# DRD4780Y26

## Rectifier Diode

Replaces DS4172-6.0 February 2003 – Datasheet DS2103SY/DS2103SV

DS6230-1 February 2018 (LN35175)

## FEATURES

- Double Side Cooling
- High Surge Capability

## KEY PARAMETERS

| | |
|---|---|
| $V_{RRM}$ | **2600V** |
| $I_{F(AV)}$ | **5788A** |
| $I_{FSM}$ | **81kA** |

## VOLTAGE RATINGS

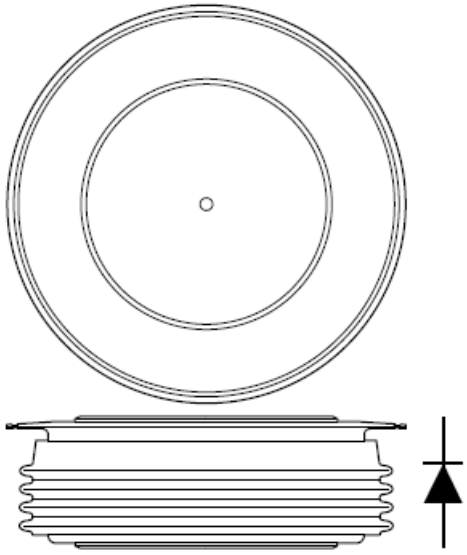
| Part and Ordering Number | Repetitive Peak Voltages $V_{RRM}$ V | Conditions |
|---|---|---|
| DRD4780Y26<br>DRD4780Y24<br>DRD4780Y22 | 2600<br>2400<br>1600 | $V_{RSM} = V_{RRM}+100V$ |

## ORDERING INFORMATION

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

For example:

**DRD4780Y24** for a 2400V device



**Outline type code: Y**

See Package Details for further information.

**Fig. 1 Package outline**

## 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 | 5788 | A |
| $I_{F(RMS)}$ | RMS value | - | 9076 | A |
| $I_F$ | Continuous (direct) on-state current | - | 8278 | A |
| **Single Side Cooled (Anode side)** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 3751 | A |
| $I_{F(RMS)}$ | RMS value | - | 5892 | A |
| $I_F$ | Continuous (direct) on-state current | - | 4955 | 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 | 4784 | A |
| $I_{F(RMS)}$ | RMS value | - | 7516 | A |
| $I_F$ | Continuous (direct) on-state current | - | 6725 | A |
| **Single Side Cooled (Anode side)** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 3060 | A |
| $I_{F(RMS)}$ | RMS value | - | 4807 | A |
| $I_F$ | Continuous (direct) on-state current | - | 3950 | A |

## SURGE RATINGS

| Symbol | Parameter | Test Conditions | Max. | Units |
|---|---|---|---|---|
| $I_{FSM}$ | Surge (non-repetitive) on-state current | 10ms half sine, $T_{case}$ = 175°C | 65.0 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 50% $V_{RRM}$ - ¼ sine | 21.1 | $MA^2s$ |
| $I_{FSM}$ | Surge (non-repetitive) on-state current | 10ms half sine, $T_{case}$ = 175°C | 81 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 0 | 33 | $MA^2s$ |

## THERMAL AND MECHANICAL RATINGS

| Symbol | Parameter | Test Conditions | | Min. | Max. | Units |
|---|---|---|---|---|---|---|
| $R_{th(j-c)}$ | Thermal resistance – junction to case | Double side cooled | DC | - | 0.0095 | °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 | Double side | - | 0.002 | °C/W |
| | | (with mounting compound) | Single side | - | 0.004 | °C/W |
| $T_{vj}$ | Virtual junction temperature | On-state (conducting) | | - | 185 | °C |
| | | Reverse (blocking) | | - | 175 | °C |
| $T_{stg}$ | Storage temperature range | | | -55 | 175 | °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 | - | 1.05 | V |
| $I_{RM}$ | Peak reverse current | At $V_{RRM}$, $T_{case}$ = 175°C | - | 150 | mA |
| $Q_S$ | Total stored charge | $I_F$ = 2000A, $dI_{RR}/dt$ =3A/µs | - | 3000 | µC |
| $I_{rr}$ | Peak reverse recovery current | $T_{case}$ = 175°C, $V_R$ =100V | - | 125 | A |
| $V_{TO}$ | Threshold voltage | At $T_{vj}$ = 175°C | - | 0.75 | V |
| $r_T$ | Slope resistance | At $T_{vj}$ = 175°C | - | 0.063 | mΩ |

