

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

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

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.

KEY PARAMETERS

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

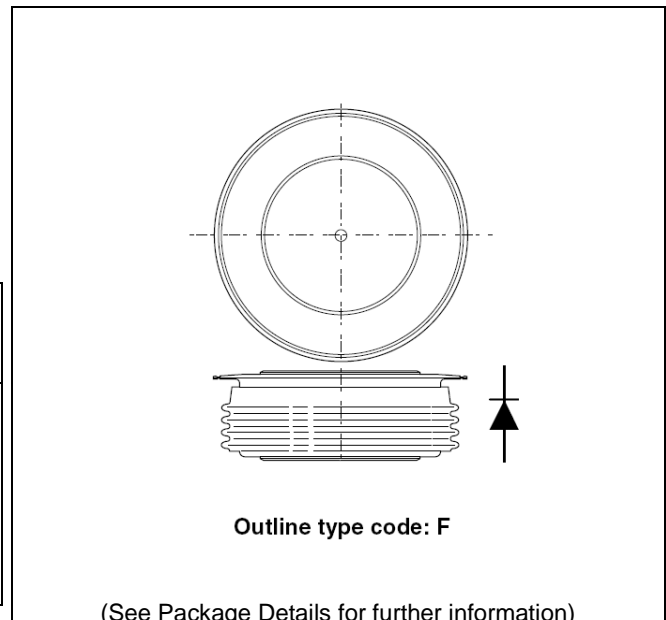


Fig. 1 Package outlines

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, $T_{case} = 150^{\circ}C$ $V_R = 50\% V_{RRM} - 1/4$ sine	13.5	kA
I^2t	I^2t for fusing		0.92	MA ² s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 0$	16.5	kA
I^2t	I^2t for fusing		1.425	MA ² 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	-	0.022	$^{\circ}C/W$
		Single side cooled	Anode DC	-	0.038	$^{\circ}C/W$
			Cathode DC	-	0.052	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 19.5kN (with mounting compound)	Double side	-	0.004	$^{\circ}C/W$
			Single side	-	0.008	$^{\circ}C/W$
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			18.0	22.0	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V _{FM}	Forward voltage	At 3400A peak, T _{case} = 25°C	-	2.1	V
I _{RM}	Peak reverse current	At V _{DRM} , T _{case} = 150°C	-	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°C, V _R = 100V	-	120	A
V _{TO}	Threshold voltage	At T _{vj} = 150°C	-	1.0	V
r _T	Slope resistance	At T _{vj} = 150°C	-	0.42	mΩ

