RD65FY

Rectifier Diode

DS5896-1.0 October 2006 (LN22831)

KEY PARAMETERS

V_{RRM}	**600V**
$I_{F(AV)}$	**10205A**
I_{FSM}	**62500A**

FEATURES

- Optimised For High Current Rectifiers
- High Surge Capability
- Very Low On-State Voltage

APPLICATIONS

- Electroplating
- Power Supplies
- Welding

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{DRM} and V_{DRM} V	Conditions
RD65FY06 RD65FY04 RD65FY02	600 400 200	$V_{RSM} = V_{RRM}+100V$

Lower voltage grades available.

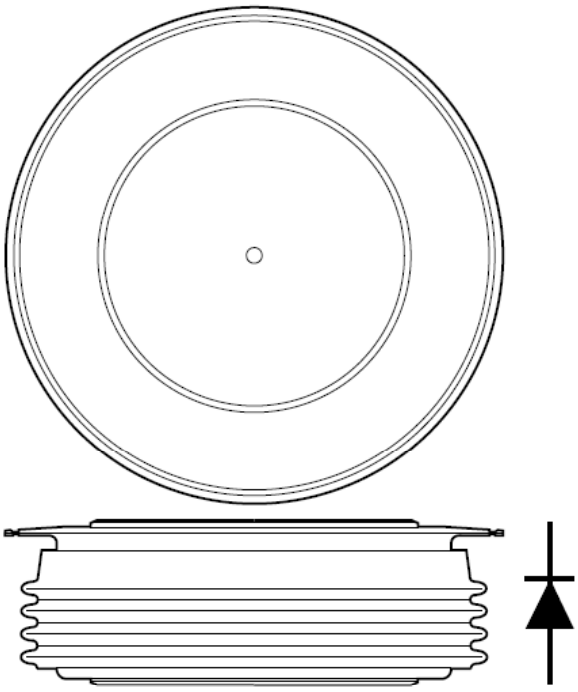
ORDERING INFORMATION

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

For example:

RD65FY04 for a 400V device in a Y outline

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



Outline type code: Y

(See Package Details for further information)

Fig. 1 Package outlines

CURRENT RATINGS

T_{case} = 75℃ unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	10205	A
$I_{F(RMS)}$	RMS value	-	16030	A
I_F	Continuous (direct) on-state current	-	14281	A
Double Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	6503	A
$I_{F(RMS)}$	RMS value	-	10215	A
I_F	Continuous (direct) on-state current	-	8350	A

T_{case} = 100℃ unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	8765	A
$I_{F(RMS)}$	RMS value	-	13768	A
I_F	Continuous (direct) on-state current	-	12076	A
Double Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	5517	A
$I_{F(RMS)}$	RMS value	-	8666	A
I_F	Continuous (direct) on-state current	-	6957	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 175℃	130	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	84.5	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 175℃	162	kA
I^2t	I^2t for fusing	V_R = 0	132	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	-	0.0095	℃/W
		Single side cooled	Anode DC	-	0.019	℃/W
			Cathode DC	-	0.019	℃/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 43kN	Double side	-	0.002	℃/W
		(with mounting compound)	Single side	-	0.004	℃/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	225	℃
		Reverse (blocking)		-	200	℃
T_{stg}	Storage temperature range			-55	200	℃
F_m	Clamping force			38.0	47.0	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
I_{RM}	Peak reverse current	At V_{DRM}, T_{case} = 20℃	-	10	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs	-	230	µC
I_{rr}	Peak reverse recovery current	T_{case} = 200℃, V_R =100V	-	39	A
V_{TO}	Threshold voltage	At T_{vj} = 200℃	-	0.6	V
r_T	Slope resistance	At T_{vj} = 200℃	-	0.0225	mΩ