## CURVES

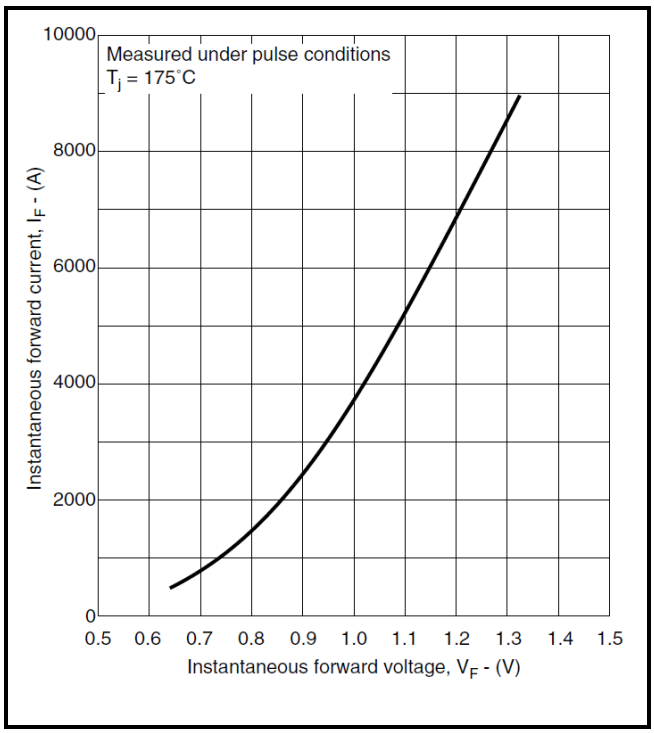



**Fig.2 Maximum & minimum on-state characteristics**

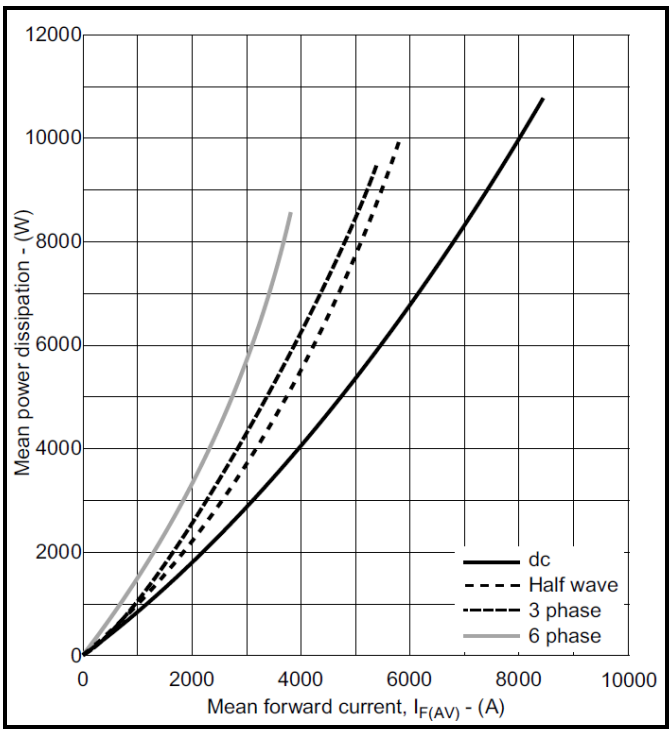



**Fig.3 Dissipation curves**

### $V_{TM}$ EQUATION

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

Where A = -0.51826
B = 0.195881
C = $6.39 \times 10^{-5}$
D = -0.00544

these values are valid for $T_j$ = 175°C for $I_F$ 500A to 9000A

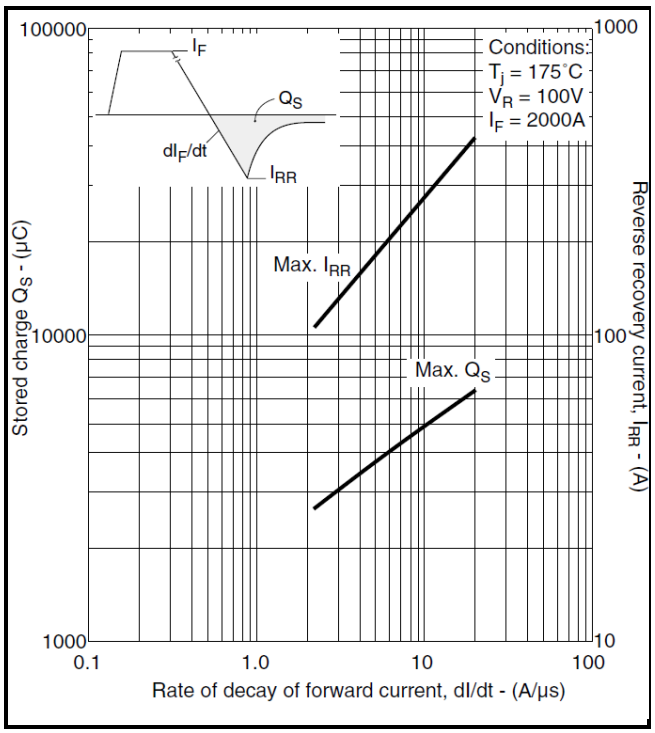



**Fig.4 Total stored charge & Maximum reverse recovery current**

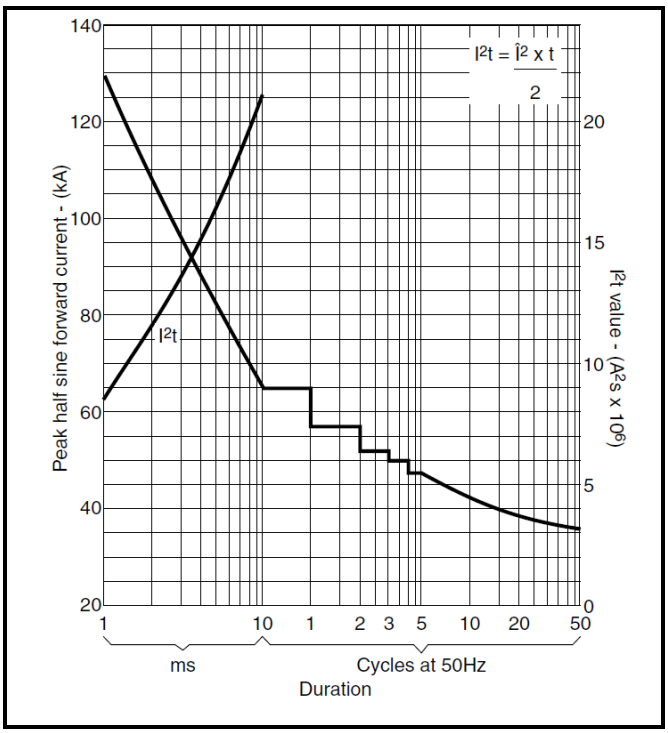



