

$I_{F(AV)} = 8 \text{ Amp}$   
 $V_R = 80 - 100V$

**Major Ratings and Characteristics**

| Characteristics                         | Value      | Units            |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform        | 8          | A                |
| $V_{RRM}$ range                         | 80 - 100   | V                |
| $I_{FSM}$ @tp = 5 $\mu$ s sine          | 850        | A                |
| $V_F$ @8 Apk, $T_J = 125^\circ\text{C}$ | 0.58       | V                |
| $T_J$ range                             | -55 to 175 | $^\circ\text{C}$ |

**Description/ Features**

The 8TQ...G Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

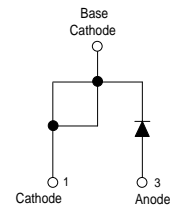
- 175° C  $T_J$  operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

**Case Styles**

8TQ...G



TO-220AC



## 8TQ...G Series

Preliminary Data Sheet PD-20686 09/04

International  
**IOR** Rectifier

### Voltage Ratings

| Part number                                     | 8TQ080G | 8TQ100G |
|---|---------|---------|
| $V_R$ Max. DC Reverse Voltage (V)               | 80      | 100     |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |         |         |

### Absolute Maximum Ratings

| Parameters  | 8TQ  | Units | Conditions   |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current<br>* See Fig. 5                | 8    | A     | 50% duty cycle @ $T_C = 157^\circ\text{C}$ , rectangular wave form   |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 850  | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse  |
|   | 230  |       | 10ms Sine or 6ms Rect. pulse   |
| $E_{AS}$ Non-Repetitive Avalanche Energy                                | 7.50 | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 0.50$ Amps, $L = 60$ mH   |
| $I_{AR}$ Repetitive Avalanche Current                                   | 0.50 | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical |

### Electrical Specifications

| Parameters  | 8TQ   | Units            | Conditions  |
|---|-------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (1)<br>* See Fig. 1    | 0.72  | V                | @ 8A  |
|   | 0.88  | V                | @ 16A   |
|   | 0.58  | V                | @ 8A  |
|   | 0.69  | V                | @ 16A   |
| $I_{RM}$ Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 0.28  | mA               | $T_J = 25^\circ\text{C}$  |
|   | 7     | mA               | $T_J = 125^\circ\text{C}$   |
| $C_T$ Max. Junction Capacitance                           | 500   | pF               | $V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance                           | 8     | nH               | Measured lead to lead 5mm from package body                           |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )        | 10000 | V/ $\mu\text{s}$ |   |

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

### Thermal-Mechanical Specifications

| Parameters  | 8TQ        | Units                     | Conditions                           |
|---|------------|---------------------------|--------------------------------------|
| $T_J$ Max. Junction Temperature Range                   | -55 to 175 | $^\circ\text{C}$          |                                      |
| $T_{stg}$ Max. Storage Temperature Range                | -55 to 175 | $^\circ\text{C}$          |                                      |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case     | 2.0        | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4            |
| $R_{thCS}$ Typical Thermal Resistance, Case to Heatsink | 0.50       | $^\circ\text{C}/\text{W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight                                   | 2 (0.07)   | g (oz.)                   |                                      |
| T Mounting Torque                                       | Min.       | 6 (5)                     | Kg-cm (lbf-in)                       |
|   | Max.       | 12 (10)                   |                                      |
| Device Marking  | 8TQ...G    |                           |                                      |

