

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
DRD3390V40	4000	$V_{RSM} = V_{RRM} + 100V$
DRD3390V39	3900	
DRD3390V38	3800	
DRD3390V37	3700	
DRD3390V36	3600	
DRD3390V35	3500	

Lower voltage grades available.

ORDERING INFORMATION

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

For example:

DRD3390V37 for a 3700V device

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

KEY PARAMETERS

V_{RRM}	4000V
$I_{F(AV)}$	3388A
I_{FSM}	62500A

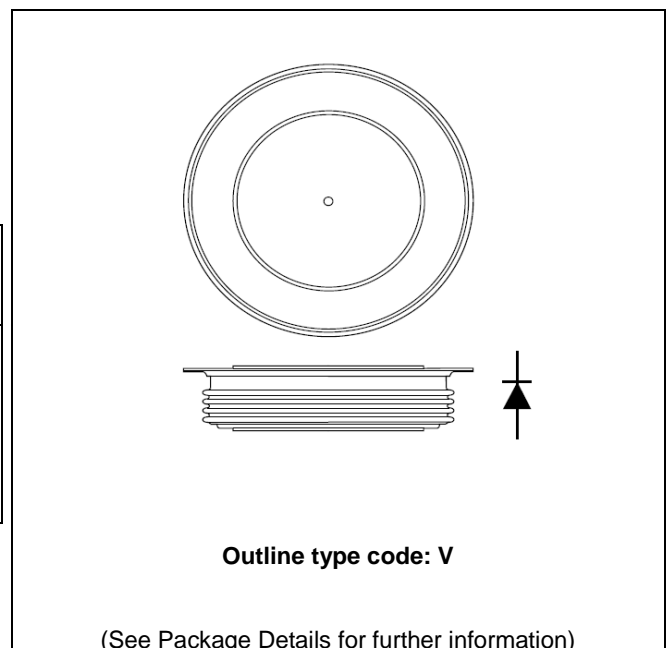


Fig. 1 Package outlines

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	4366	A
I _{F(RMS)}	RMS value	-	6858	A
I _F	Continuous (direct) on-state current	-	6561	A
Single Side Cooled (Anode side)				
I _{F(AV)}	Mean forward current	Half wave resistive load	2926	A
I _{F(RMS)}	RMS value	-	4596	A
I _F	Continuous (direct) on-state current	-	4066	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	3388	A
I _{F(RMS)}	RMS value	-	5321	A
I _F	Continuous (direct) on-state current	-	4983	A
Single Side Cooled (Anode side)				
I _{F(AV)}	Mean forward current	Half wave resistive load	2232	A
I _{F(RMS)}	RMS value	-	3506	A
I _F	Continuous (direct) on-state current	-	3015	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	50.0	kA
I^2t	I^2t for fusing		12.5	MA ² s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 0$	62.5	kA
I^2t	I^2t for fusing		19.6	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	-	0.0075	$^{\circ}C/W$
		Single side cooled	Anode DC	-	0.015	$^{\circ}C/W$
			Cathode DC	-	0.015	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 43kN (with mounting compound)	Double side	-	0.002	$^{\circ}C/W$
			Single side	-	0.004	$^{\circ}C/W$
T_{vj}	Virtual junction temperature	On-state (conducting)		-	160	$^{\circ}C$
		Reverse (blocking)		-	150	$^{\circ}C$
T_{stg}	Storage temperature range			-55	150	$^{\circ}C$
F_m	Clamping force			38.0	47.0	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V _{FM}	Forward voltage	At 3000A peak, T _{case} = 25°C	-	1.15	V
I _{RM}	Peak reverse current	At V _{DRM} , T _{case} = 150°C	-	250	mA
Q _S	Total stored charge	I _F = 2000A, dI _{RR} /dt = 3A/μs	-	5000	μC
I _{rr}	Peak reverse recovery current	T _{case} = 150°C, V _R = 100V	-	150	A
V _{TO}	Threshold voltage	At T _{vj} = 150°C	-	0.75	V
r _T	Slope resistance	At T _{vj} = 150°C	-	0.118	mΩ

