

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**

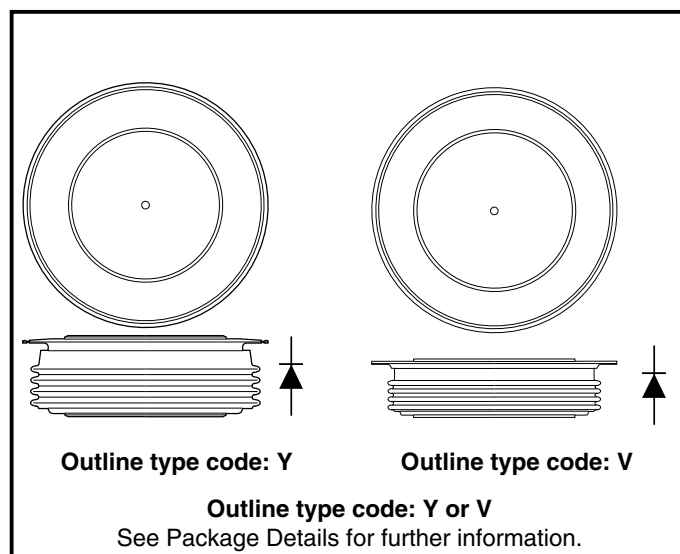


Fig. 1 Package outline

CURRENT RATINGS

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

| Symbol | Parameter | Conditions | Max. | Units |
|--|-------------------------------------|--------------------------|-------|-------|
| Double Side Cooled | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 7810 | A |
| $I_{F(RMS)}$ | RMS value | - | 12268 | A |
| I_F | Continuous (direct) forward current | - | 11091 | A |
| Single Side Cooled (Anode side) | | | | |
| $I_{F(AV)}$ | 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 |
|--|-------------------------------------|--------------------------|-------|-------|
| Double Side Cooled | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 6630 | A |
| $I_{F(RMS)}$ | RMS value | - | 10400 | A |
| I_F | Continuous (direct) forward current | - | 8600 | A |
| Single Side Cooled (Anode side) | | | | |
| $I_{F(AV)}$ | 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 | 25.9×10^6 | A ² 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 | $V_R = 0$ | 31.2×10^6 | A ² 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 °C/W |
| | | Single side cooled | Anode dc | - | 0.019 °C/W |
| | | | Cathode dc | - | 0.019 °C/W |
| $R_{th(c-h)}$ | Thermal resistance - case to heatsink | Clamping force 43kN with mounting compound | Double side | - | 0.002 °C/W |
| | | | Single side | - | 0.004 °C/W |
| T_{vj} | Virtual junction temperature | Forward (conducting) | - | 200 | °C |
| | | Reverse (blocking) | - | 190 | °C |
| T_{stg} | Storage temperature range | | -55 | 190 | °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 | $I_F = 2000A$, $di_{RR}/dt = 3A/\mu s$ $T_{case} = 175^{\circ}C$, $V_R = 100V$ | - | 1600 | μC |
| I_{RM} | Peak recovery current | | - | 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 Ω |