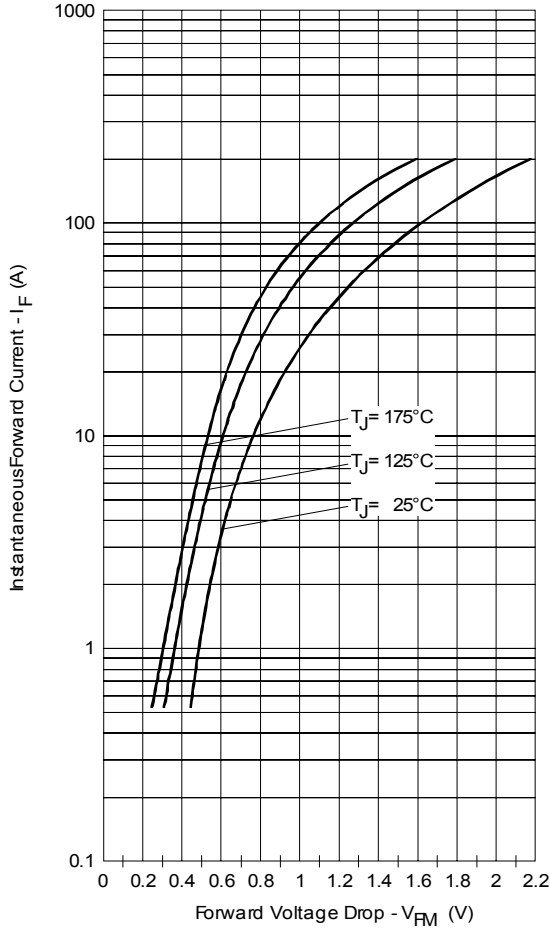


Fig. 1 - Maximum Forward Voltage Drop Characteristics

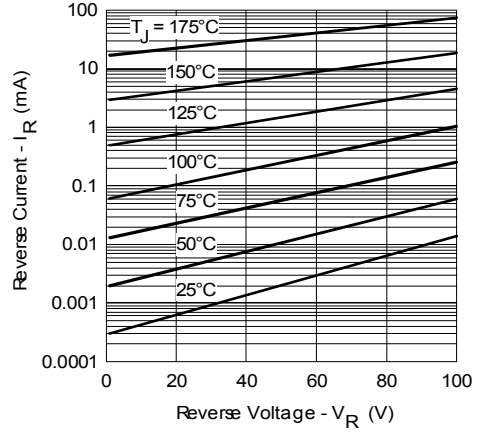


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

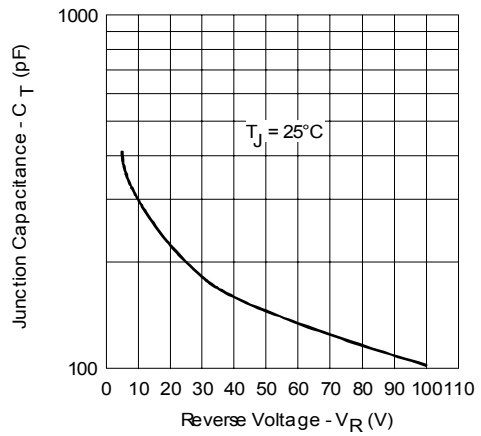


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

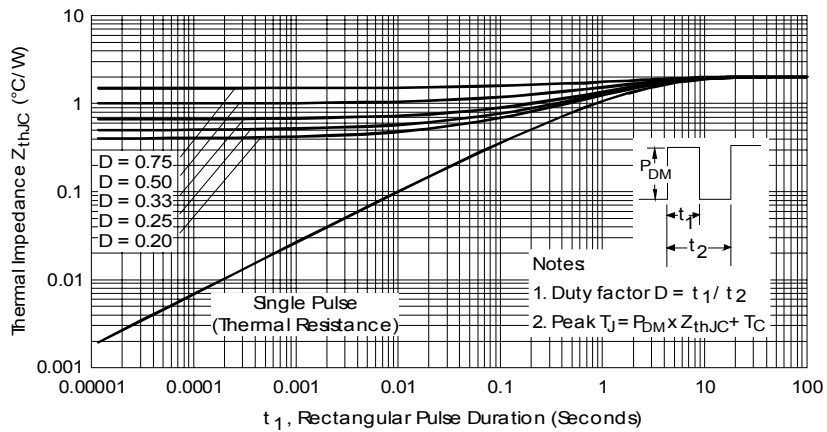


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

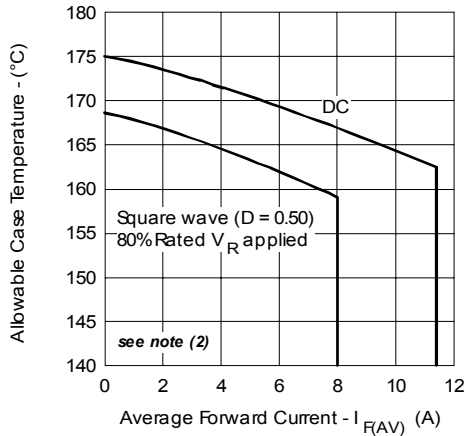


