# RD43FF

## Rectifier Diode

Target Information

Replaces November 2000, version DS5414-1.1

DS5414-2.0 October 2001

### FEATURES

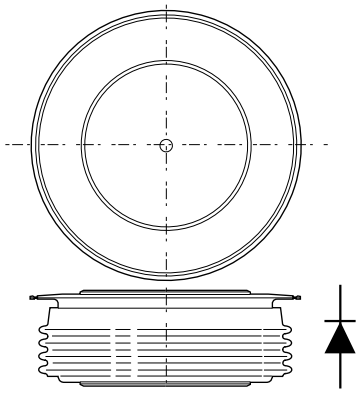
- Optimised For High Current Rectifiers
- High Surge Capability
- Very Low On-state Voltage

### APPLICATIONS

- Electroplating
- Power Supplies
- Welding

### KEY PARAMETERS

| | | |
|---|---|---|
| $V_{RRM}$ | | **600V** |
| $I_{F(AV)}$ | **(max)** | **4466A** |
| $I_{FSM}$ | **(max)** | **51500A** |



**Outline type code:** F

(See Package Details for further information)

**Fig. 1 Package outline**

### VOLTAGE RATINGS

| Part and Ordering Number | Repetitive Peak Reverse Voltage $V_{RRM}$ V | Conditions |
|---|---|---|
| RD43FF06 | 600 | $V_{RSM} = V_{RRM}$ |
| RD43FF05 | 500 | |
| RD43FF04 | 400 | |
| RD43FF03 | 300 | |
| RD43FF02 | 200 | |
| RD43FF01 | 100 | |

### ORDERING INFORMATION

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

For example:

**RD43FF04**

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

## CURRENT RATINGS

**$T_{case}$ = 75°C unless otherwise stated**

| Symbol | Parameter | Conditions | Max. | Units |
|---|---|---|---|---|
| **Double Side Cooled** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 4466 | A |
| $I_{F(RMS)}$ | RMS value | - | 7014 | A |
| $I_F$ | Continuous (direct) forward current | - | 6189 | A |
| **Single Side Cooled (Anode side)** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 3133 | A |
| $I_{F(RMS)}$ | RMS value | - | 4922 | A |
| $I_F$ | Continuous (direct) forward current | - | 4066 | A |

**$T_{case}$ = 85°C unless otherwise stated**

| Symbol | Parameter | Test Conditions | Max. | Units |
|---|---|---|---|---|
| **Double Side Cooled** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 4220 | A |
| $I_{F(RMS)}$ | RMS value | - | 6630 | A |
| $I_F$ | Continuous (direct) forward current | - | 5815 | A |
| **Single Side Cooled** | | | | |
| $I_{F(AV)}$ | Mean forward current | Half wave resistive load | 2950 | A |
| $I_{F(RMS)}$ | RMS value | - | 4635 | A |
| $I_F$ | Continuous (direct) forward current | - | 3805 | A |

## SURGE RATINGS

| Symbol | Parameter | Test Conditions | Max. | Units |
|---|---|---|---|---|
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine, $T_{case}$ = 175˚C | 41.2 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 50% $V_{RRM}$ - 1/4 sine | 8.49 x $10^6$ | $A^2s$ |
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine, $T_{case}$ = 175˚C | 51.5 | kA |
| $I^2t$ | $I^2t$ for fusing | $V_R$ = 0 | 13.26 x $10^6$ | $A^2s$ |

## THERMAL AND MECHANICAL RATINGS

| Symbol | Parameter | Test Conditions | | Min. | Max. | Units |
|---|---|---|---|---|---|---|
| $R_{th(j-c)}$ | Thermal resistance - junction to case | Double side cooled | DC | - | 0.022 | ˚CW |
| | | Single side cooled | Anode DC | - | 0.038 | ˚CW |
| | | | Cathode DC | - | 0.052 | ˚CW |
| $R_{th(c-h)}$ | Thermal resistance - case to heatsink | Clamping force 19.5kN | Double side | - | 0.004 | ˚CW |
| | | (with mounting compound) | Single side | - | 0.008 | ˚CW |
| $T_{vj}$ | Virtual junction temperature | Forward (conducting) | | - | 225 | ˚C |
| | | Reverse (blocking) | | - | 200 | ˚C |
| $T_{stg}$ | Storage temperature range | | | –55 | 200 | ˚C |
| $F_m$ | Clamping force | | | 17.6 | 21.6 | kN |

