RD65FV

Rectifier Diode

Target Information

Replaces November 2000, version DS5408-1.1

DS5408-2.0 October 2001

FEATURES

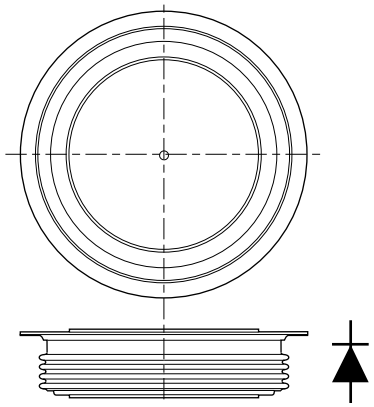
- Optimised For High Current Rectifiers
- High Surge Capability
- Very Low On-state Voltage

APPLICATIONS

- Electroplating
- Power Supplies
- Welding

KEY PARAMETERS

V_{RRM}		**600V**
$I_{F(AV)}$	**(max)**	**11745A**
I_{FSM}	**(max)**	**162000A**



Outline type code: V

(See Package Details for further information)

Fig. 1 Package outline

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
RD65FV06	600	$V_{RSM} = V_{RRM}$
RD65FV05	500	
RD65FV04	400	
RD65FV03	300	
RD65FV02	200	
RD65FV01	100	

ORDERING INFORMATION

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

For example:

RD65FV04

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

CURRENT RATINGS

T_{case} = 75ºC unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	11745	A
$I_{F(RMS)}$	RMS value	-	18450	A
I_F	Continuous (direct) forward current	-	16974	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	7632	A
$I_{F(RMS)}$	RMS value	-	11988	A
I_F	Continuous (direct) forward current	-	10079	A

T_{case} = 85ºC unless otherwise stated

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	11120	A
$I_{F(RMS)}$	RMS value	-	17500	A
I_F	Continuous (direct) forward current	-	16000	A
Single Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	7200	A
$I_{F(RMS)}$	RMS value	-	11300	A
I_F	Continuous (direct) forward current	-	9450	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine, T_{case} = 175˚C	130	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - 1/4 sine	84.5 x 10^6	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine, T_{case} = 175˚C	162	kA
I^2t	I^2t for fusing	V_R = 0	132 x 10^6	A^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	-	0.0075	˚CW
		Single side cooled	Anode DC	-	0.015	˚CW
			Cathode DC	-	0.015	˚CW
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 43.0kN	Double side	-	0.002	˚CW
		(with mounting compound)	Single side	-	0.004	˚CW
T_{vj}	Virtual junction temperature	Forward (conducting)		-	225	˚C
		Reverse (blocking)		-	200	˚C
T_{stg}	Storage temperature range			–55	200	˚C
F_m	Clamping force			38.7	47.3	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 200˚C	-	150	mA
I_{rr}	Peak reverse recovery current	I_F = 2000A, dI_{RR}/dt = 3A/µs,	-	230	A
Q_S	Total stored charge	T_{case} = 200˚C, V_R = 100V	-	39	µC
V_{TO}	Threshold voltage	At T_{vj} = 200˚C	-	0.6	V
r_T	Slope resistance	At T_{vj} = 200˚C	-	0.0225	mΩ

