

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

- Rectification
- Free-wheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

VOLTAGE RATINGS

| Part and Ordering Number | Repetitive Peak Voltages V_{DRM} and V_{DRM} V | Conditions |
|--------------------------|--|----------------------------|
| DRD2960Y40 | 4000 | $V_{RSM} = V_{RRM} + 100V$ |
| DRD2960Y39 | 3900 | |
| DRD2960Y38 | 3800 | |
| DRD2960Y37 | 3700 | |
| DRD2960Y36 | 3600 | |
| DRD2960Y35 | 3500 | |

Lower voltage grades available.

ORDERING INFORMATION

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

For example:

DRD2960Y37 for a 3700V 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.

KEY PARAMETERS

| | |
|-------------|---------------|
| V_{RRM} | 4000V |
| $I_{F(AV)}$ | 2956A |
| I_{FSM} | 62500A |

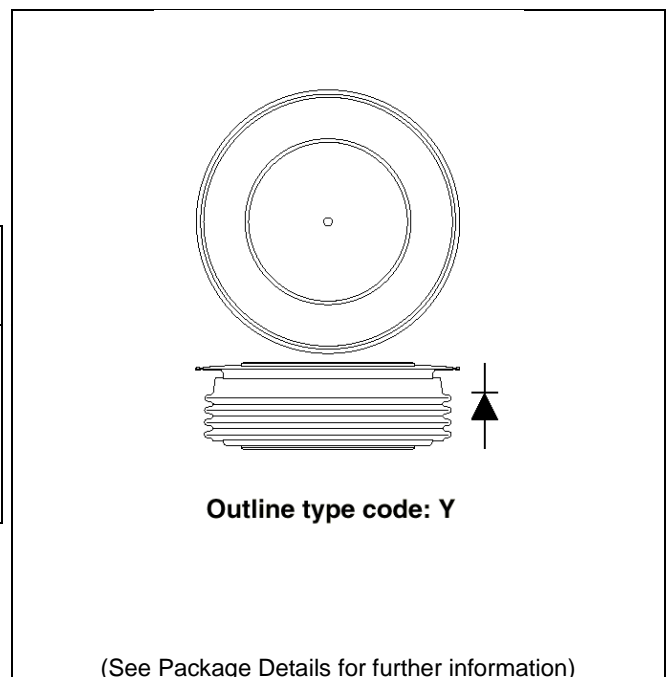


Fig. 1 Package outlines

CURRENT RATINGS

T_{case} = 75°C unless stated otherwise

| Symbol | Parameter | Test Conditions | Max. | Units |
|--|--------------------------------------|--------------------------|------|-------|
| Double Side Cooled | | | | |
| I _{F(AV)} | Mean forward current | Half wave resistive load | 3830 | A |
| I _{F(RMS)} | RMS value | - | 6016 | A |
| I _F | Continuous (direct) on-state current | - | 5597 | A |
| Single Side Cooled (Anode side) | | | | |
| I _{F(AV)} | Mean forward current | Half wave resistive load | 2525 | A |
| I _{F(RMS)} | RMS value | - | 3966 | A |
| I _F | Continuous (direct) on-state current | - | 3421 | A |

T_{case} = 100°C unless stated otherwise

| Symbol | Parameter | Test Conditions | Max. | Units |
|--|--------------------------------------|--------------------------|------|-------|
| Double Side Cooled | | | | |
| I _{F(AV)} | Mean forward current | Half wave resistive load | 2956 | A |
| I _{F(RMS)} | RMS value | - | 4643 | A |
| I _F | Continuous (direct) on-state current | - | 4218 | A |
| Single Side Cooled (Anode side) | | | | |
| I _{F(AV)} | Mean forward current | Half wave resistive load | 1913 | A |
| I _{F(RMS)} | RMS value | - | 3005 | A |
| I _F | Continuous (direct) on-state current | - | 2514 | A |