## CHARACTERISTICS

| Symbol | Parameter | Test Conditions | Min. | Max. | Units |
|---|---|---|---|---|---|
| $I_{RM}$ | Peak reverse current | At $V_{RRM}$, $T_{case}$ = 200˚C | - | 50 | mA |
| $I_{rr}$ | Peak reverse recovery current | $I_F$ = 2000A, $dI_{RR}/dt$ = 3A/µs, | - | 25 | A |
| $Q_S$ | Total stored charge | $T_{case}$ = 200˚C, $V_R$ = 100V | - | 150 | µC |
| $V_{TO}$ | Threshold voltage | At $T_{vj}$ = 200˚C | - | 0.6 | V |
| $r_T$ | Slope resistance | At $T_{vj}$ = 200˚C | - | 0.0514 | mΩ |

## CURVES

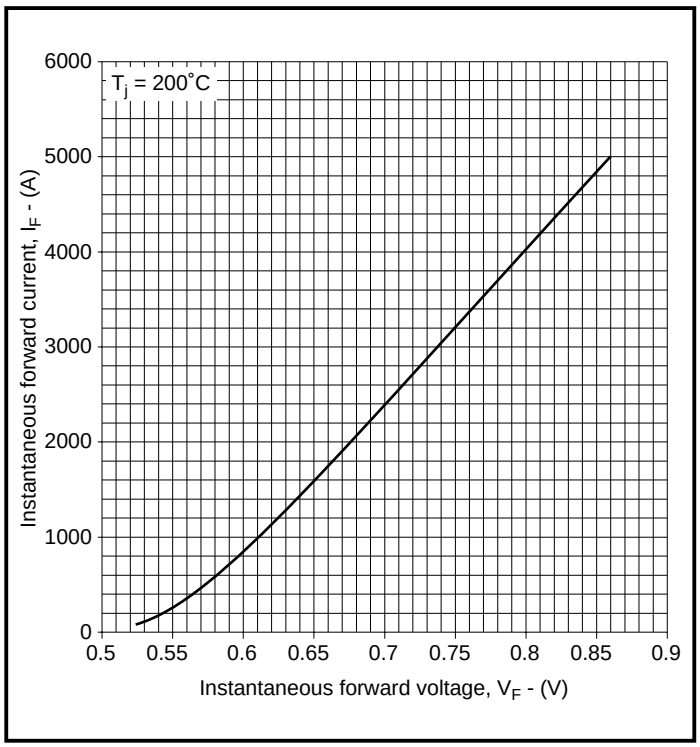



**Fig. 2 Maximum (limit) forward characteristics**

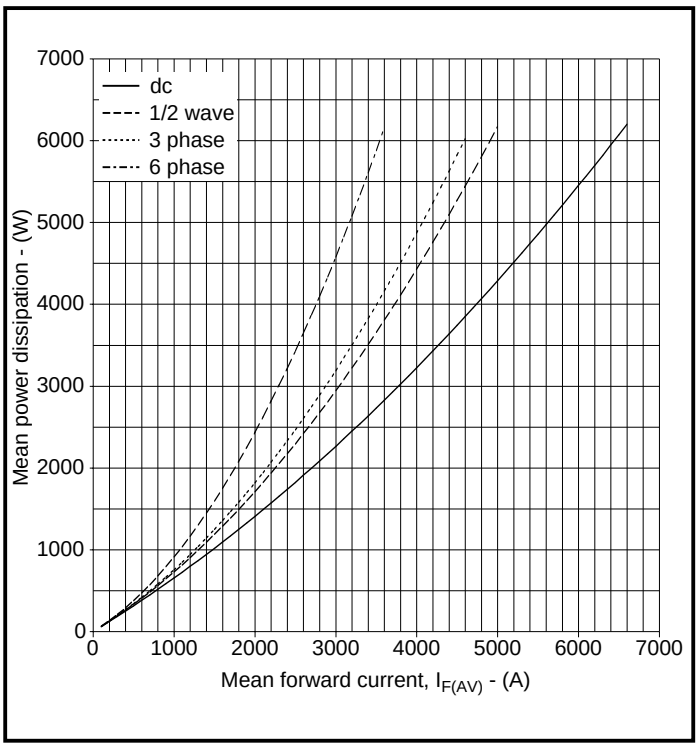



**Fig. 3 Power dissipation**

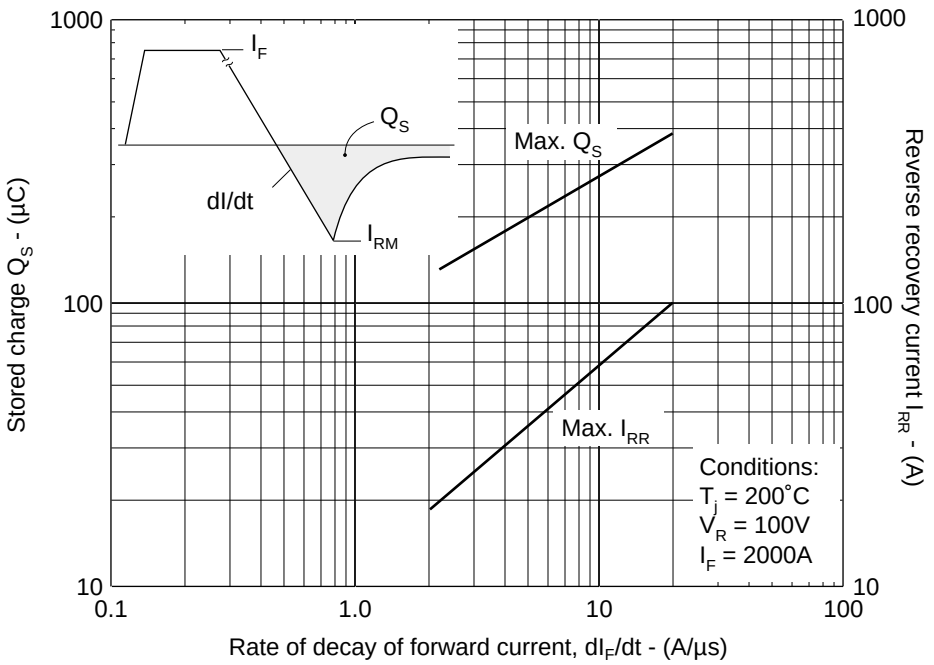



**Fig. 4 Maximum stored charge and reverse recovery current vs dI/dt**

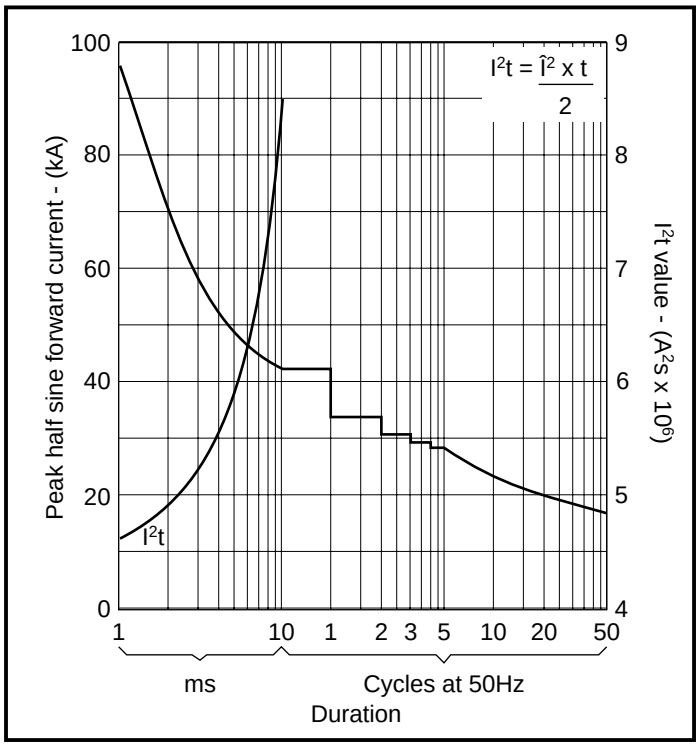
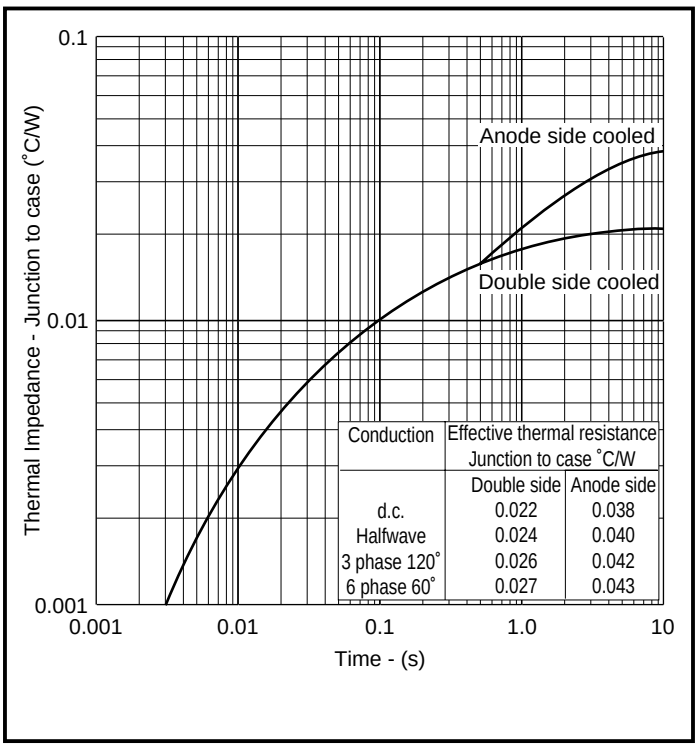