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

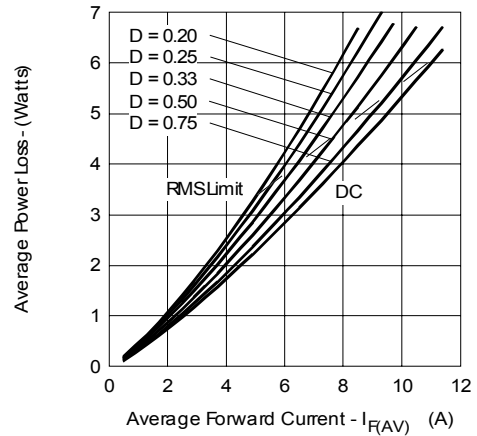


Fig. 6 - Forward Power Loss Characteristics

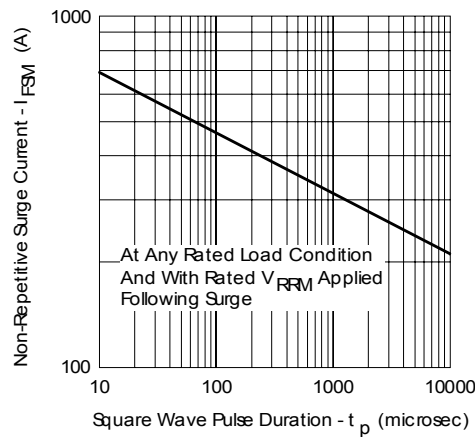


Fig. 7 - Maximum Non-Repetitive Surge Current

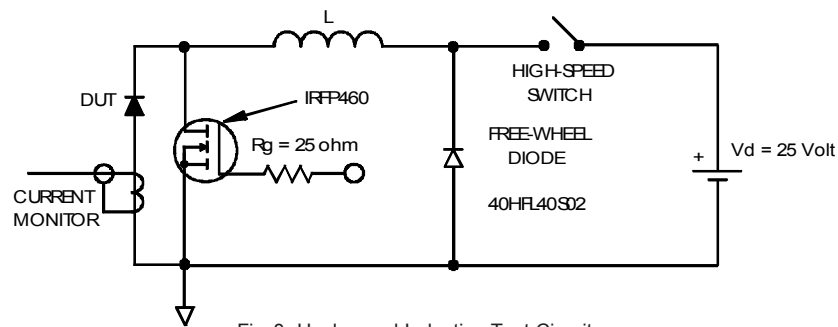


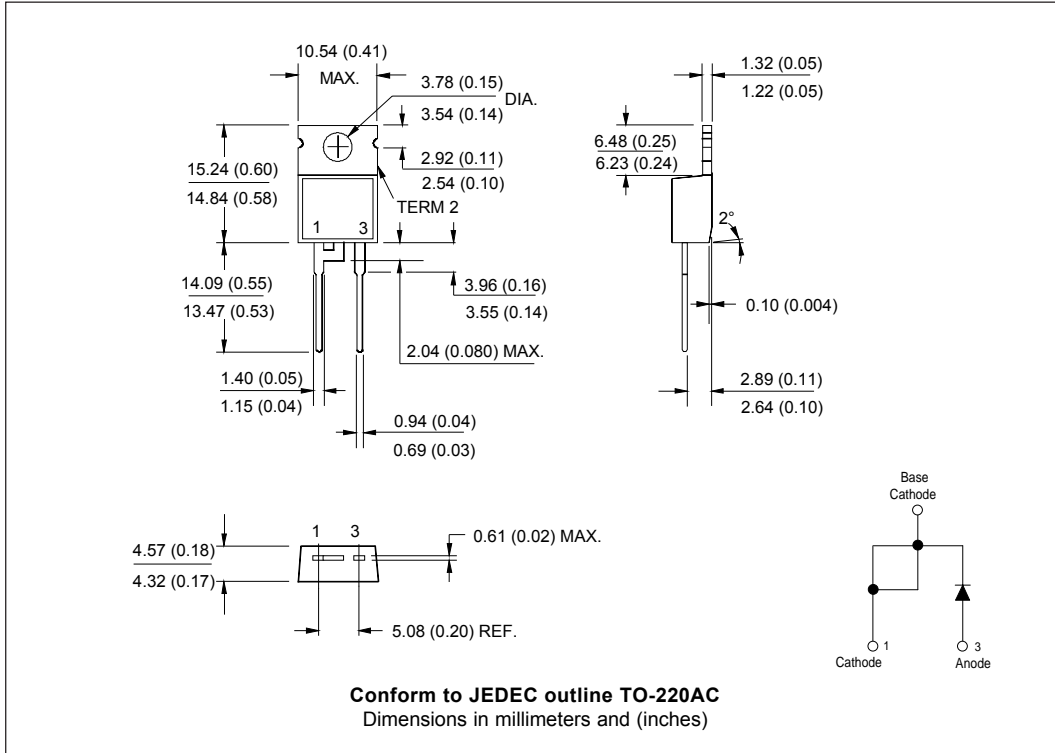
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used:  $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$ ;

