

**QR\_1220T30**  
**Fast Recovery Diode Module**

#### Description:

Powerex Fast Recovery Diode Modules are designed for use in applications requiring fast switching. The modules are isolated for easy mounting with other components on a common heatsink.

#### Features:

- Fast Recovery Time
- Isolated Mounting
- Metal Baseplate
- Low Thermal Impedance
- 3000 V isolating voltage

#### Applications:

- Switching Power Supplies
- Inverters
- Choppers
- Welding Power Supplies
- Free Wheeling Diode
- High Frequency Rectifiers

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| A          | 3.70       | 94.0        |
| B          | 1.34       | 34.0        |
| C          | 1.18       | 30.0        |
| D          | 3.15       | 80.0        |
| E          | 0.50       | 12.7        |
| F          | 0.28       | 7.0         |
| G          | 0.67       | 17.0        |
| H          | 0.91       | 23.0        |
| J          | 0.91       | 23.0        |
| K          | M6X1.0     | M6X1.0      |
| L          | 0.31       | 8.0         |
| M          | 0.256 Dia. | 6.5 Dia.    |
| N          | 0.47       | 12.0        |

**Absolute Maximum Ratings,  $T_J=25^\circ\text{C}$  unless otherwise specified**

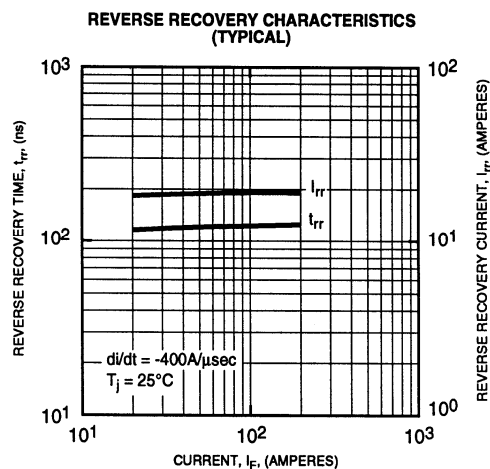
| Characteristics                              | Conditions  | Symbol      | QRD1220T30      | QRC1220T30 | Units                  |
|--|---|-------------|-----------------|------------|------------------------|
|  |   |             | QRF1220T30      |            |                        |
| Repetitive Peak Reverse Blocking Voltage     | -   | $V_{RRM}$   | 1200            |            | Volts                  |
| Non-Repetitive Peak Reverse Blocking Voltage | -   | $V_{RSM}$   | $V_{RRM} + 100$ |            | Volts                  |
| Average Forward Current                      | 180° Conduction, $T_c=80^\circ\text{C}$                     | $I_{F(AV)}$ | 99              |            | Amperes                |
|  | 180° Conduction, $T_c=25^\circ\text{C}$                     |             | 149             |            | Amperes                |
| Peak Half Cycle Non-Repetitive Surge Current | $t = 8.3\text{mS}$ , 100% $V_{RRM}$ Reapplied               | $I_{FSM}$   | 1670            |            | Amperes                |
| $I^2t$ for Fusing for One Cycle              | $t = 8.3\text{mS}$ , 100% $V_{RRM}$ Reapplied               | $I^2t$      | 11620           |            | $\text{A}^2\text{sec}$ |
| Operating Junction Temperature               | -   | $T_J$       | -40 to 150      |            | $^\circ\text{C}$       |
| Storage Temperature                          | -   | $T_{STG}$   | -40 to 150      |            | $^\circ\text{C}$       |
| Maximum Mounting Torque, M6 Mounting Screw   | -   | -           | 26              |            | In.-lb.                |
| Maximum Terminal Torque, M6 Terminal Screw   | -   | -           | 26              |            | In.-lb.                |
| Module Weight (Typical)                      | -   | -           | 220             |            | Grams                  |
| V Isolation                                  | 60 Hz, circuit to base, all terminals shorted, $t = 60$ sec | $V_{RMS}$   | 3000            |            | Volts                  |

**Thermal Characteristics,  $T_J=25^\circ\text{C}$  unless otherwise specified**

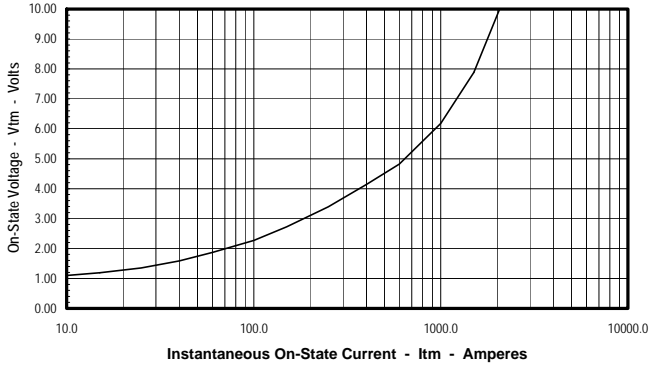
| Characteristics                             | Symbol          |            | Min. | Typ. | Max. | Units                 |
|---|-----------------|------------|------|------|------|-----------------------|
| Thermal Resistance, Junction to Case        | $R_{\theta JC}$ | Per Diode  | -    | -    | 0.18 | $^\circ\text{C/Watt}$ |
| Thermal Resistance, Case to Sink Lubricated | $R_{\theta CS}$ | Per Module | -    | -    | 0.04 | $^\circ\text{C/Watt}$ |