CURVES

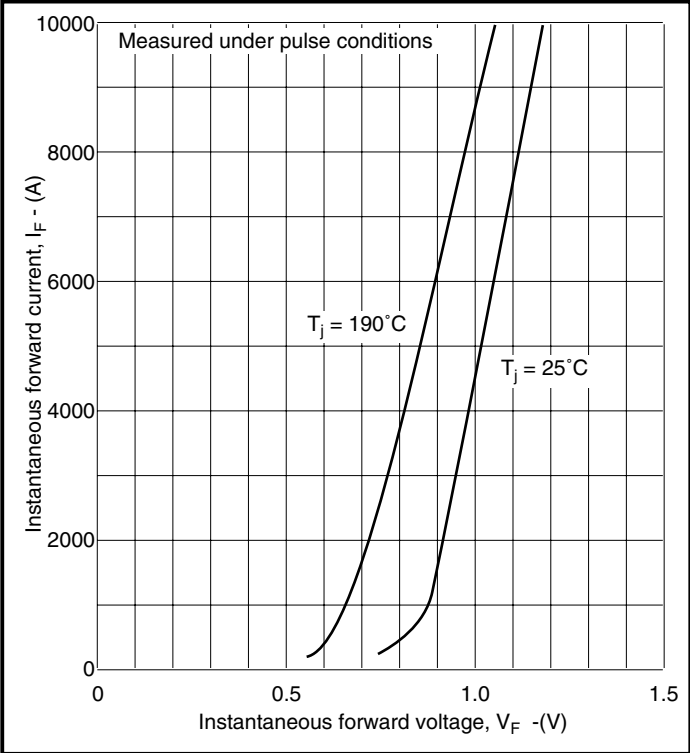


Fig.2 Maximum (limit) forward characteristics

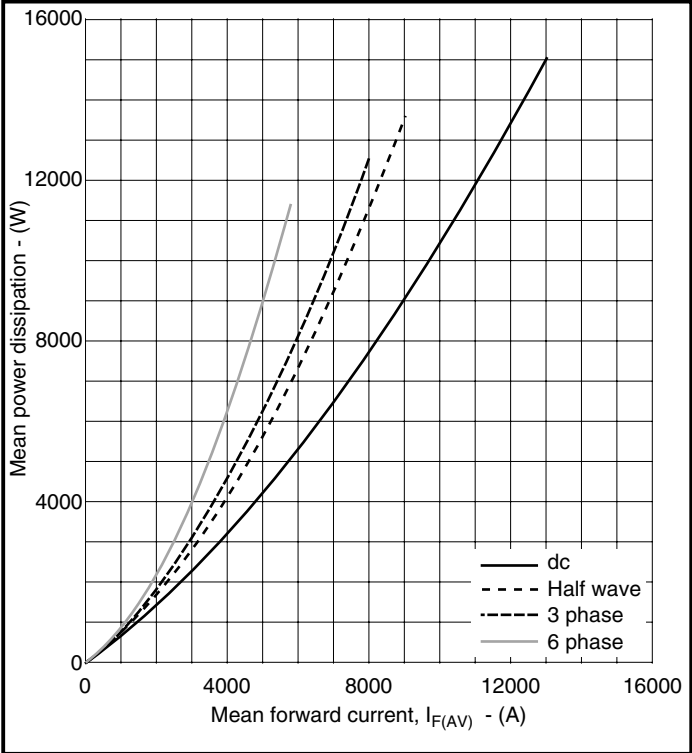


Fig.3 Dissipation curves

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 = 5.72×10^{-5}
D = -0.00529

