DS501ST

Rectifier Diode

Replaces October 2000, version DS5344-2.0

DS5344-3.0 October 2001

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

- Rectification
- Freewheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

KEY PARAMETERS

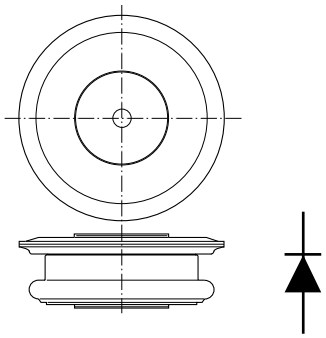
V_{RRM} **600V**

$I_{F(AV)}$ **940A**

I_{FSM} **11000A**

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DS501ST06	600	$V_{RSM} = V_{RRM} + 100V$
DS501ST05	500	
DS501ST04	400	
DS501ST03	300	
DS501ST02	200	
DS501ST01	100	



Outline type code: T.
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, e.g.:

DS501ST04

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	940	A
$I_{F(RMS)}$	RMS value	-	1477	A
I_F	Continuous (direct) forward current	-	1322	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	596	A
$I_{F(RMS)}$	RMS value	-	937	A
I_F	Continuous (direct) forward current	-	760	A

T_{case} = 100ºC unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	765	A
$I_{F(RMS)}$	RMS value	-	1205	A
I_F	Continuous (direct) forward current	-	1055	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	480	A
$I_{F(RMS)}$	RMS value	-	750	A
I_F	Continuous (direct) forward current	-	600	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_{case} = 175°C	8.8	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - 1/4 sine	387 x 10^3	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_{case} = 175°C	11.0	kA
I^2t	I^2t for fusing	V_R = 0	605 x 10^3	A^2s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.07	°C/W
		Single side cooled	Anode dc	-	0.14	°C/W
			Cathode dc	-	0.14	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 4.5kN with mounting compound	Double side	-	0.02	°C/W
			Single side	-	0.04	°C/W
T_{vj}	Virtual junction temperature	Forward (conducting)		-	185	°C
		Reverse (blocking)		-	175	°C
T_{stg}	Storage temperature range			–55	200	°C
-	Clamping force			4.0	5.0	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 175°C	-	30	mA
V_{TO}	Threshold voltage	At T_{vj} = 175°C	-	0.7	V
r_T	Slope resistance	At T_{vj} = 175°C	-	0.25	mΩ