CURVES

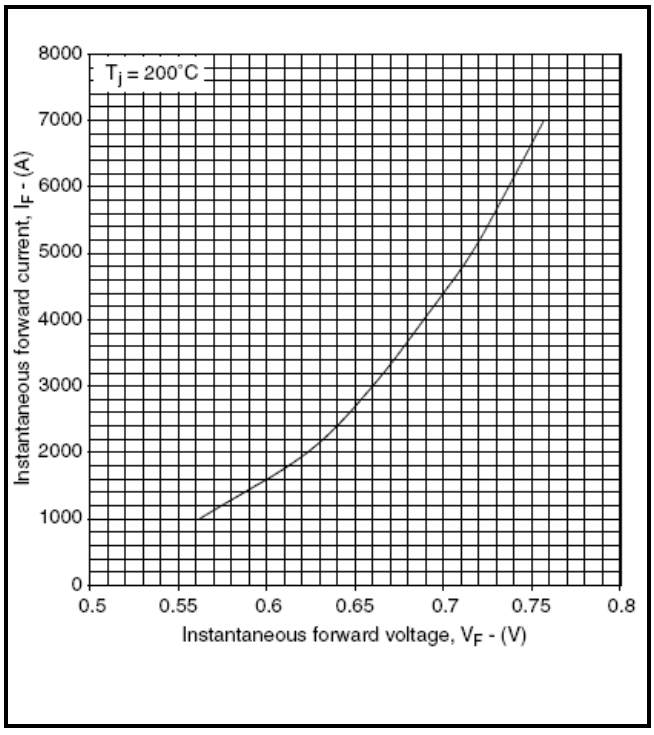


Fig.2 Maximum & minimum on-state characteristics

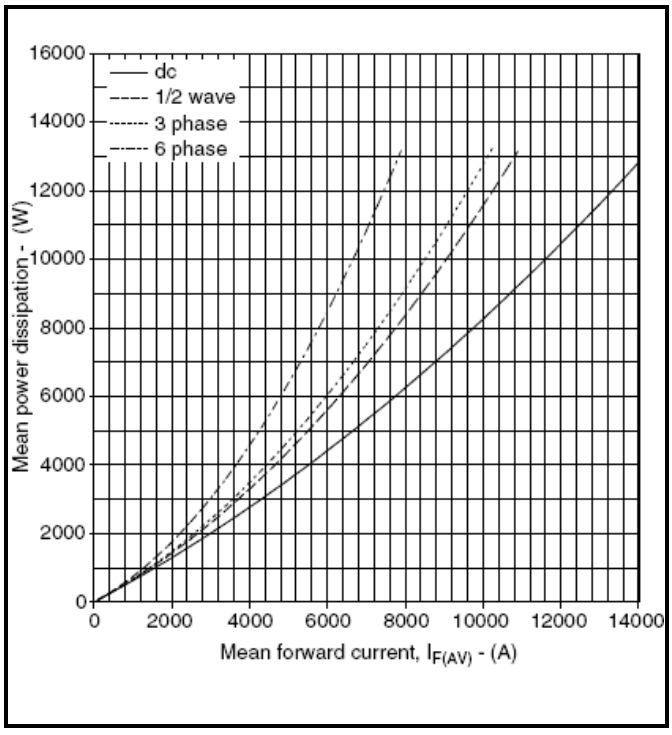


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = - 0.025942
B = 0.079928
C = 0.000014
D = - 0.000899

