F40	4800 4600 4400 4000	$V_{RSM} = V_{RRM}+100V$



Outline type code: F

(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:

DRD1100F46 for a 4600V 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	1428	A
$I_{F(RMS)}$	RMS value	-	2242	A
I_F	Continuous (direct) on-state current	-	2082	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	1033	A
$I_{F(RMS)}$	RMS value	-	1622	A
I_F	Continuous (direct) on-state current	-	1424	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	1105	A
$I_{F(RMS)}$	RMS value	-	1735	A
I_F	Continuous (direct) on-state current	-	1580	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	730	A
$I_{F(RMS)}$	RMS value	-	1145	A
I_F	Continuous (direct) on-state current	-	960	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
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 = 50% V_{RRM} - ¼ sine	1.35	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	20.5	kA
I^2t	I^2t for fusing	V_R = 0	2.125	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	-	0.022	°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	22	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 3400A peak, T_{case} = 25°C	-	1.8	V
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	75	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs	-	4000	µC
I_{rr}	Peak reverse recovery current	T_{case} = 150°C, V_R =100V	-	115	A
V_{TO}	Threshold voltage	At T_{vj} = 150°C	-	0.84	V
r_T	Slope resistance	At T_{vj} = 150°C	-	0.383	mΩ

CURVES

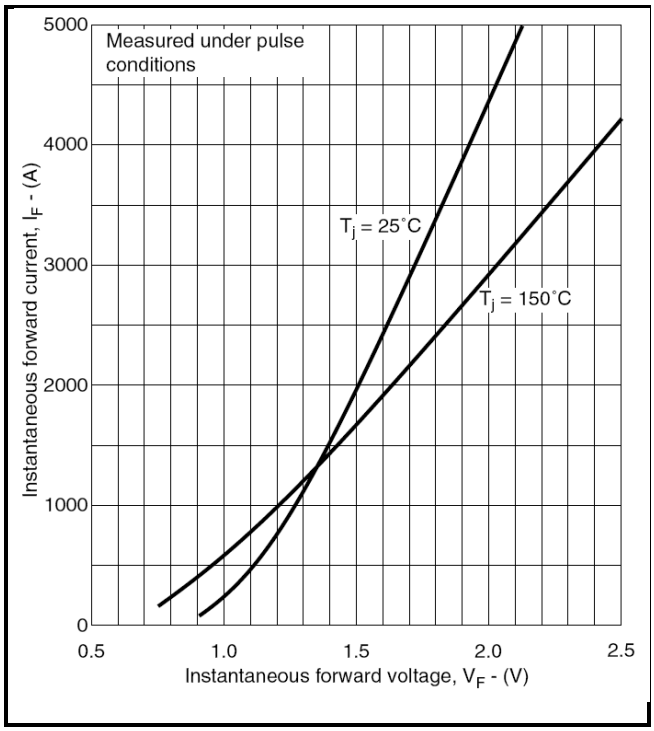


Fig.2 Maximum & minimum on-state characteristics

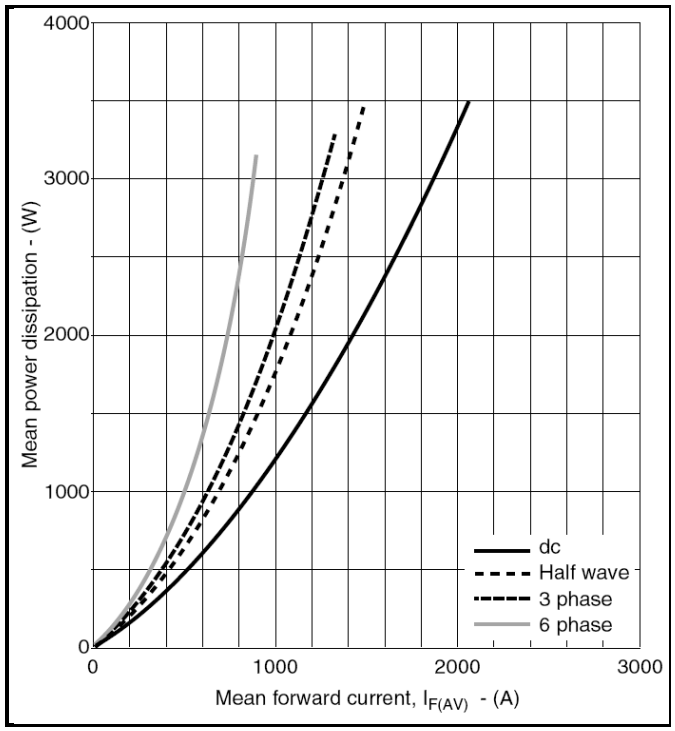


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.290476
B = 0.06449
C = 0.000335
D = 0.00408

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

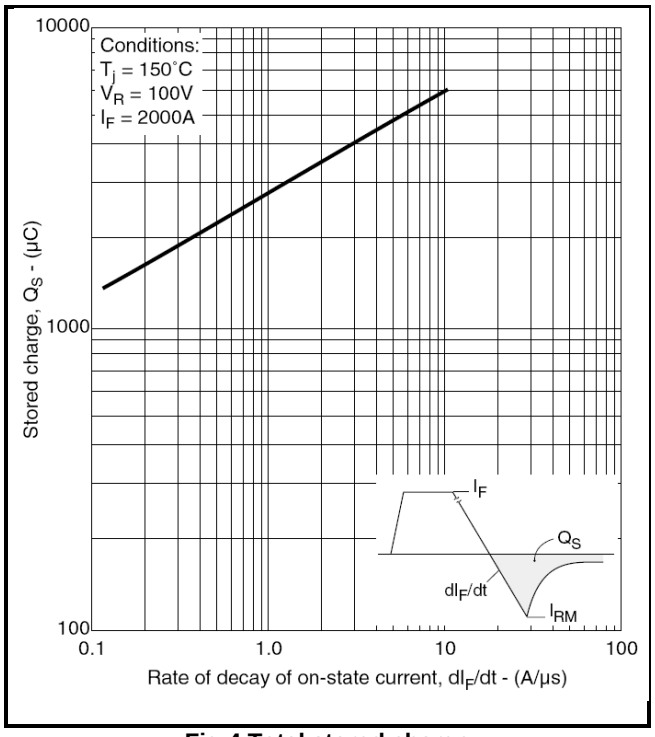


Fig.4 Total stored charge

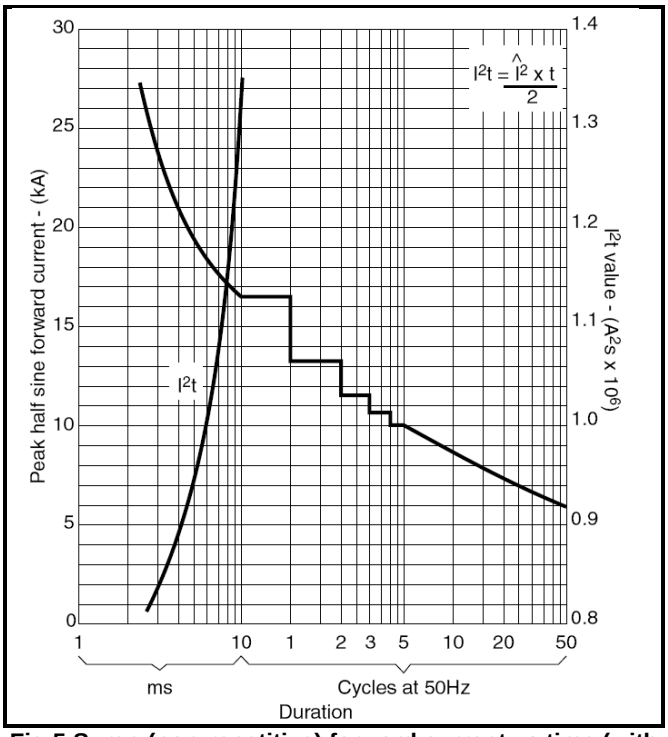


Fig.5 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150°C)