CURVES

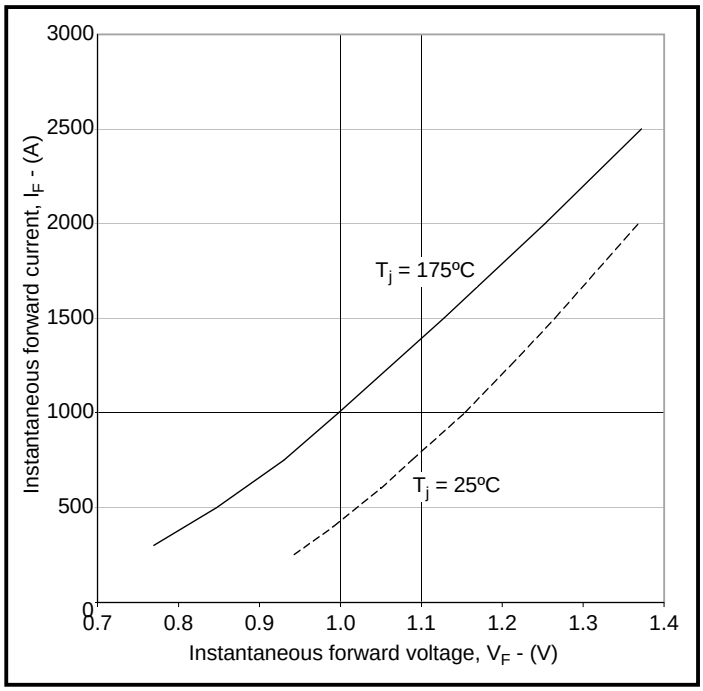


Fig.2 Maximum (limit) forward characteristics

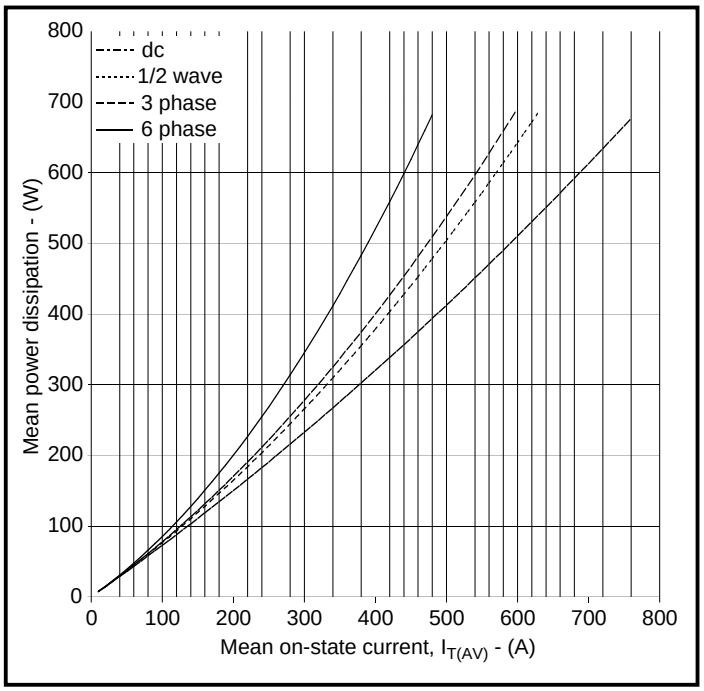


Fig.3 Power dissipation curves

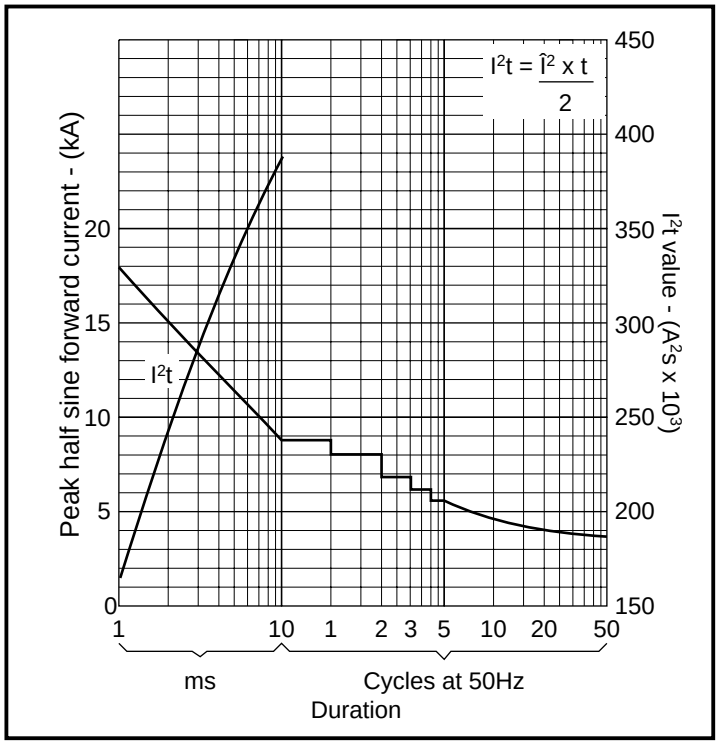


Fig.4 Surge (non-repetitive) forward current vs time (with 50% V_{RRM}, T_{case} = 175˚C)

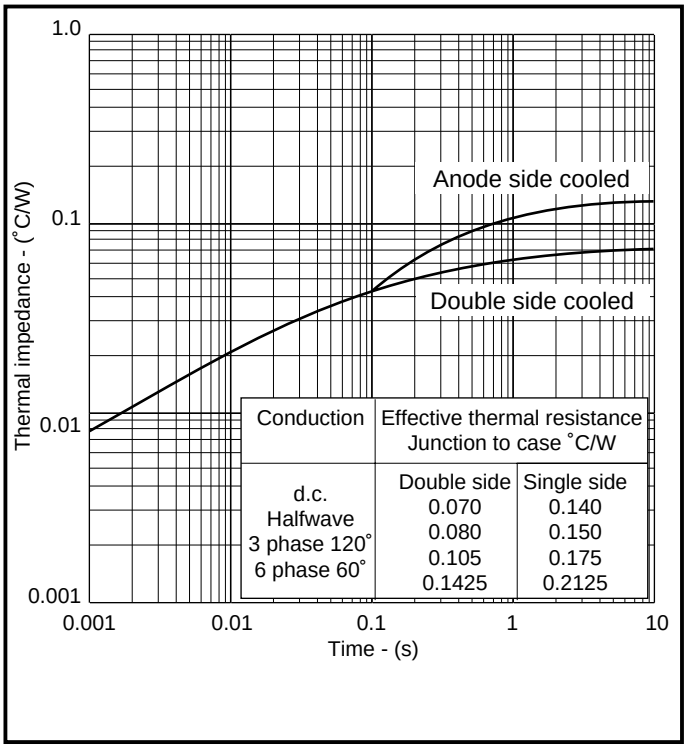
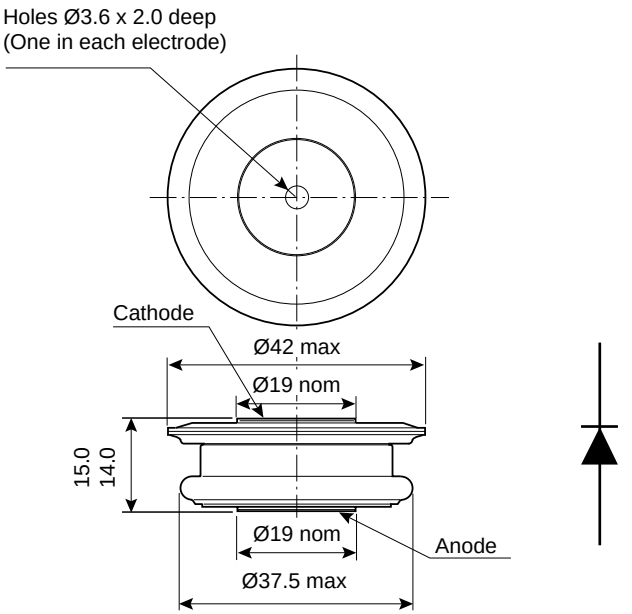


Fig.5 Maximum (limit) transient thermal impedance - junction to case - (˚C/W)

PACKAGE DETAILS

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



Nominal weight: 55g
Clamping force: 4.5kN ±10%

Package outine type code: T

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 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.

DYNEX SEMICONDUCTOR

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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 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.