CURVES

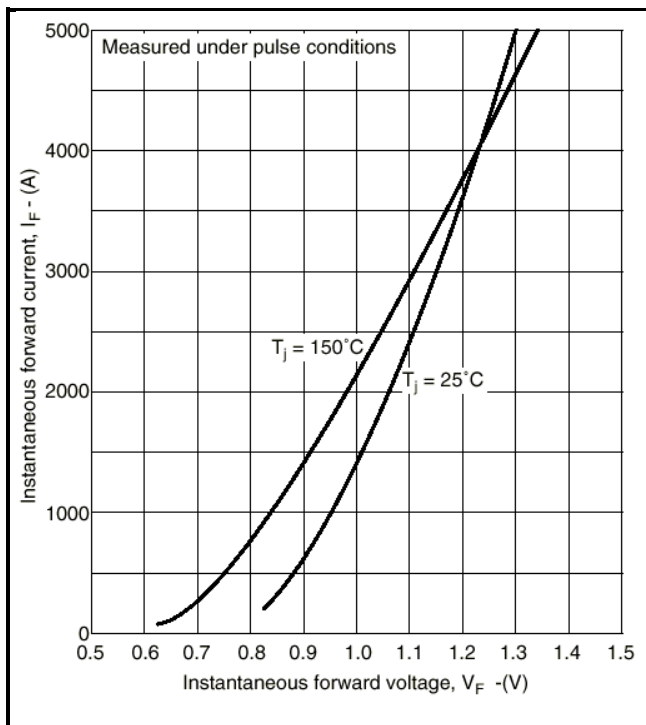


Fig.2 Maximum (limit) on-state characteristics

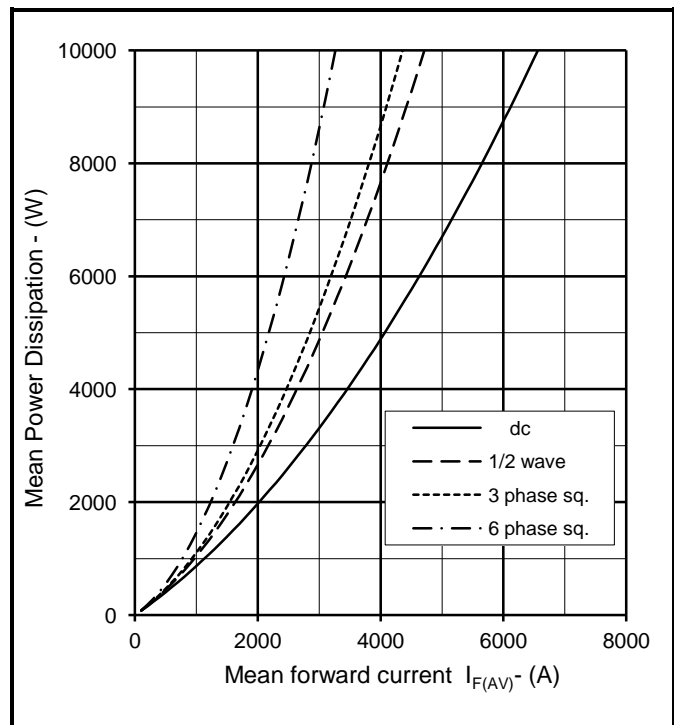


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = - 0.15357
 B = 0.177571
 C = 0.000179
 D = - 0.01294