**Fig. 5 Surge (non-repetitive) forward current vs time (with 50% $V_{RRM}$ @ $T_{case}$ = 175˚C)**

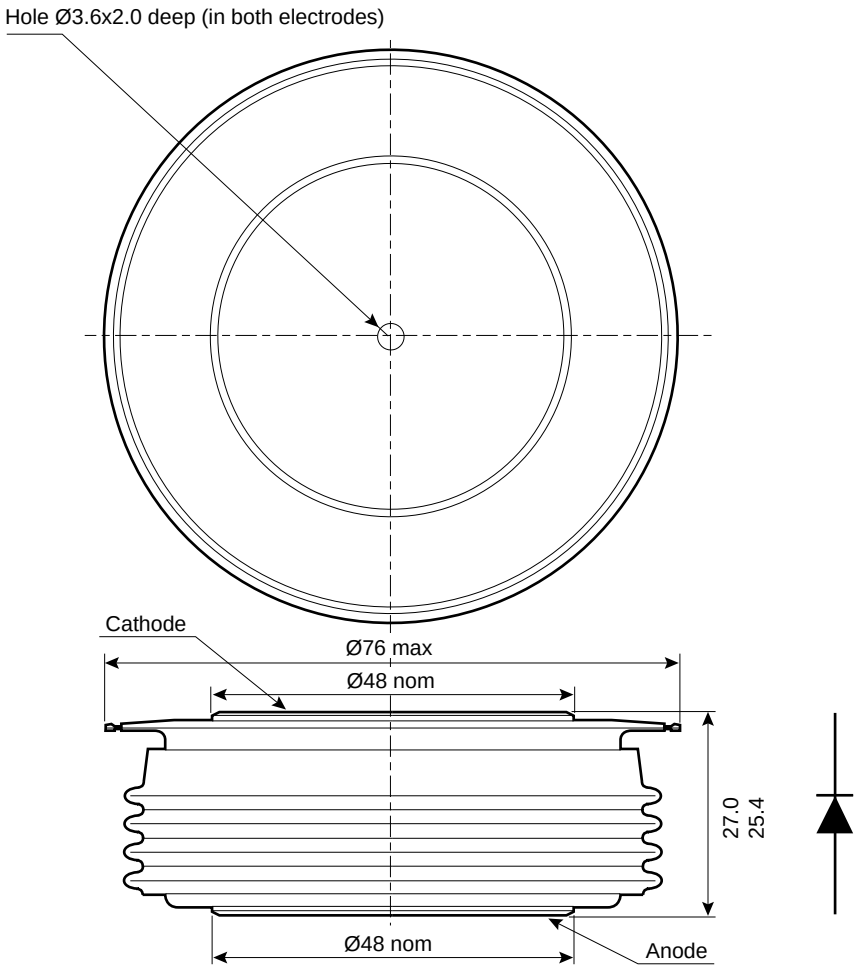



| Conduction | Effective thermal resistance Junction to case ˚C/W | |
|---|---|---|
| | Double side | Anode side |
| d.c. | 0.022 | 0.038 |
| Halfwave | 0.024 | 0.040 |
| 3 phase 120˚ | 0.026 | 0.042 |
| 6 phase 60˚ | 0.027 | 0.043 |

**Fig. 6 Maximum (limit) transient thermal impedance**

## PACKAGE DETAILS

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




Nominal weight: 450g
Clamping force: 19.6kN ± 10%

**Package outline type code: F**

**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.