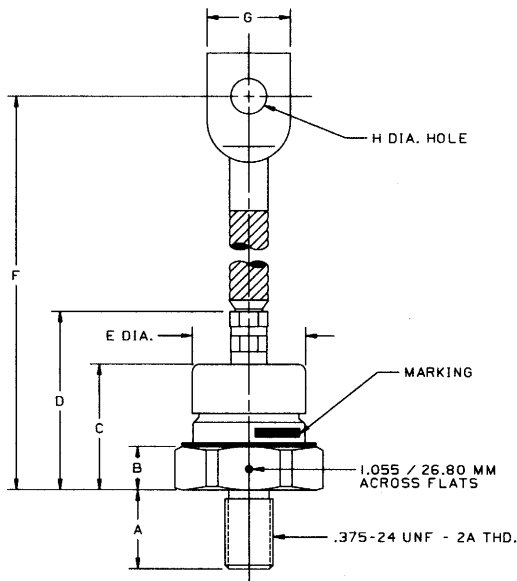


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
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**Fast Recovery  
Rectifier**  
100 Amperes Average  
1200 Volts



| CASE NUMBER R50<br>NOMINAL DIMENSIONS |      |     |      |      |      |       |      |      |       |       |
|---------------------------------------|------|-----|------|------|------|-------|------|------|-------|-------|
| SYM.                                  | A    | B   | C    | D    | E    | F     | G    | H    | J     | K     |
| INCHES                                | .63  | .34 | .98  | 1.58 | .89  | 4.48  | .63  | .281 | ----- | ----- |
| MM                                    | 16.0 | 8.6 | 24.9 | 40.1 | 22.6 | 113.8 | 16.0 | 7.14 | ----- | ----- |

ALL DIMENSIONS ARE REFERENCE

**R502\_\_10/R503\_\_10** (Outline Drawing)



**R502\_\_10/R503\_\_10**  
**Fast Recovery Rectifier**  
100 Amperes Average, 1200 Volts

## Ordering Information:

Select the complete part number you desire from the following table:

| Type                           | Voltage                     |      | Current                   |      | Recovery Time             |      | Leads |      |
|--------------------------------|-----------------------------|------|---------------------------|------|---------------------------|------|-------|------|
|                                | V <sub>RRM</sub><br>(Volts) | Code | I <sub>F(av)</sub><br>(A) | Code | t <sub>rr</sub><br>(nsec) | Code | Case  | Code |
| R502<br>(Standard<br>Polarity) | 200                         | 02   | 100                       | 10   | 300                       | RS   | DO-8  | WA   |
|                                | 400                         | 04   |                           |      |                           |      |       |      |
|                                | 600                         | 06   |                           |      |                           |      |       |      |
| R503<br>(Reverse<br>Polarity)  | 800                         | 08   |                           |      |                           |      |       |      |
|                                | 1000                        | 10   |                           |      |                           |      |       |      |
|                                | 1200                        | 12   |                           |      |                           |      |       |      |

**Example:** Type R502 rated at 100A average with V<sub>RRM</sub> = 1200V,  
Recovery Time = 300nsec and standard flexible lead, order as:

| Type    | Voltage | Current | Time | Leads |
|---------|---------|---------|------|-------|
| R 5 0 2 | 1 2     | 1 0     | RS   | W A   |

## Features:

- ☐ Fast Recovery Times
- ☐ Soft Recovery Characteristics
- ☐ Standard and Reverse Polarities
- ☐ Flag Lead and Stud Top Terminals Available
- ☐ High Surge Current Ratings
- ☐ High Rated Blocking Voltages
- ☐ Special Electrical Selection for Parallel and Series Operation
- ☐ Glazed Ceramic Seal Gives High Voltage Creepage and Strike Paths