CURVES

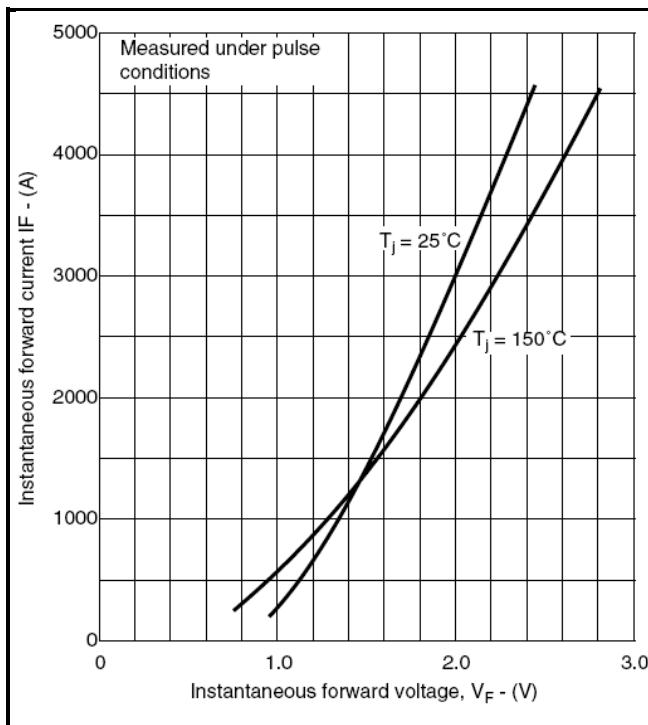


Fig.2 Maximum (limit) on-state characteristics

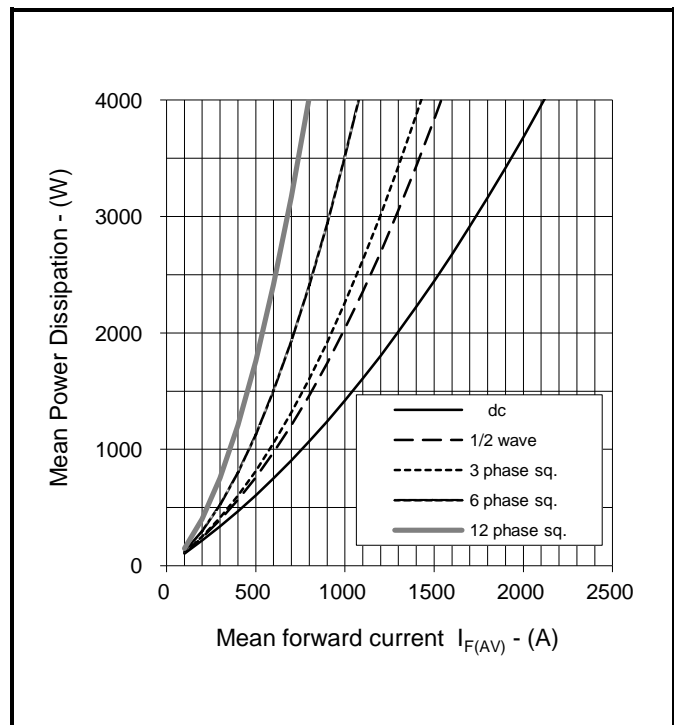


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.819645
 B = -0.13673
 C = 5.73x10⁻⁵
 D = 0.042435