SURGE RATINGS

| Symbol | Parameter | Test Conditions | Max. | Units |
|-----------|---|---|------|-------------------|
| I_{FSM} | Surge (non-repetitive) on-state current | 10ms half sine, $T_{case} = 150^{\circ}C$ | 50.0 | kA |
| I^2t | I^2t for fusing | $V_R = 50\% V_{RRM} - 1/4$ sine | 12.5 | MA ² s |
| I_{FSM} | Surge (non-repetitive) on-state current | 10ms half sine, $T_{case} = 150^{\circ}C$ | 62.5 | kA |
| I^2t | I^2t for fusing | $V_R = 0$ | 19.6 | MA ² s |

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 | $^{\circ}C/W$ |
| | | 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 | On-state (conducting) | - | 160 | $^{\circ}C$ | |
| | | Reverse (blocking) | - | 150 | $^{\circ}C$ | |
| T_{stg} | Storage temperature range | | -55 | 150 | $^{\circ}C$ | |
| F_m | Clamping force | | 38.0 | 47.0 | kN | |

CHARACTERISTICS

| Symbol | Parameter | Test Conditions | Min. | Max. | Units |
|-----------------|-------------------------------|--|------|-------|-------|
| V _{FM} | Forward voltage | At 3000A peak, T _{case} = 25°C | - | 1.15 | V |
| I _{RM} | Peak reverse current | At V _{DRM} , T _{case} = 150°C | - | 250 | mA |
| Q _S | Total stored charge | I _F = 2000A, dI _{RR} /dt = 3A/μs | - | 5000 | μC |
| I _{rr} | Peak reverse recovery current | T _{case} = 150°C, V _R = 100V | - | 150 | A |
| V _{TO} | Threshold voltage | At T _{vj} = 150°C | - | 0.75 | V |
| r _T | Slope resistance | At T _{vj} = 150°C | - | 0.118 | mΩ |