## Applications:

- ☐ Inverters
- ☐ Choppers
- ☐ Transmitters
- ☐ Free Wheeling Diode

**R502 \_\_10/R503 \_\_10**  
**Fast Recovery Rectifier**  
100 Amperes Average, 1200 Volts

## Absolute Maximum Ratings

| Characteristics                               | Symbol       | R502 __10/R503 __10 | Units              |
|-----------------------------------------------|--------------|---------------------|--------------------|
| RMS Forward Current                           | $I_{F(rms)}$ | 150                 | Amperes            |
| Average Forward Current                       | $I_{F(av)}$  | 100                 | Amperes            |
| One-half Cycle Surge Current                  | $I_{FSM}$    | 2200                | Amperes            |
| 3 Cycle Surge Current                         | $I_{FSM}$    | 1800                | Amperes            |
| 10 Cycle Surge Current                        | $I_{FSM}$    | 1350                | Amperes            |
| $I^2t$ (for Fusing), Times = 8.3 milliseconds | $I^2t$       | 20000               | A <sup>2</sup> sec |
| Storage Temperature                           | $T_{stg}$    | -40 to +200         | °C                 |
| Operating Temperature                         | $T_j$        | -40 to +150         | °C                 |
| Mounting Torque                               |              | 120                 | in-lb              |

## Electrical and Thermal Characteristics

| Characteristics | Symbol | Test Conditions | R502 __10/R503 __10 | Units |
|-----------------|--------|-----------------|---------------------|-------|
|-----------------|--------|-----------------|---------------------|-------|

### Current - Conducting State Maximums

|                              |          |                                                |     |       |
|------------------------------|----------|------------------------------------------------|-----|-------|
| Forward Voltage Drop         | $V_{FM}$ | $T_j = 25^\circ\text{C}, I_{FM} = 450\text{A}$ | 4.5 | Volts |
| Typical Forward Voltage Drop | $V_{FM}$ | $T_j = 25^\circ\text{C}, I_{FM} = 100\text{A}$ | 2.7 | Volts |

### Voltage - Blocking State Maximums

|                                                 |           |                                         |      |       |
|-------------------------------------------------|-----------|-----------------------------------------|------|-------|
| Repetitive Peak Reverse Voltage (Rated Limit)   | $V_{RRM}$ |                                         | 1200 | Volts |
| Non-rep. Trans. Peak Rev. Voltage (Rated Limit) | $V_{RSM}$ | $V \leq 5.0\text{msec}$                 | 1400 | Volts |
| Reverse Leakage Current, mA peak                | $I_{RRM}$ | $T_j$ at max., $V_{RRM} = \text{Rated}$ | 45   | mA    |

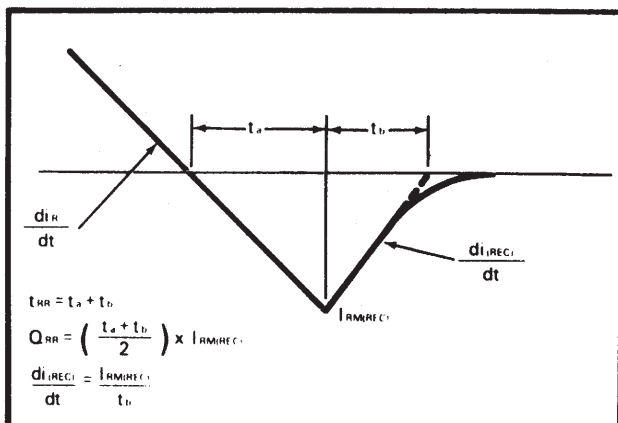
### Switching

|                               |          |                                                                                                                 |     |      |
|-------------------------------|----------|-----------------------------------------------------------------------------------------------------------------|-----|------|
| Maximum Reverse Recovery Time | $t_{rr}$ | $I_{FM} = 314\text{A}, t_p = 40\mu\text{sec},$<br>$di_F/dt = 25\text{A}/\mu\text{sec}, T_C = 25^\circ\text{C}$  | 300 | nsec |
| Maximum Reverse Recovery Time | $t_{rr}$ | $I_{FM} = 314\text{A}, t_p = 40\mu\text{sec},$<br>$di_F/dt = 25\text{A}/\mu\text{sec}, T_C = 150^\circ\text{C}$ | 650 | nsec |

### Thermal

|                                               |                   |      |         |
|-----------------------------------------------|-------------------|------|---------|
| Maximum Resistance, Junction to Case          | $R_{\theta(j-c)}$ | 0.28 | °C/Watt |
| Maximum Resistance, Case to Sink (Lubricated) | $R_{\theta(c-s)}$ | 0.12 | °C/Watt |

Reverse Recovery Wave Form



Transient Thermal Impedance Vs. Time

