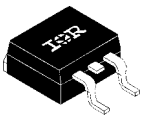
PD-20561 05/98

International
IOR Rectifier

# 8TQ...S SERIES

## SCHOTTKY RECTIFIER 8 Amp



**D²Pak (SMD-220)**

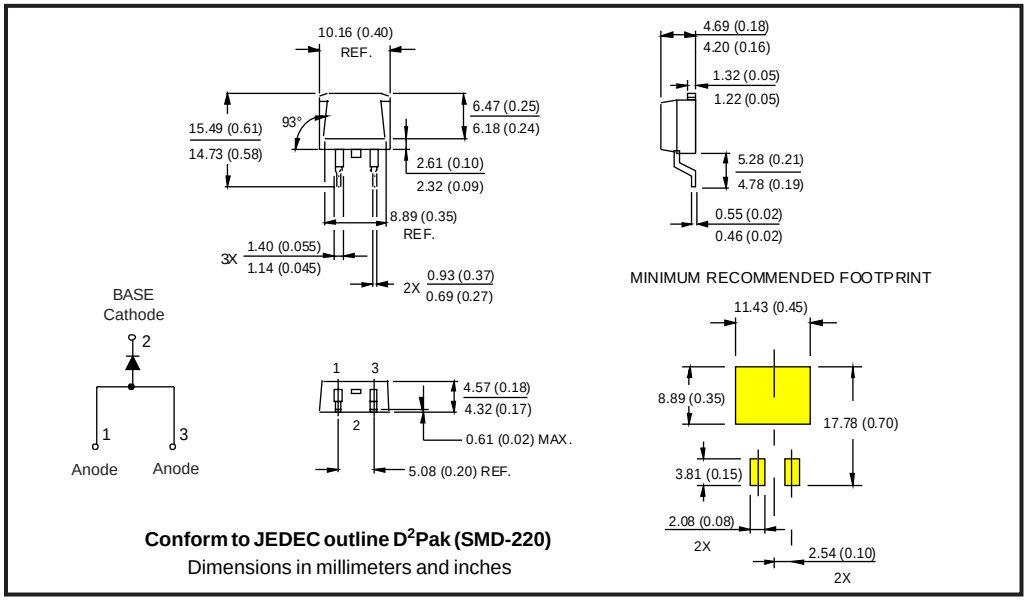
### Major Ratings and Characteristics

| Characteristics | | 8TQ...S | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 8 | A |
| $V_{RRM}$ | range | 80 to 100 | V |
| $I_{FSM}$ | @ tp = 5 µs sine | 850 | A |
| $V_F$ | @ 8 Apk, $T_J$ = 125°C | 0.58 | V |
| $T_J$ | range | -55 to 175 | °C |

### Description/Features

The 8TQ...S 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
- D²Pak (SMD-220) package
- 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




**Conform to JEDEC outline D²Pak (SMD-220)**
Dimensions in millimeters and inches

## Voltage Ratings

| | Part number | 8TQ080S | 8TQ100S |
|---|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | 80 | 100 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) | | |

## Absolute Maximum Ratings

| | Parameters | 8TQ...S | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current * See Fig. 5 | 8 | A | 50% duty cycle @ $T_C$ = 159° C, rectangular wave form | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 850 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | 230 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy | 7.50 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 0.50 Amps, L = 60 mH | |
| $I_{AR}$ | Repetitive Avalanche Current | 0.50 | A | Current decaying linearly to zero in 1 µsec<br>Frequency limited by $T_J$ max. $V_A$ = 1.5 x $V_R$ typical | |