**Electrical Characteristics,  $T_J=25^\circ\text{C}$  unless otherwise specified**

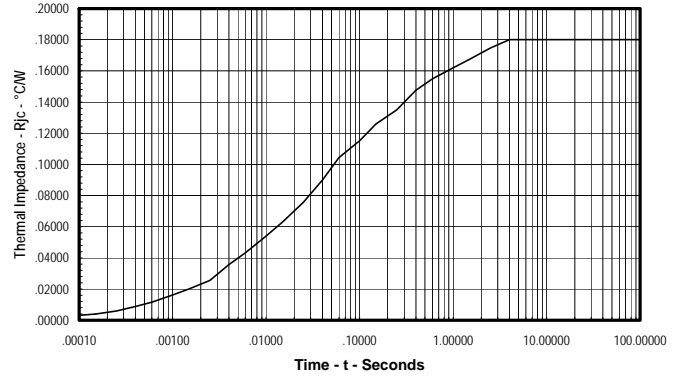
| Characteristics              | Symbol    | Test Conditions  | Min. | Typ. | Max. | Units         |
|------------------------------|-----------|--|------|------|------|---------------|
| Peak Reverse Leakage Current | $I_{RRM}$ | Rated $V_{RRM}$  | -    | -    | 1    | mA            |
| Peak On-State Voltage        | $V_{FM}$  | $I_F=200\text{A}$  | -    | -    | 3.5  | Volts         |
| Reverse Recovery Time        | $t_{rr}$  | $I_F = 200\text{A}$ , $di/dt = -400\text{A}/\mu\text{s}$ | -    | -    | 250  | ns            |
| Reverse Recovery Charge      | $Q_{rr}$  | $I_F = 200\text{A}$ , $di/dt = -400\text{A}/\mu\text{s}$ | -    | 1.49 | -    | $\mu\text{C}$ |



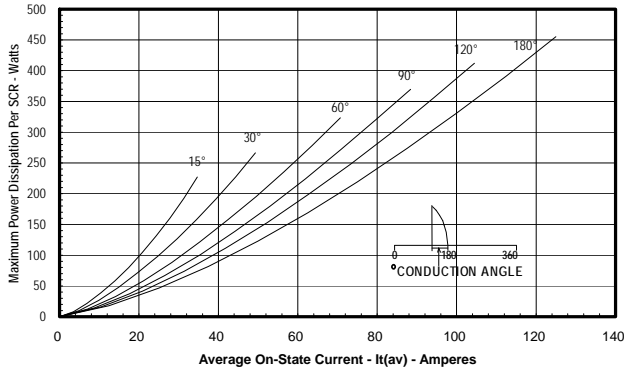
**Maximum On-State Forward Voltage Drop**  
( $T_j = 150^\circ\text{C}$ )



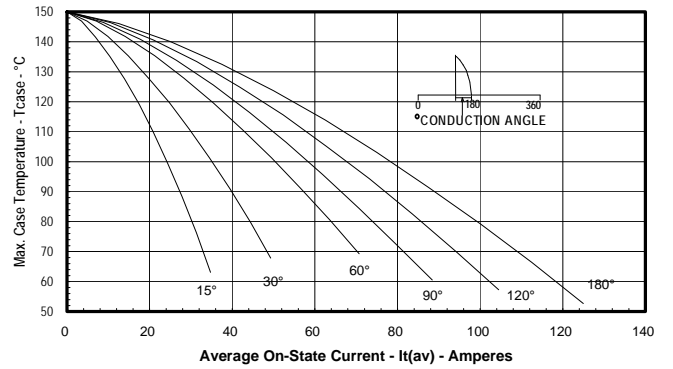
**Maximum Transient Thermal Impedance**  
(Junction to Case)



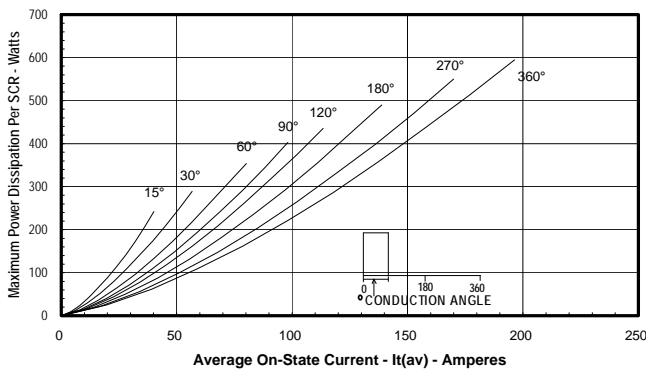
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
(Rectangular Waveform)



**Maximum Allowable Case Temperature**  
(Rectangular Waveform)