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

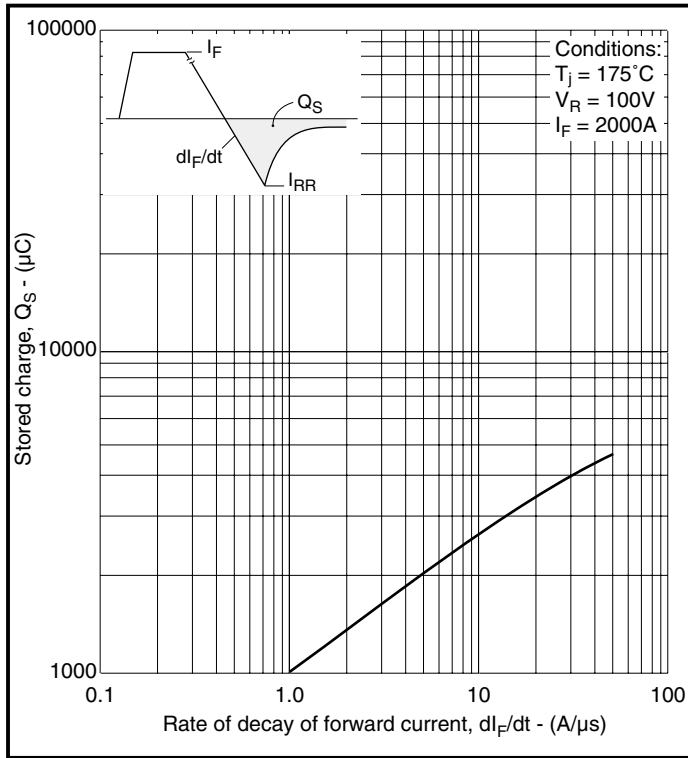
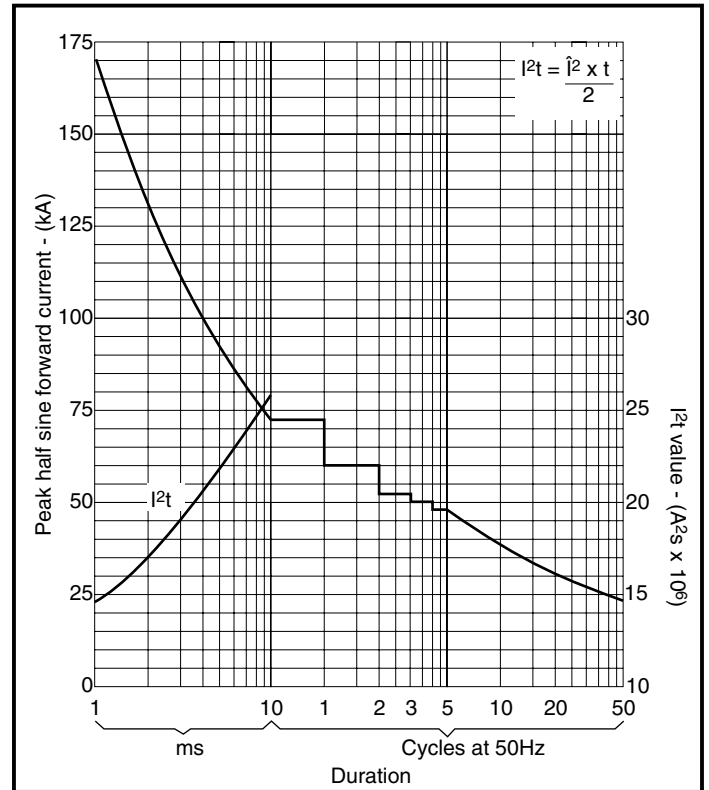
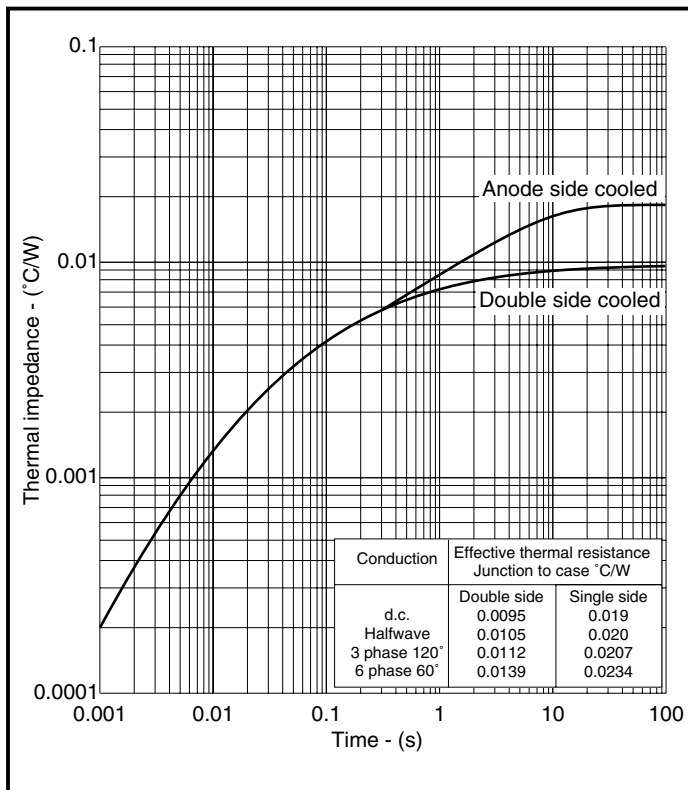