CURVES

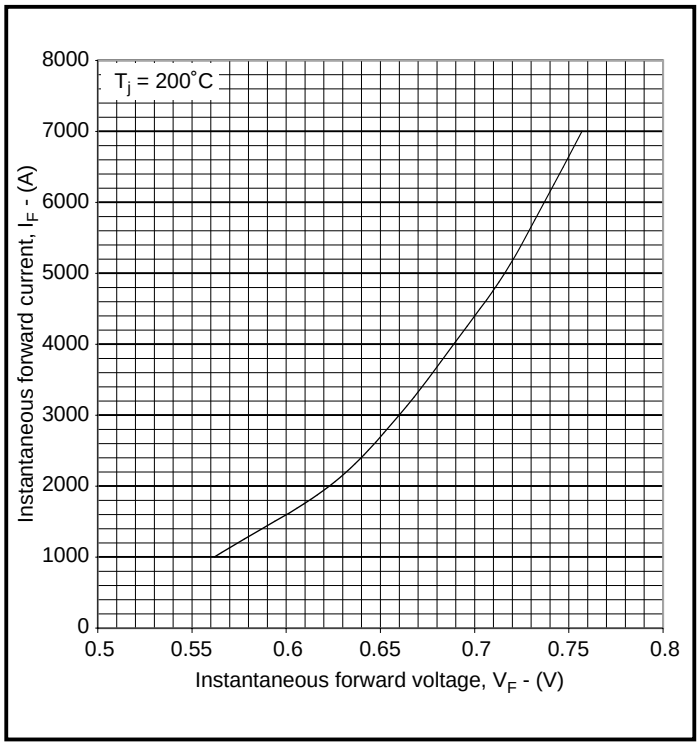


Fig. 2 Maximum (limit) forward characteristics

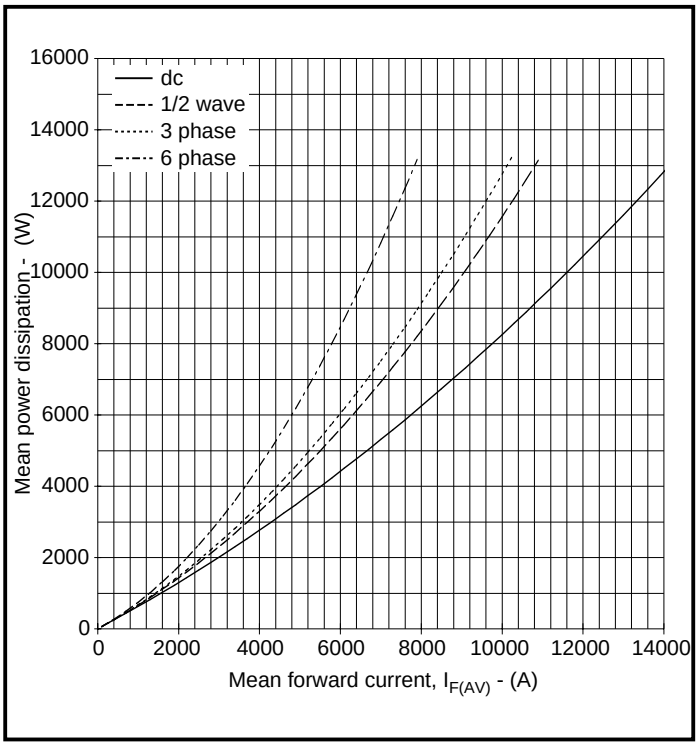


Fig. 3 Power dissipation

