

### FEATURES

- Double Side Cooling
- High Surge Capability

### APPLICATIONS

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

### VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage $V_{RRM}$ V	Conditions
DS2101SY15	1500	$V_{RSM} = V_{RRM} + 100V$

Lower voltage grades available.

### ORDERING INFORMATION

When ordering, use part number shown in the Voltage Ratings selection table. If a lower voltage grade is required, then use two a digit abbreviation for the grade required ( $V_{RRM}/100$ ) e.g.:

**DS2101SY14** for a 1400V device.

If the device is required in the slim 'V' package then substitute the 'Y' shown in the part number in the Voltage Ratings table for 'V', i.e.:

**DS2101SV15**

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

### KEY PARAMETERS

$V_{RRM}$  **1500V**

$I_{F(AV)}$  **7810A**

$I_{FSM}$  **79000A**

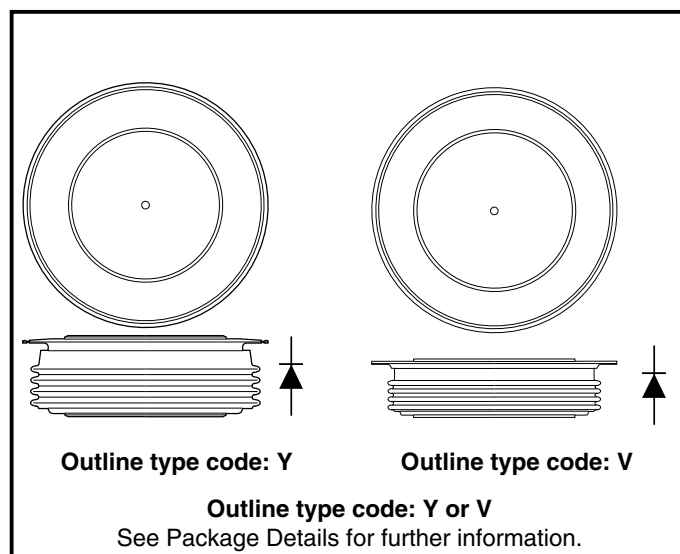


Fig. 1 Package outline

## CURRENT RATINGS

 $T_{case} = 75^{\circ}\text{C}$  unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	7810	A
$I_{F(RMS)}$	RMS value	-	12268	A
$I_F$	Continuous (direct) forward current	-	11091	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	5035	A
$I_{F(RMS)}$	RMS value	-	7909	A
$I_F$	Continuous (direct) forward current	-	6579	A

 $T_{case} = 100^{\circ}\text{C}$  unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
<b>Double Side Cooled</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	6630	A
$I_{F(RMS)}$	RMS value	-	10400	A
$I_F$	Continuous (direct) forward current	-	8600	A
<b>Single Side Cooled (Anode side)</b>				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	4220	A
$I_{F(RMS)}$	RMS value	-	6630	A
$I_F$	Continuous (direct) forward current	-	5190	A

**SURGE RATINGS**

Symbol	Parameter	Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 190^{\circ}C$	72.0	kA
$I^2t$	$I^2t$ for fusing	$V_R = 50\% V_{RRM} - 1/4$ sine	$25.9 \times 10^6$	A <sup>2</sup> s
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_{case} = 190^{\circ}C$	79.0	kA
$I^2t$	$I^2t$ for fusing	$V_R = 0$	$31.2 \times 10^6$	A <sup>2</sup> s

**THERMAL AND MECHANICAL DATA**

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.0095	$^{\circ}C/W$
		Single side cooled	Anode dc	-	0.019	$^{\circ}C/W$
			Cathode dc	-	0.019	$^{\circ}C/W$
$R_{th(c-h)}$	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	Forward (conducting)		-	200	$^{\circ}C$
		Reverse (blocking)		-	190	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	190	$^{\circ}C$
-	Clamping force			38	47	kN

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
$V_{FM}$	Forward voltage	At 3000A peak, $T_{case} = 25^{\circ}C$	-	0.95	V
$I_{RRM}$	Peak reverse current	At $V_{RRM}$ , $T_{case} = 190^{\circ}C$	-	100	mA
$Q_S$	Total stored charge	$I_F = 2000A$ , $di_{RR}/dt = 3A/\mu s$	-	1600	$\mu C$
$I_{RM}$	Peak recovery current	$T_{case} = 175^{\circ}C$ , $V_R = 100V$	-	90	A
$V_{TO}$	Threshold voltage	At $T_{vj} = 190^{\circ}C$	-	0.67	V
$r_T$	Slope resistance	At $T_{vj} = 190^{\circ}C$	-	0.038	m $\Omega$