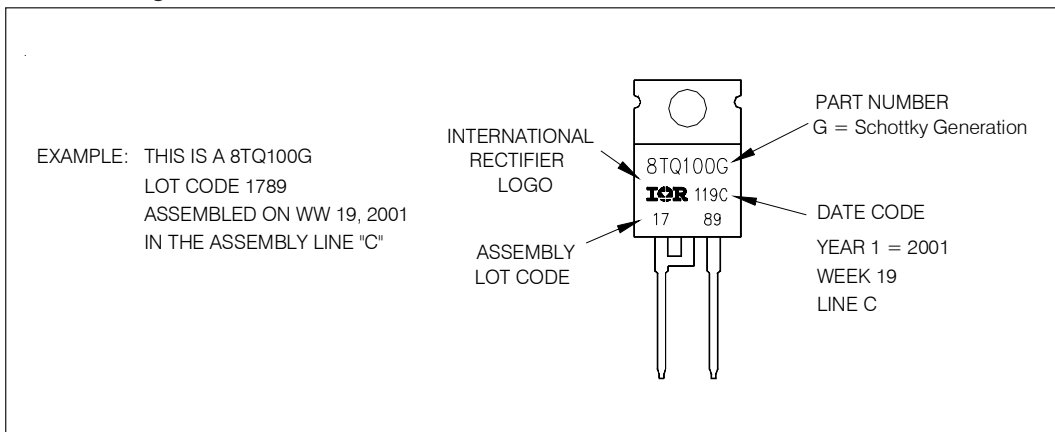
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$Pd_{REV}$  = Inverse Power Loss =  $V_{R1} \times I_{R1} (1 - D)$ ;  $I_{R1} @ V_{R1} = 80\%$  rated  $V_R$

Outline Table



Part Marking Information



Ordering Information Table

| Device Code |   |   |     |   |   |
|-------------|---|---|-----|---|---|
| 8           | T | Q | 100 | G | - |
| ①           | ② | ③ | ④   | ⑤ | ⑥ |

|  |  |
|--|--|
| <p><b>1</b> - Current Rating (8 = 8A)</p> <p><b>2</b> - T = TO-220</p> <p><b>3</b> - Q = Schottky Q Series</p> <p><b>4</b> - Voltage Ratings</p> <p><b>5</b> - G = Schottky Generation</p> <p><b>6</b> -</p> <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul> | <div style="border: 1px solid black; padding: 5px; display: inline-block;">                 080 = 80V<br/>                 100 = 100V             </div> |
|--|--|

Tube Standard Pack Quantity : 50 pieces

```

8TQ100
*****
* This model has been developed by *
* Wizard SPICE MODEL GENERATOR (1999) *
* (International Rectifier Corporation) *
* Contain Proprietary Information *
*****
* SPICE Model Diode is composed by a *
* simple diode plus paralalled VCG2T *
*****
.SUBCKT 8TQ100 ANO CAT
D1 ANO 1 DMOD (0.07089)
*Define diode model
.MODEL DMOD D(IS=1.15938021883115E-03A,N=1.95244918720315,BV=120V,
+ IBV=5.37891460505463A,RS= 0.00127602,CJO=9.9895753025115E-09,
+ VJ=2.30070034831946,XTI=2, EG=0.758916909331649)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=-90.2420977904848)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP(((1.635248E-02/-90.2421)*(V(2,CAT)*1E6)/(I(VX)+1E-6)-1))+1)*4.011038E-
03*ABS(V(ANO,CAT))-1}}
*****
.ENDS 8TQ100

Thermal Model Subcircuit
.SUBCKT 8TQ100 5 1

CTHERM1 5 4 1.45E+00
CTHERM2 4 3 4.54E+00
CTHERM3 3 2 1.09E+01
CTHERM4 2 1 1.01E+02

RTHERM1 5 4 2.49E+00
RTHERM2 4 3 5.20E-04
RTHERM1 3 2 5.43E-01
RTHERM1 2 1 3.05E-02

.ENDS 8TQ100
    
```

Data and specifications subject to change without notice.  
This product has been designed for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IOR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 09/04

## 8TQ...G Series

Preliminary Data Sheet PD-20686 09/04

---

International  
**IOR** Rectifier

Data and specifications subject to change without notice.  
This product has been designed for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IOR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 09/04

---