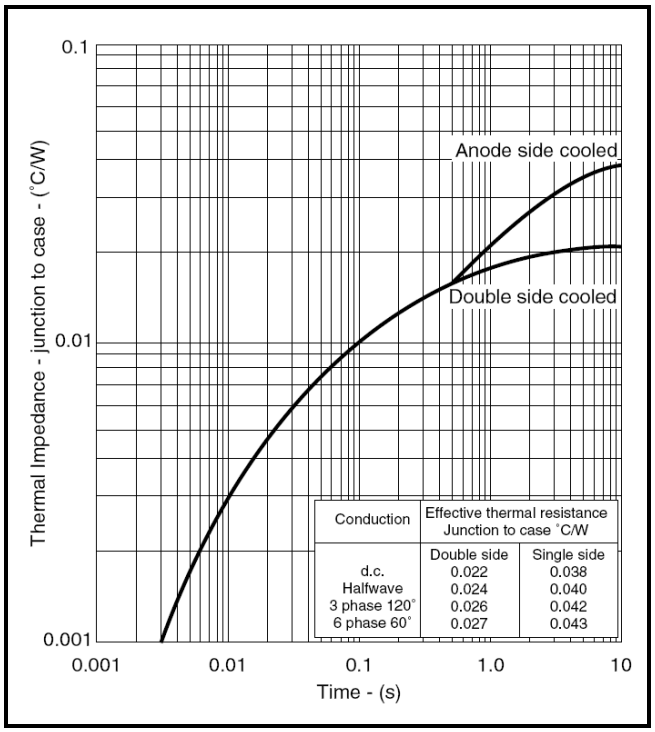
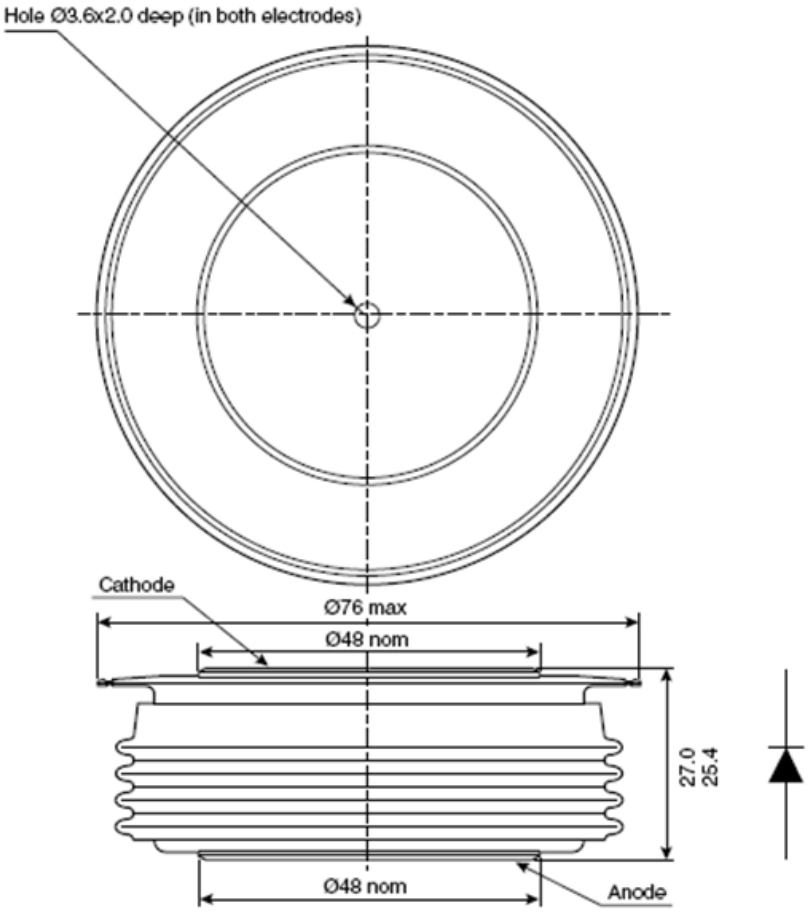


Fig.6 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Normal weight: 450g
Clamping force: 19.5kN±10%

Package outline type code:F

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

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