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

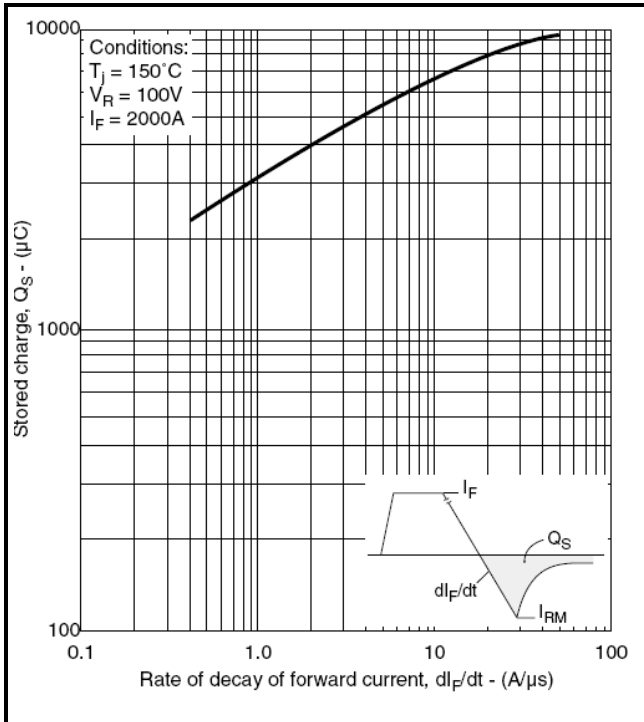


Fig.4 Total stored charge

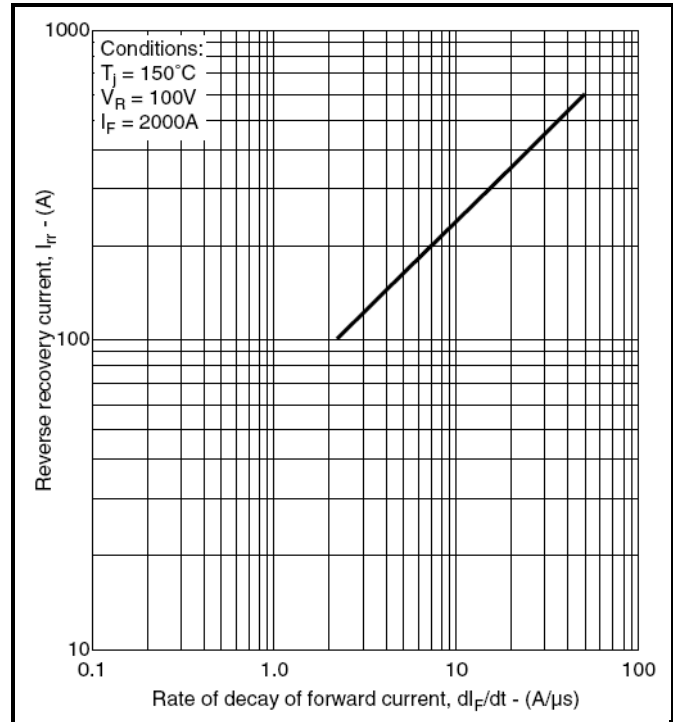


Fig.5 Maximum reverse recovery current

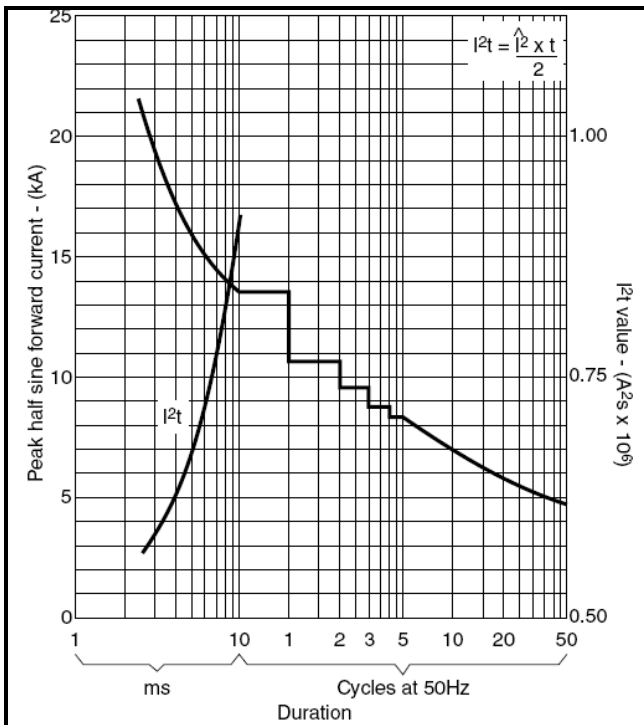


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at $T_{case} 150^\circ\text{C}$)