Fig.4 Total stored charge



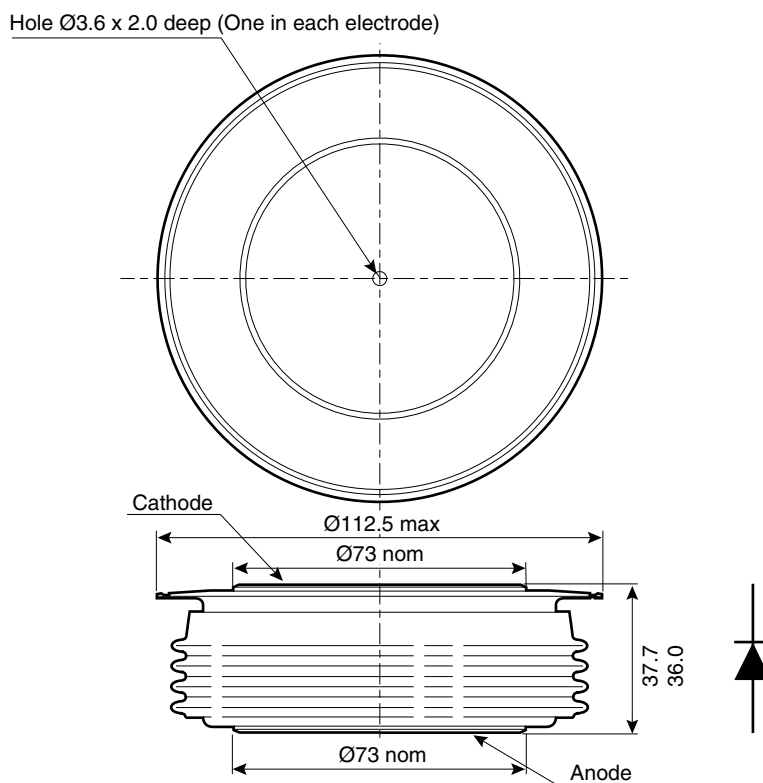
**Fig.5 Surge (non-repetitive) forward current vs time
(with 50% V_{RRM} at $T_{case} 190^\circ\text{C}$)**



**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 $\pm 10\%$

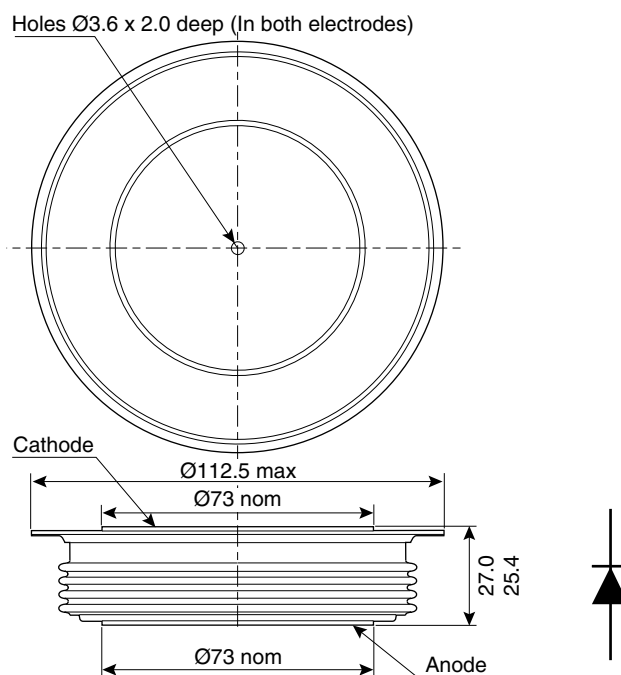
Package outline type code: Y

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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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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