## Electrical Specifications

| | Parameters | 8TQ...S | Units | Conditions | |
|---|---|---|---|---|---|
| $V_{FM}$ | Max. Forward Voltage Drop (1)<br>* See Fig. 1 | 0.72 | V | @ 8A | $T_J$ = 25 °C |
| | | 0.88 | V | @ 16A | |
| | | 0.58 | V | @ 8A | $T_J$ = 125 °C |
| | | 0.69 | V | @ 16A | |
| $I_{RM}$ | Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 0.55 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | 7 | mA | $T_J$ = 125 °C | |
| $V_{F(TO)}$ | Threshold Voltage | 404 | V | $T_J$ = $T_J$ max. | |
| $r_t$ | Forward Slope Resistance | 10.89 | mΩ | | |
| $C_T$ | Max. Junction Capacitance | 500 | pF | $V_R$ = 5$V_{DC}$, (test signal range 100Khz to 1Mhz) 25 °C | |
| $L_S$ | Typical Series Inductance | 8 | nH | Measured lead to lead 5mm from package body | |
| dv/dt | Max. Voltage Rate of Change (Rated $V_R$) | 10,000 | V/ µs | | |

(1) Pulse Width < 300µs, Duty Cycle < 2%

## Thermal-Mechanical Specifications

| | Parameters | 8TQ...S | Units | Conditions |
|---|---|---|---|---|
| $T_J$ | Max. Junction Temperature Range | -55 to 175 | °C | |
| $T_{stg}$ | Max. Storage Temperature Range | -55 to 175 | °C | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case | 2.0 | °C/W | DC operation * See Fig. 4 |
| wt | Approximate Weight | 2 (0.07) | g (oz.) | |
| | Case Style | $D^2$Pak (SMD-220) | | JEDEC |