CURVES

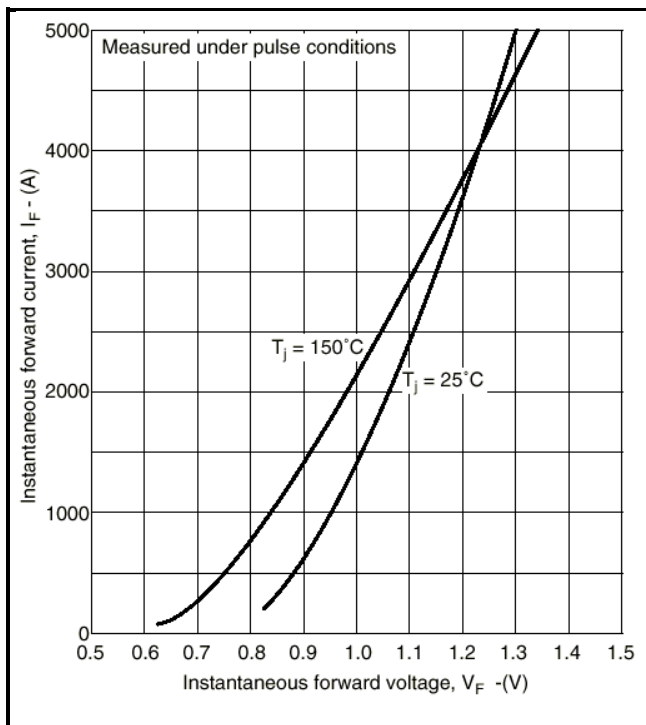


Fig.2 Maximum (limit) on-state characteristics

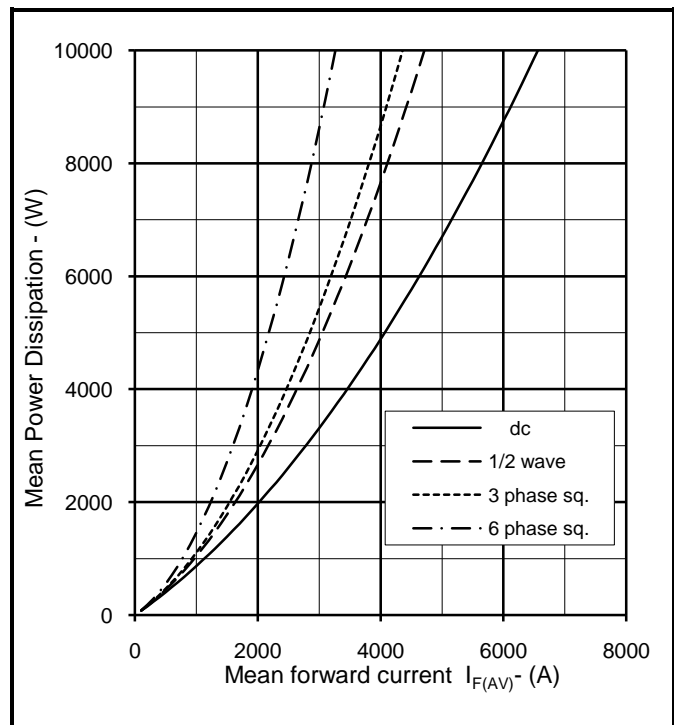


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = - 0.15357
 B = 0.177571
 C = 0.000179
 D = - 0.01294