CURVES

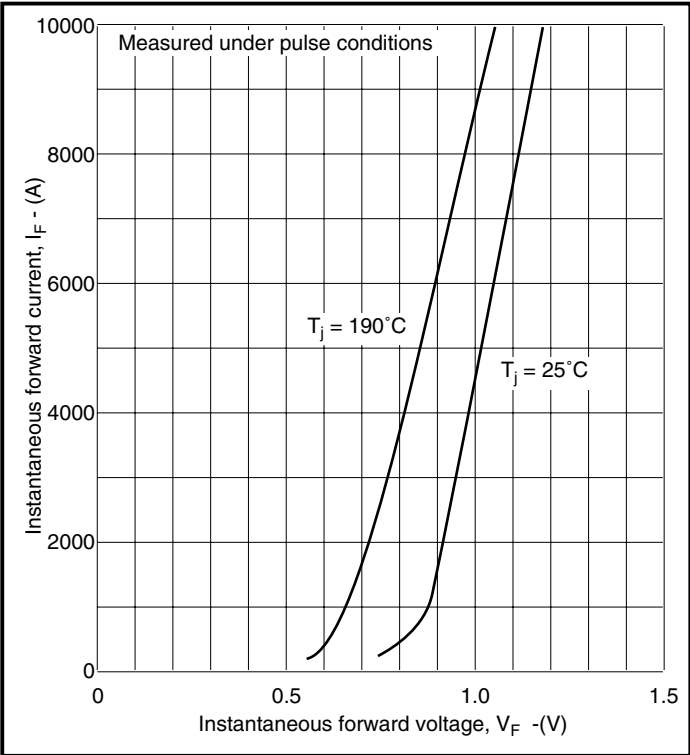


Fig.2 Maximum (limit) forward characteristics

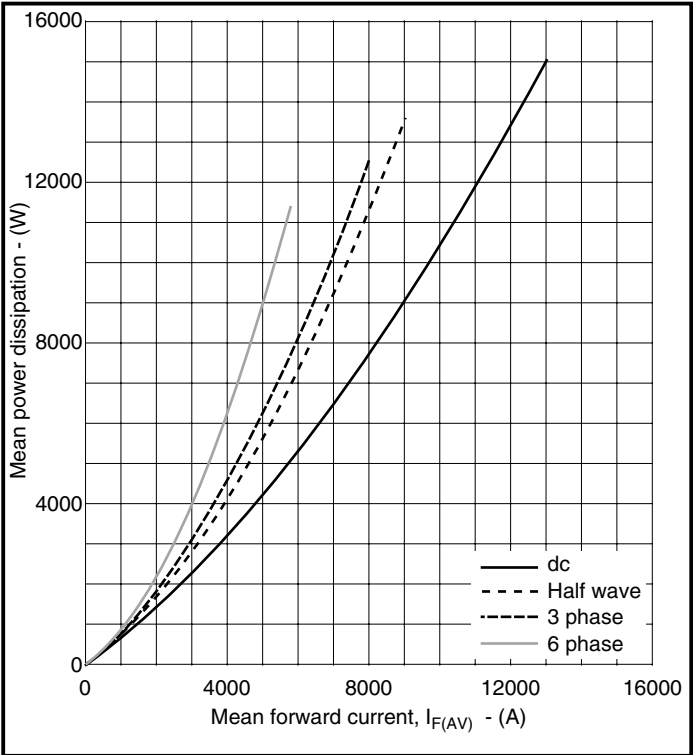


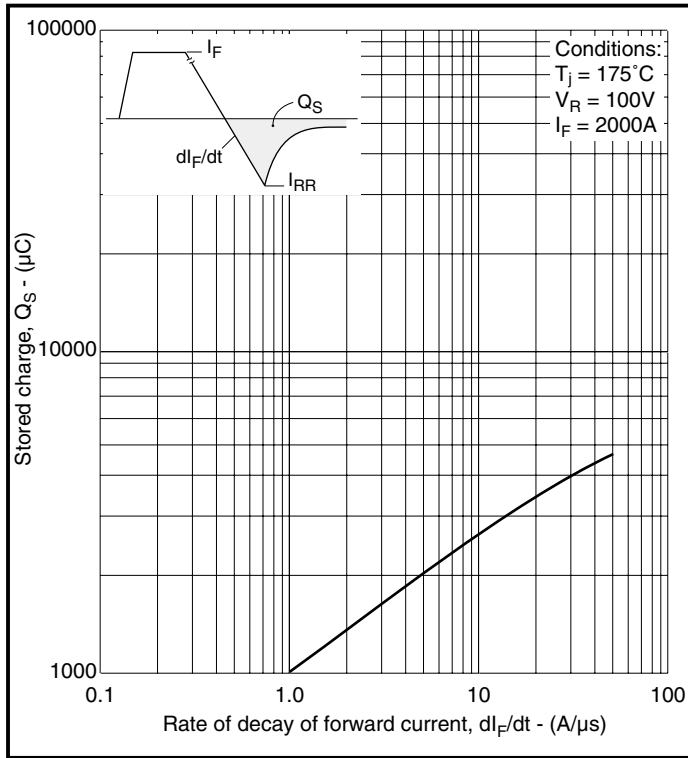
Fig.3 Dissipation curves

$V_{FM}$  Equation:-

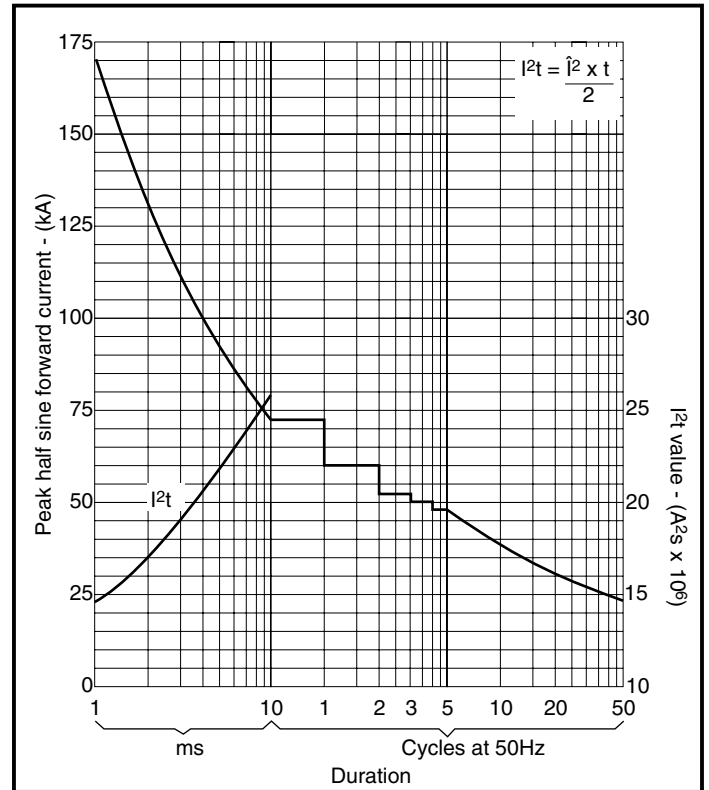