**Fig.5 Surge (Non-Repetitive) Forward current vs time**

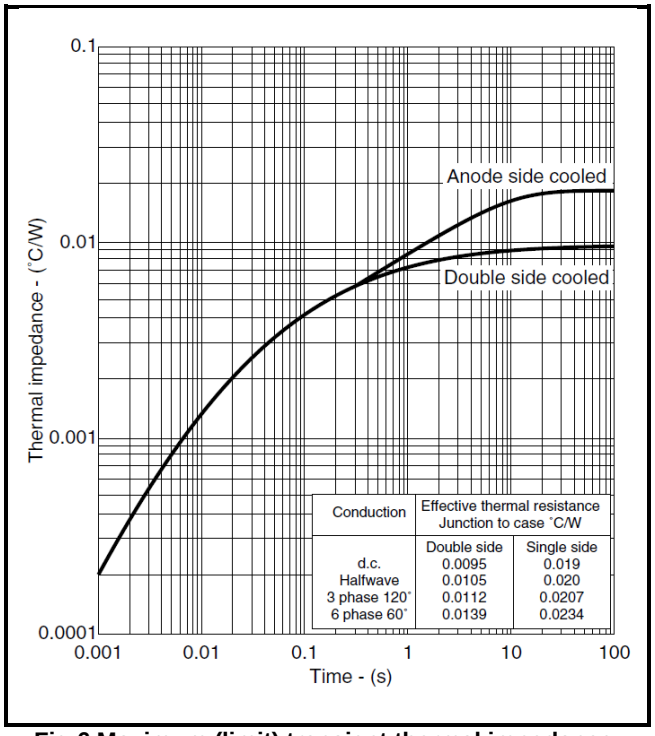
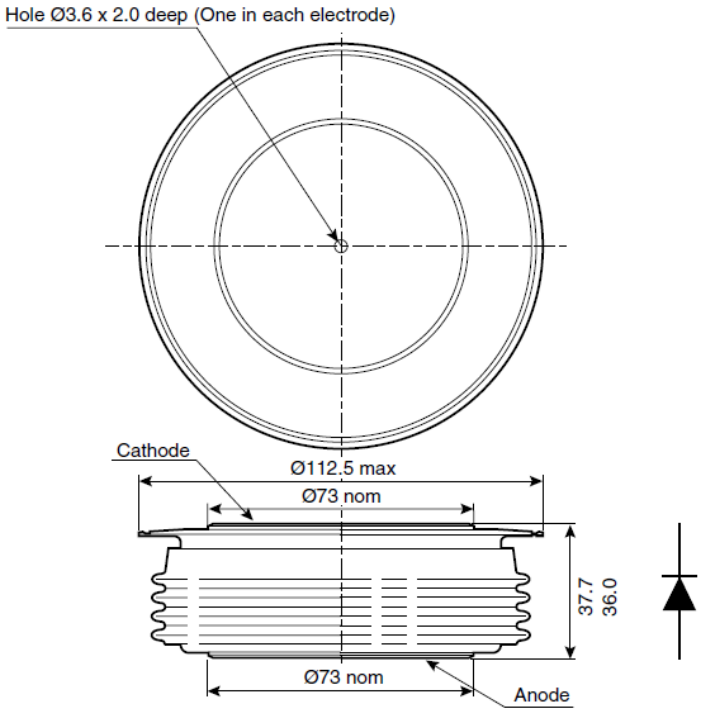



**Fig.6 Maximum (limit) transient thermal impedance-junction to case**

## PACKAGE DETAILS

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




Nominal weight: 1600g
Clamping force: 43kN ±10%

**Package outline type code: Y**

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

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