these values are valid for T_j = 150°C for I_F 500A to 5000A

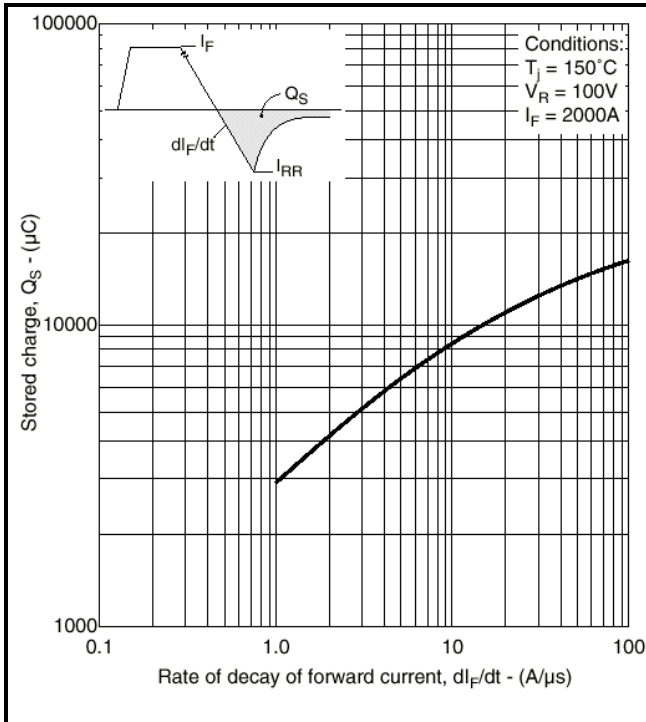


Fig.4 Total stored charge

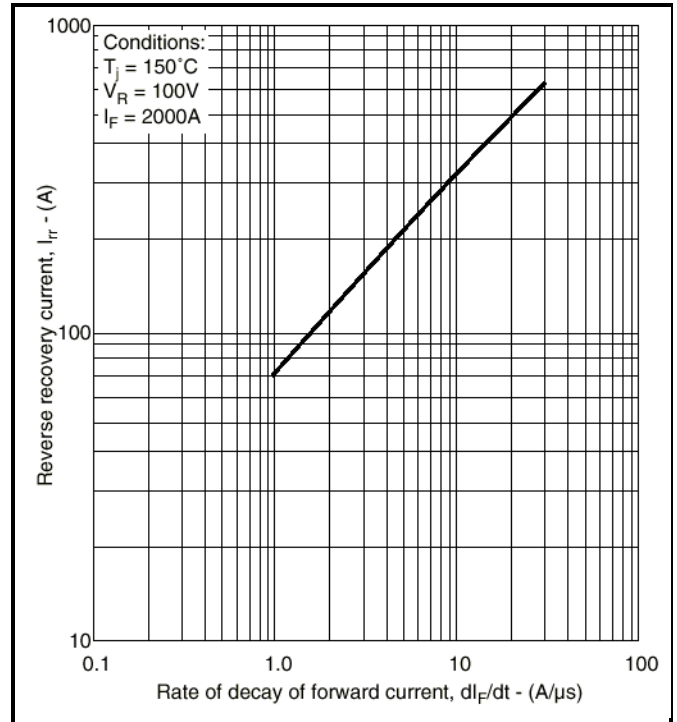


Fig.5 Maximum reverse recovery current

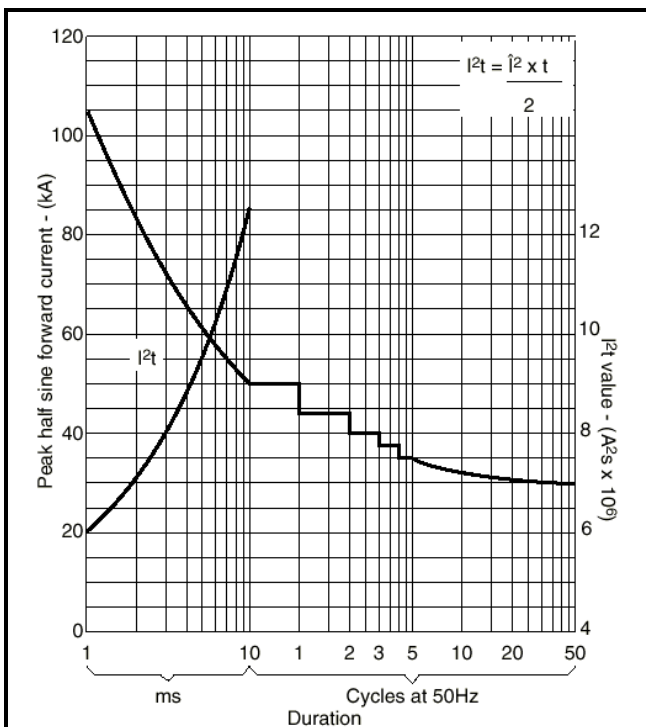


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at $T_{case} 150^\circ\text{C}$)