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

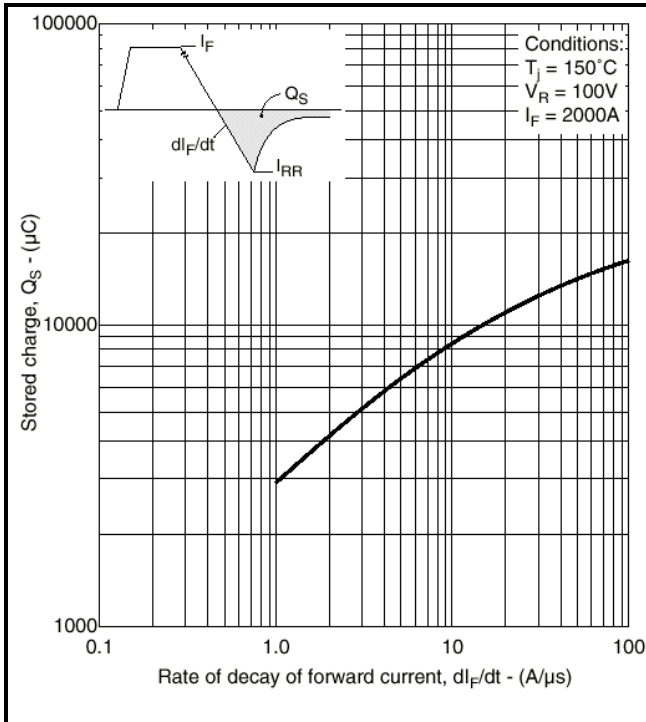


Fig.4 Total stored charge

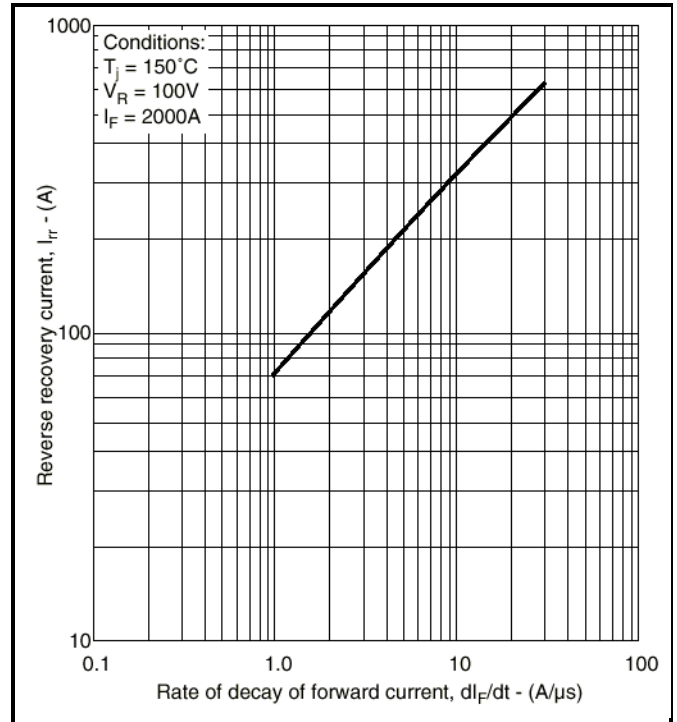


Fig.5 Maximum reverse recovery current

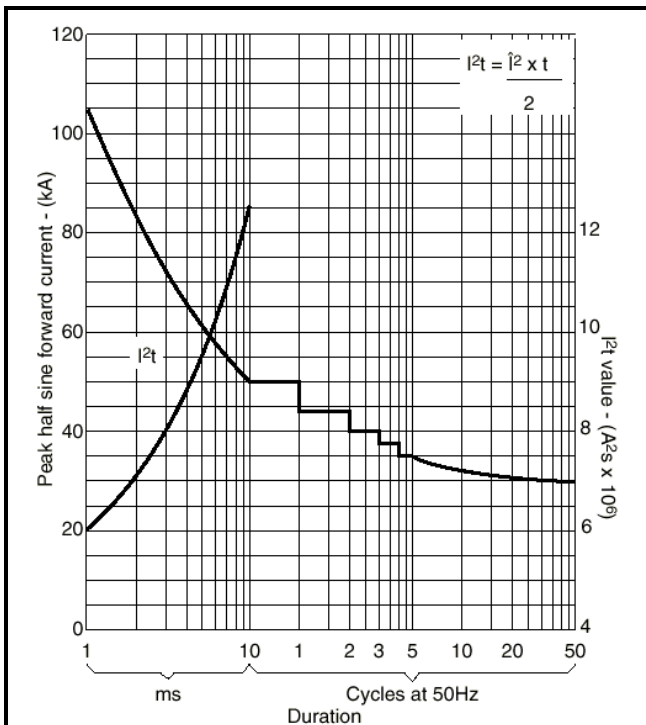


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at $T_{case} 150^\circ\text{C}$)

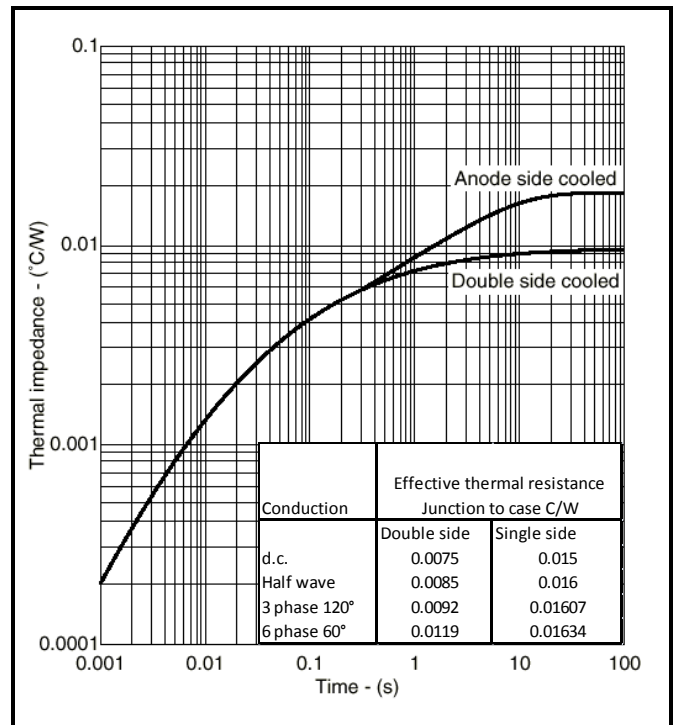
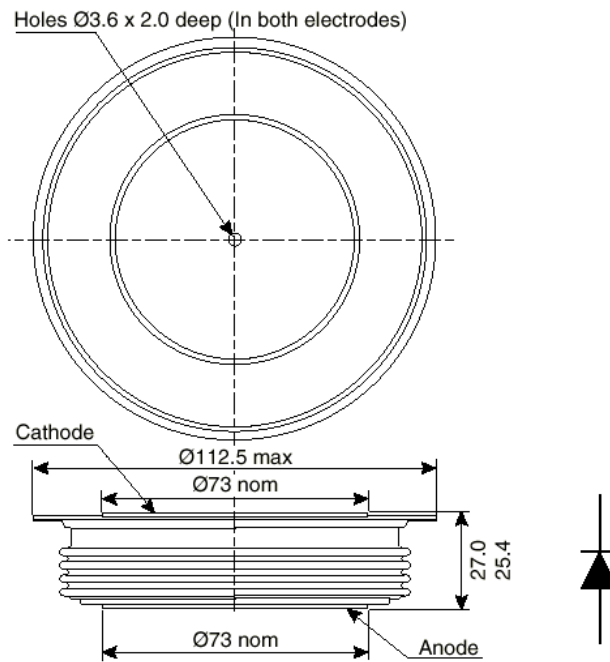


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Outline type code: V

Nominal weight: 1100g
Clamping force: 43kN \pm 10%

Note:

Some packages may be supplied with gate and or tags.

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Target Information:	This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.
Preliminary Information:	The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change.
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