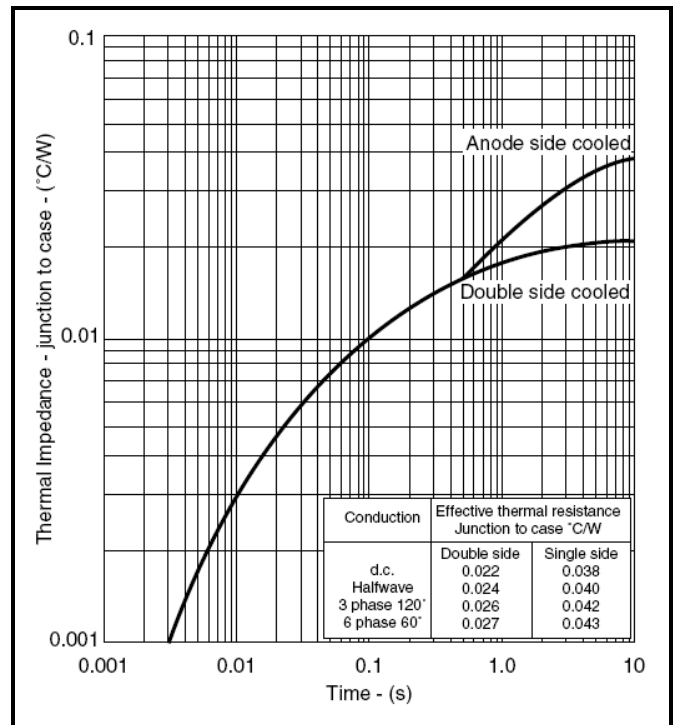
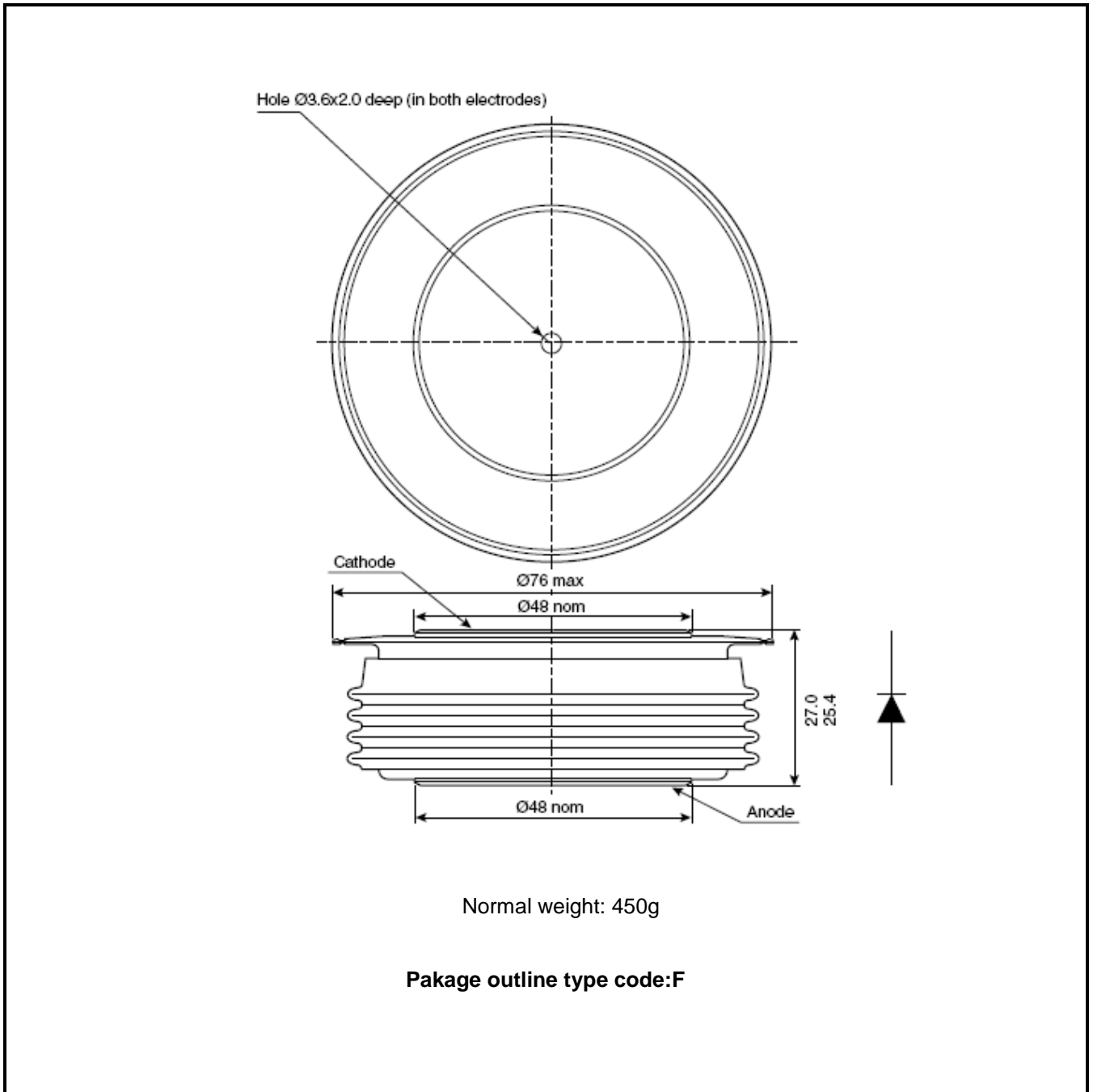


Fig.7 Maximum (limit) transient thermal impedance-junction to case

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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