$V_{FM} = A + B \ln(I_F) + C \cdot I_F + D \cdot \sqrt{I_F}$

Where  
A = 0.081707  
B = 0.100349  
C =  $5.72 \times 10^{-5}$   
D = -0.00529

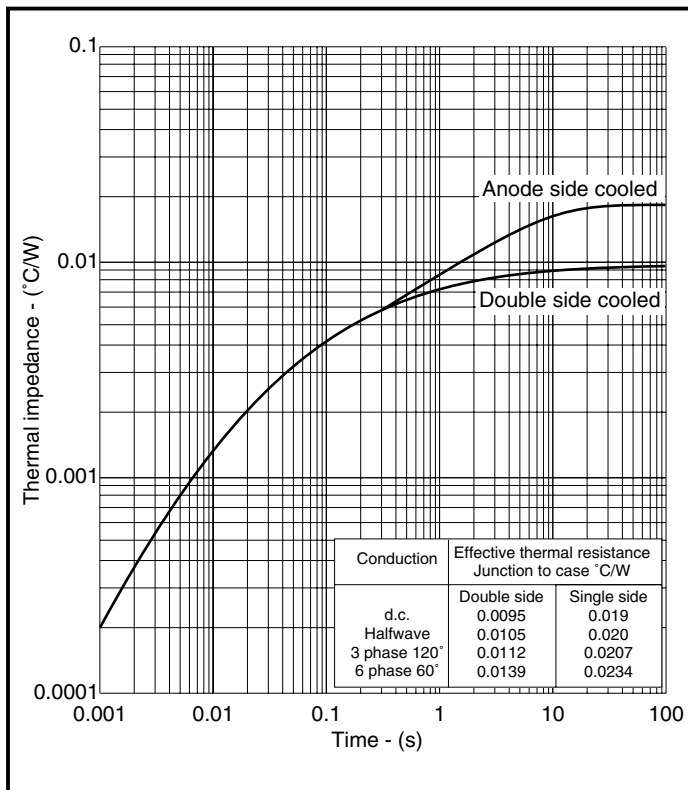
These values are valid for  $T_j = 190^{\circ}C$  for  $I_F$  500A to 10000A