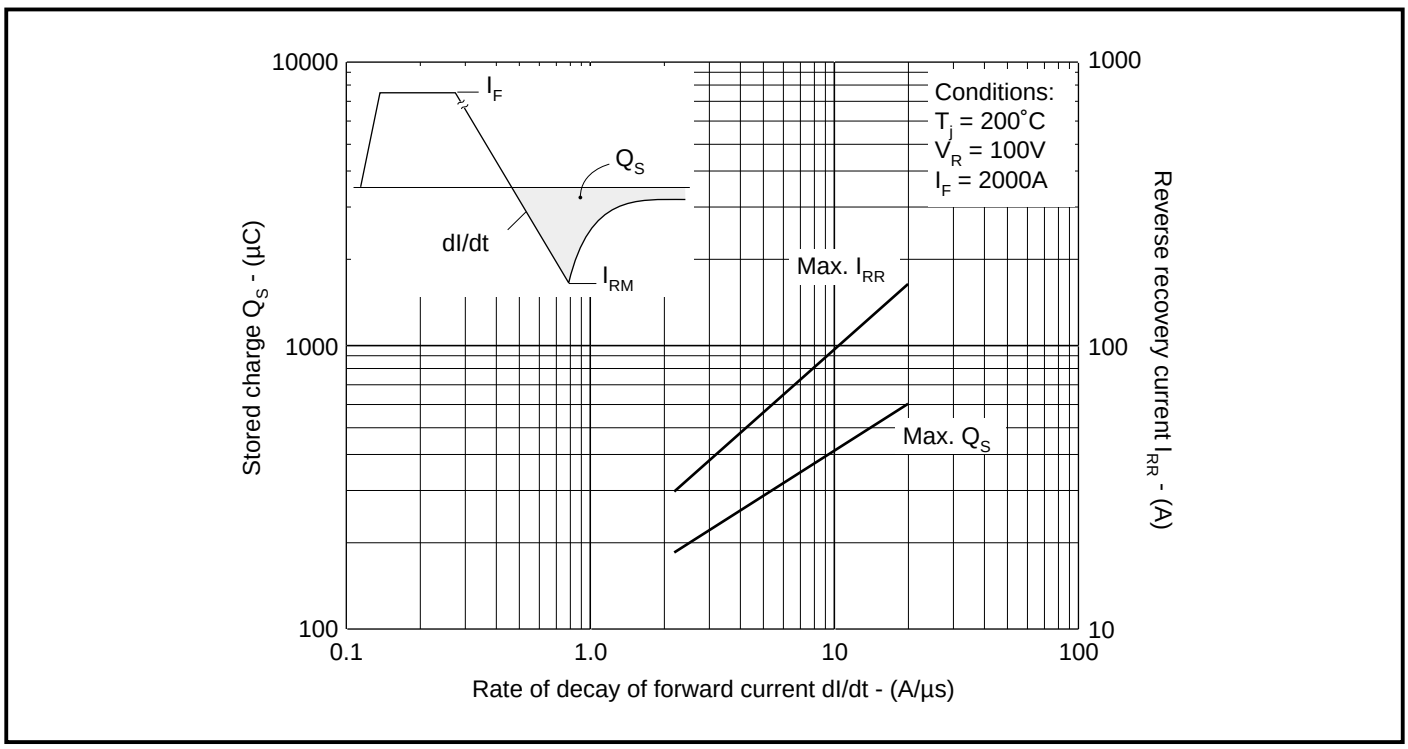


Fig. 4 Maximum stored charge and reverse recovery current vs dI/dt

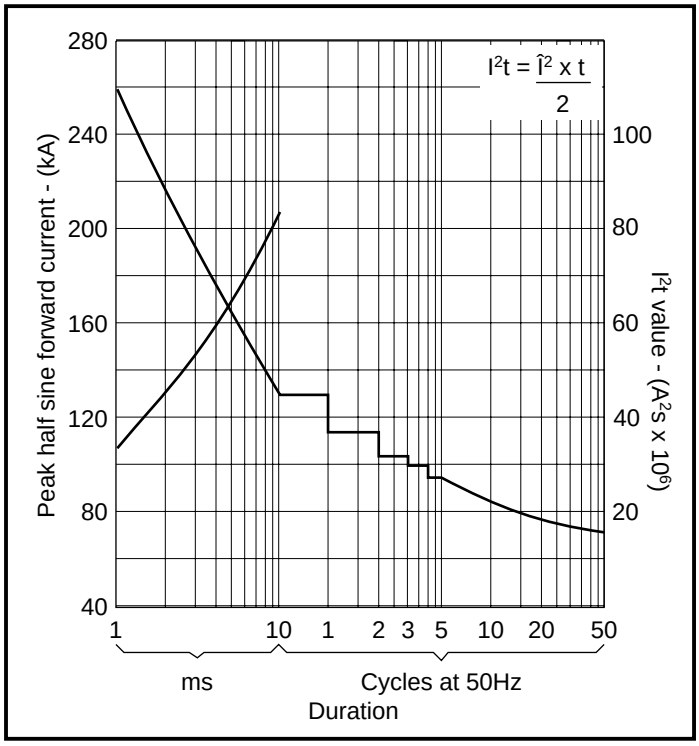
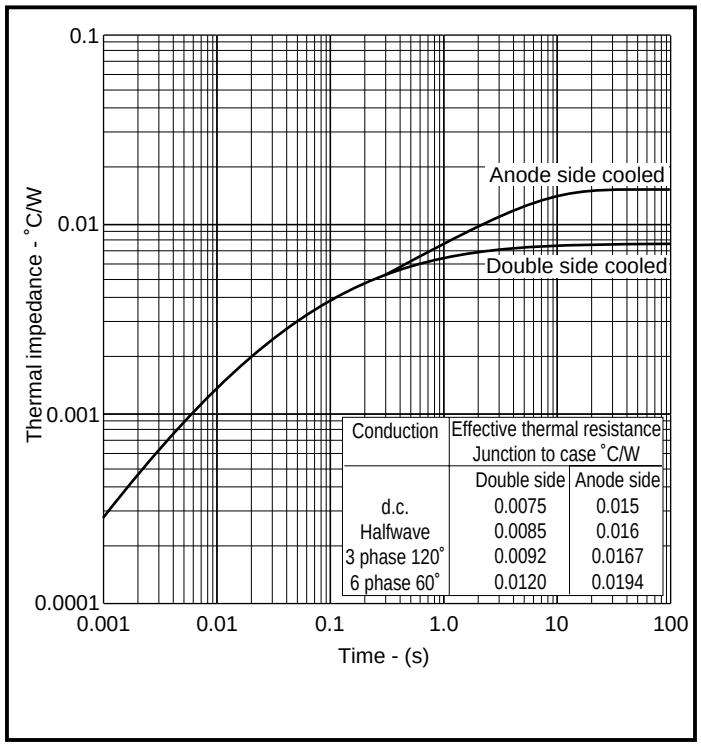