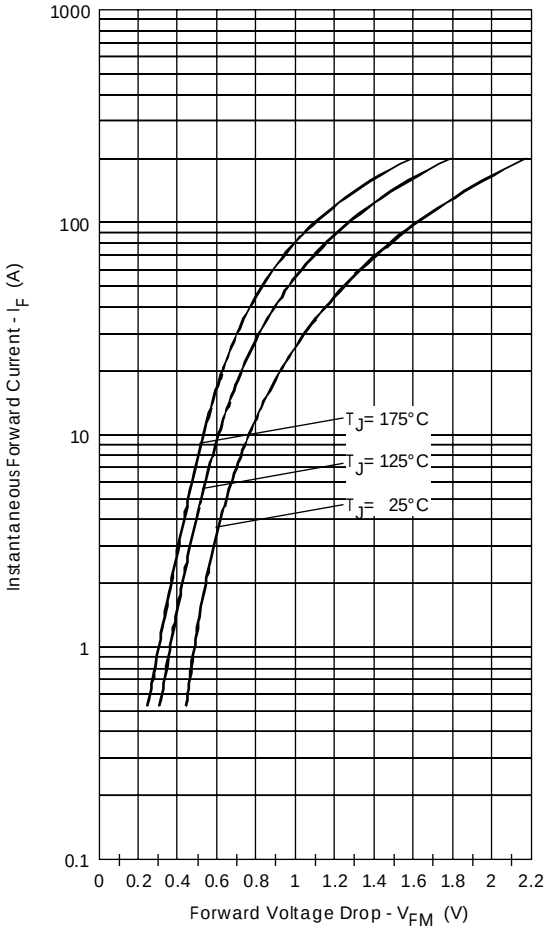



Fig. 1 - Maximum Forward Voltage Drop Characteristics

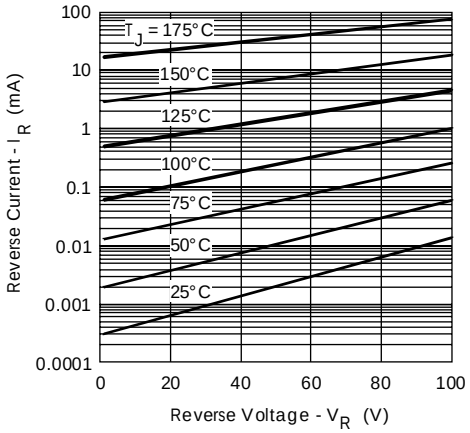



Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

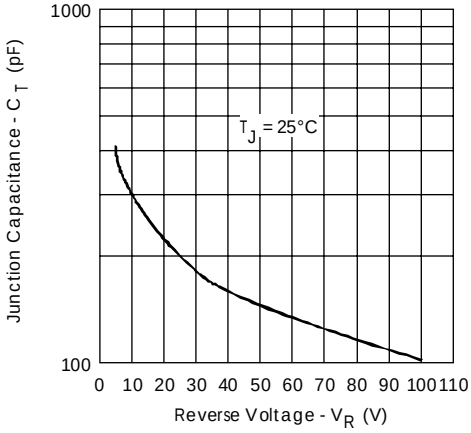



Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

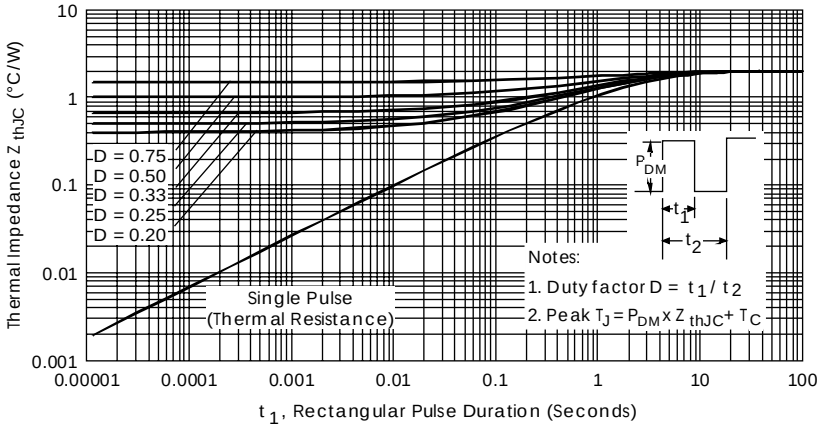



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics

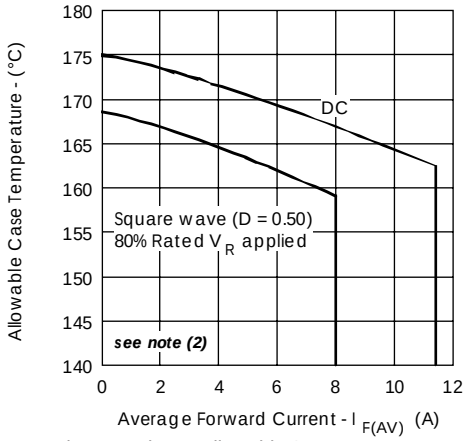



Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

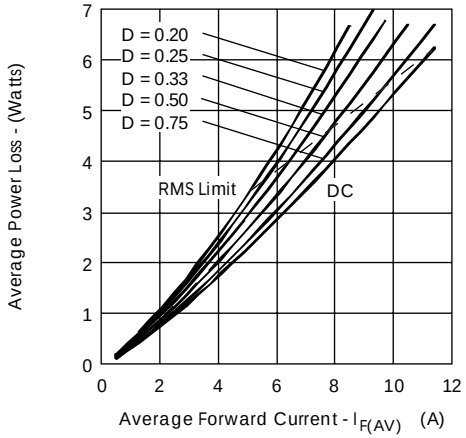



Fig. 6 - Forward Power Loss Characteristics

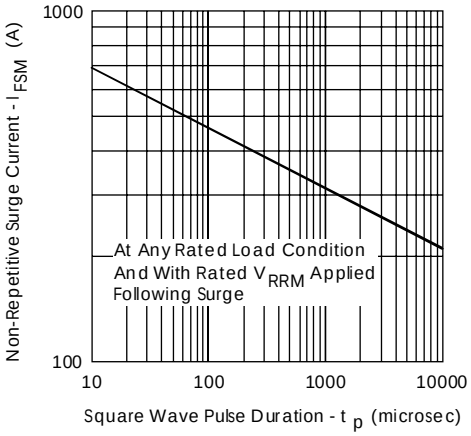



Fig. 7 - Maximum Non-Repetitive Surge Current