**Fig.4 Total stored charge**



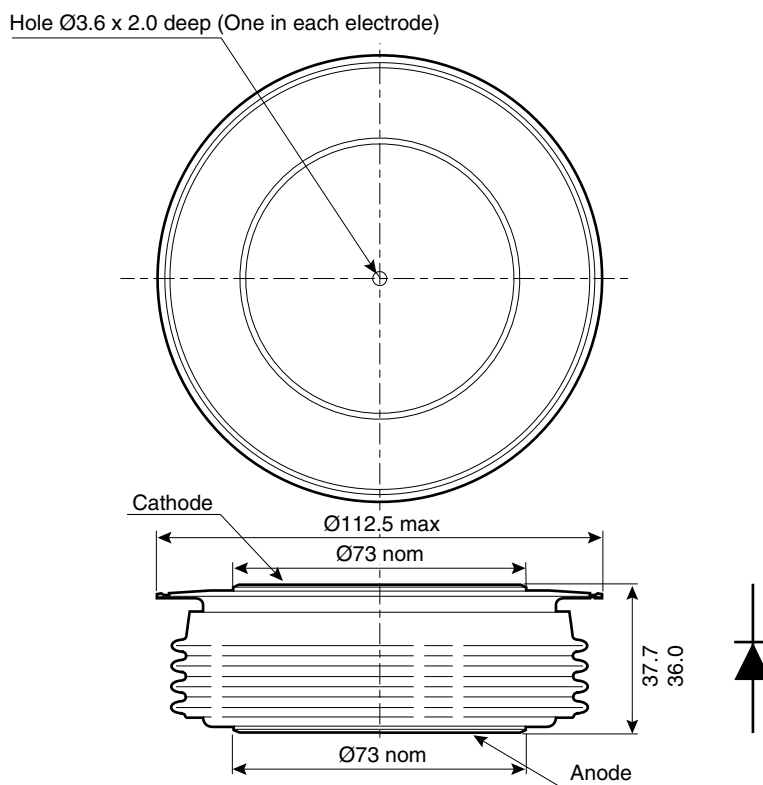
**Fig.5 Surge (non-repetitive) forward current vs time  
(with 50%  $V_{RRM}$  at  $T_{case} 190^\circ\text{C}$ )**



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

## PACKAGE DETAILS

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



Nominal weight: 1600g  
Clamping force: 43kN  $\pm 10\%$

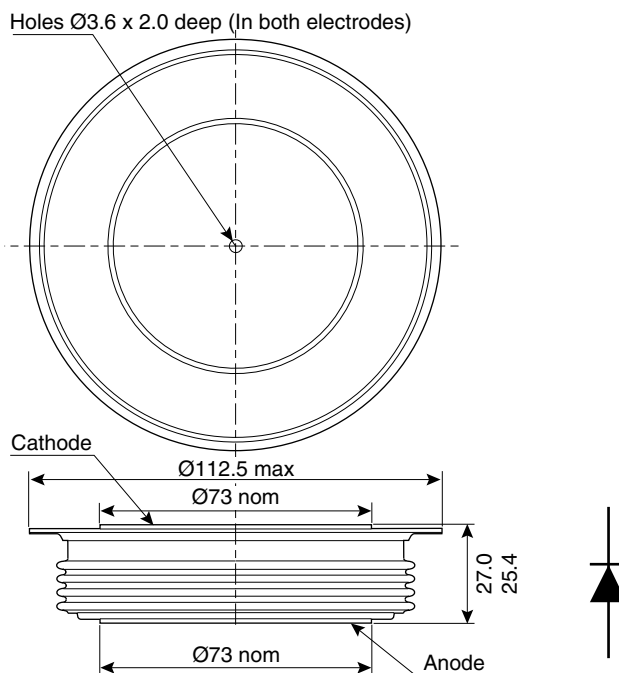
Package outline type code: Y

### Note:

Some packages may be supplied with gate pins and/or tags.

## PACKAGE DETAILS

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



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

**Package outline type code: V**

### Note:

Some packages may be supplied with gate 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.



<http://www.dynexsemi.com>

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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.

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