these values are valid for T_j = 200℃ for I_F 100A to 10000A

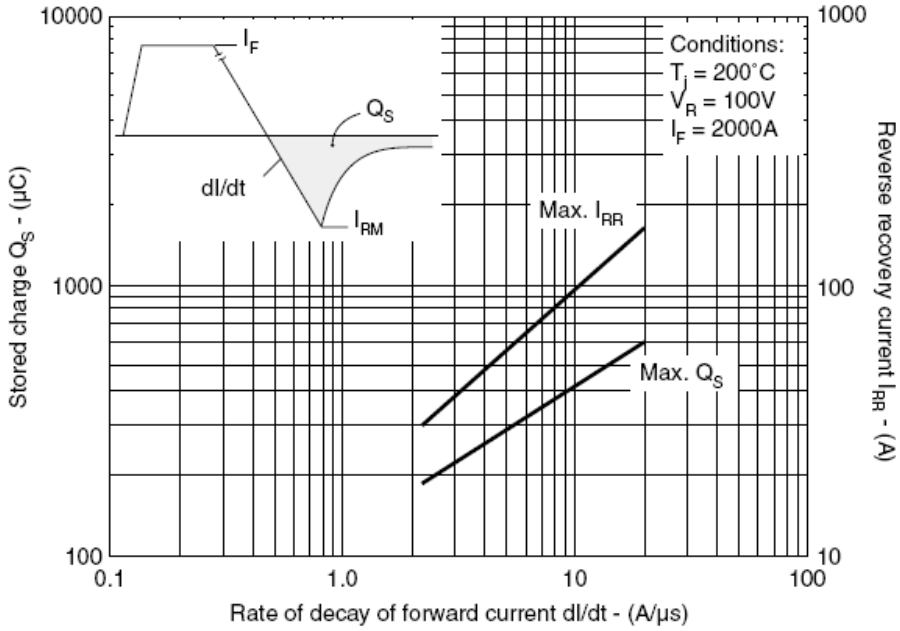


Fig.4 Maximum stored charge and reverse recovery current vs dI/dt

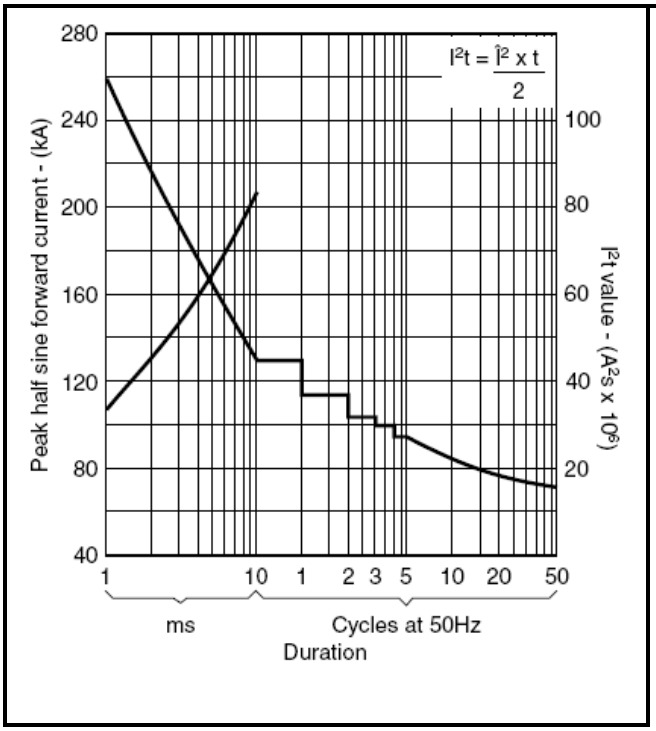


Fig.5 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150℃)

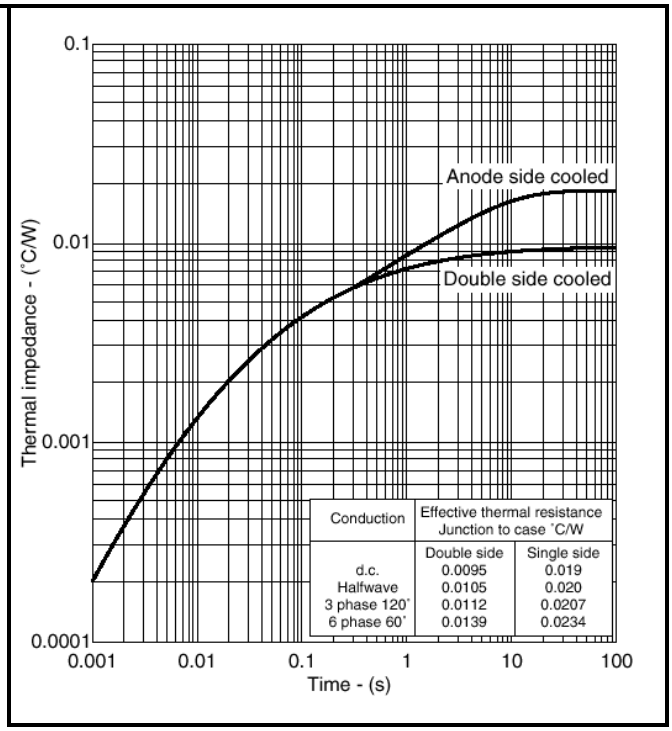
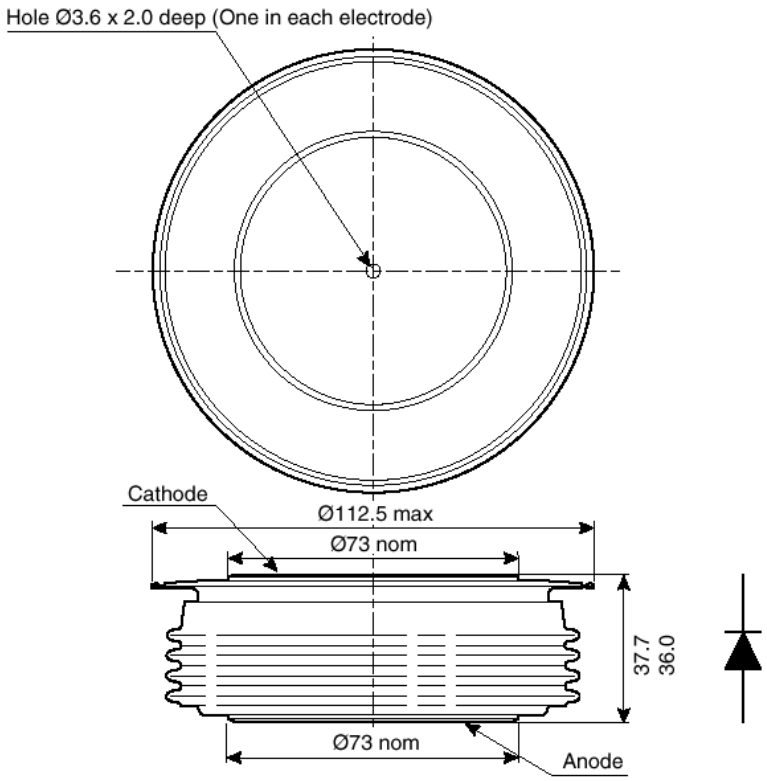


Fig.6 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Normal weight: 1600g
Clamping force: 43kN±10%

Pakage outline type code:Y

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

POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group offers high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks which have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or Customer Services.

Stresses above those listed in this data sheet may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed.

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