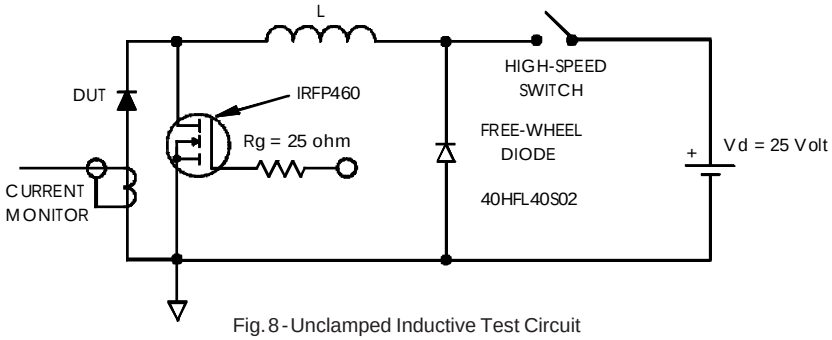
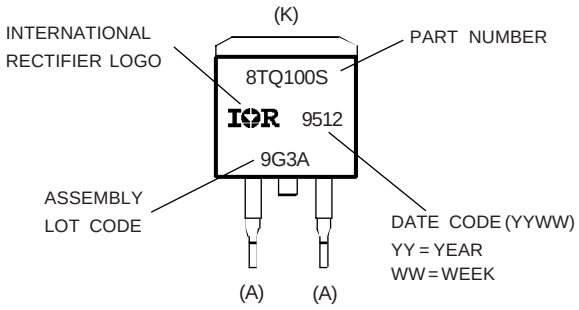



Fig. 8 - Unclamped Inductive Test Circuit

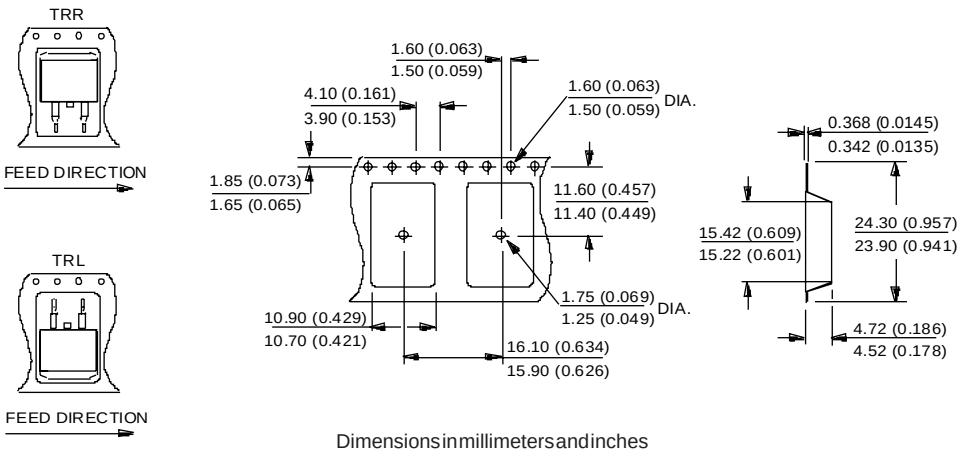
**(2)** Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$ ;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ ($I_{F(AV)}$ / D) (see Fig. 6);
$Pd_{REV}$ = Inverse Power Loss = $V_{R1} \times I_R$ (1 - D); $I_R$ @ $V_{R1}$ = 80% rated $V_R$

## Marking Information

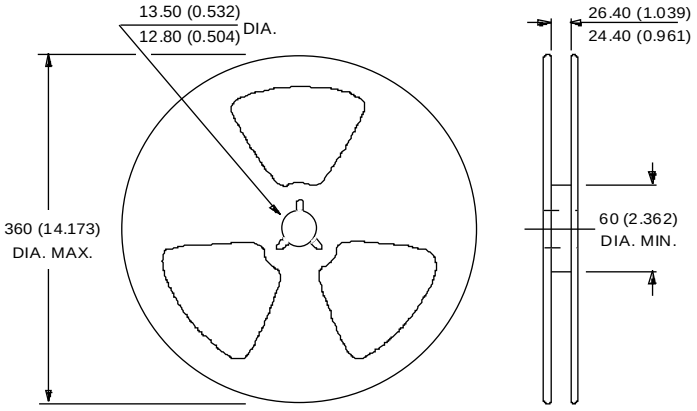
EXAMPLE: THIS IS AN 8TQ100S




## Tape & Reel Information




Dimensions in millimeters and inches




**SMD-220 Tape & Reel**

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.