Fig. 5 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} @ T_{case} = 175˚C)

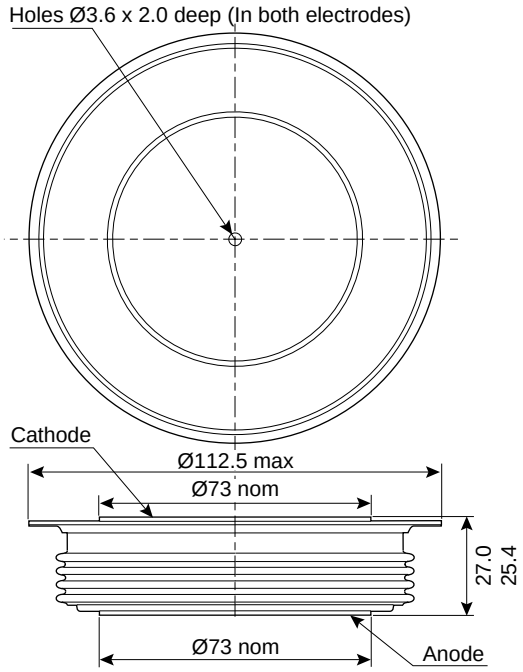


Conduction	Effective thermal resistance Junction to case ˚C/W	
	Double side	Anode side
d.c.	0.0075	0.015
Halfwave	0.0085	0.016
3 phase 120˚	0.0092	0.0167
6 phase 60˚	0.0120	0.0194

Fig. 6 Maximum (limit) transient thermal impedance

PACKAGE DETAILS

For further package information, please visit our website or contact your nearest Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Nominal weight: 1100g
Clamping force: 43kN ±10%

Package outine type code: V

Note:
1. Package maybe supplied with pins 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 / clamping systems in line with advances in device types and the voltage 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 continues to offer high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

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

DEVICE CLAMPS

Disc devices require the correct clamping force to ensure their safe operation. The PACs range offers a varied selection of pre-loaded clamps to suit all of our manufactured devices. This include cube clamps for single side cooling of 'T' 22mm

Clamps are available for single or double side cooling, with high insulation versions for high voltage assemblies.

Please refer to our application note on device clamping, AN4839

HEATSINKS

Power Assembly has its own proprietary range of extruded aluminium heatsinks. They have been designed to optimise the performance or our 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.

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Datasheet Annotations:

Dynex Semiconductor annotate datasheets in the top right hard corner of the front page, to indicate product status. The annotations are as follows:-

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 is in design and development. The datasheet represents the product as it is understood but details may change.

Advance Information: The product design is complete and final characterisation for volume production is well in hand.

No Annotation: The product parameters are fixed and the product is available to datasheet specification.