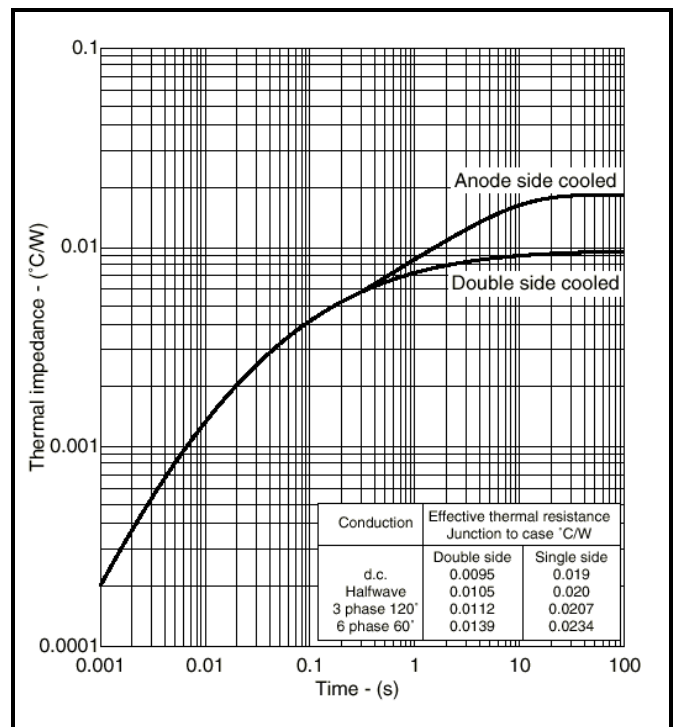
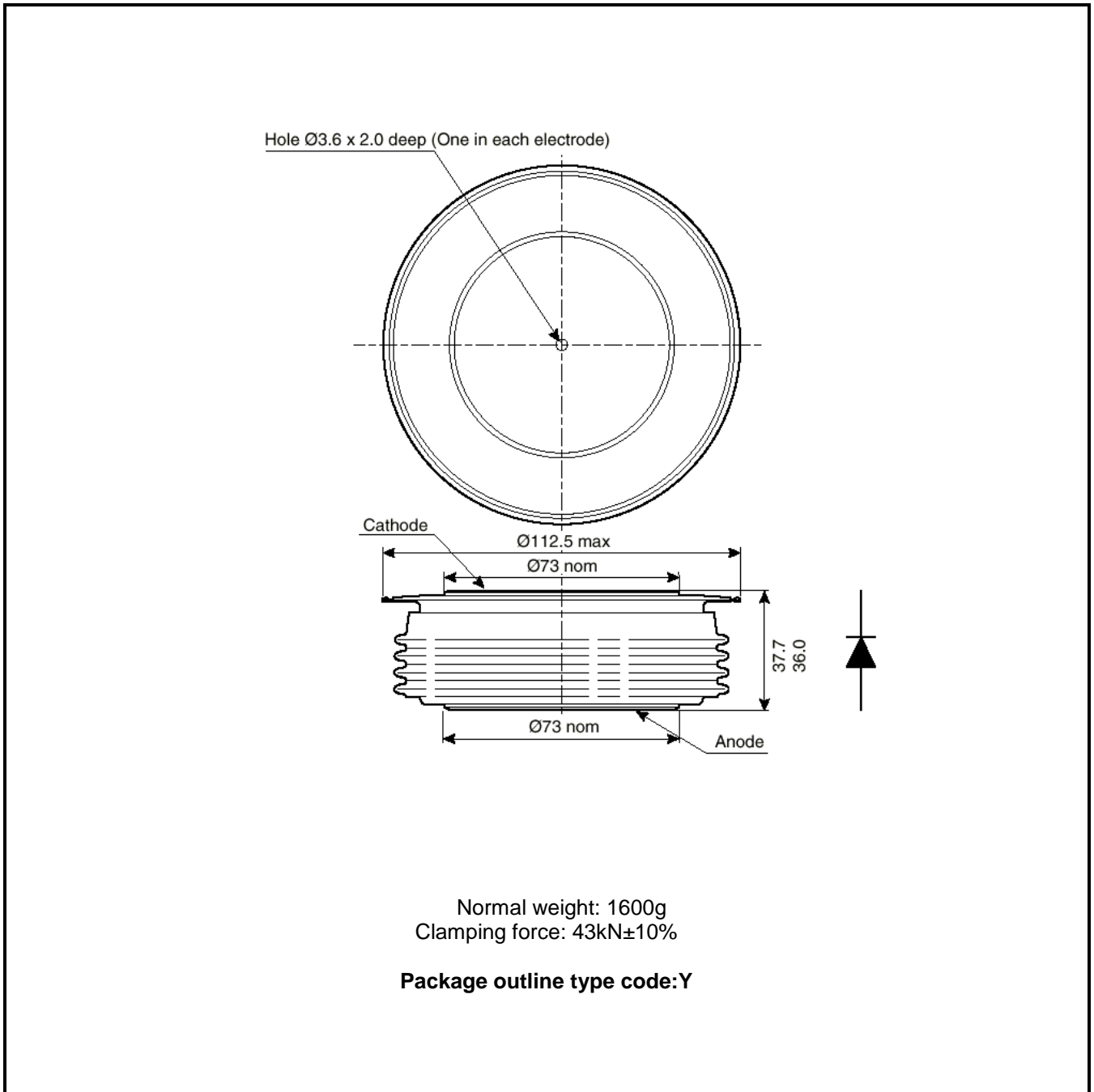


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



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

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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. |
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