

International  
**IR** Rectifier

8TQ...  
 8TQ...S

SCHOTTKY RECTIFIER

8 Amp

$$I_{F(AV)} = 8 \text{ Amp}$$

$$V_R = 80 - 100V$$

#### Major Ratings and Characteristics



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

- 175 $^\circ\text{C}$   $T_J$  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...	8TQ... S
 <p>TO-220</p>	 <p>D<sup>2</sup>PAK</p>

## 8TQ... Series

Bulletin PD-20561 rev. D 07/03

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### Voltage Ratings

Part number	8TQ080	8TQ100
$V_R$ 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 * 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 $\mu\text{sec}$ 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) * See Fig. 1	0.72	V	@ 8A $T_J = 25^\circ\text{C}$
	0.88	V	@ 16A
	0.58	V	@ 8A $T_J = 125^\circ\text{C}$
	0.69	V	@ 16A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	0.55	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)	

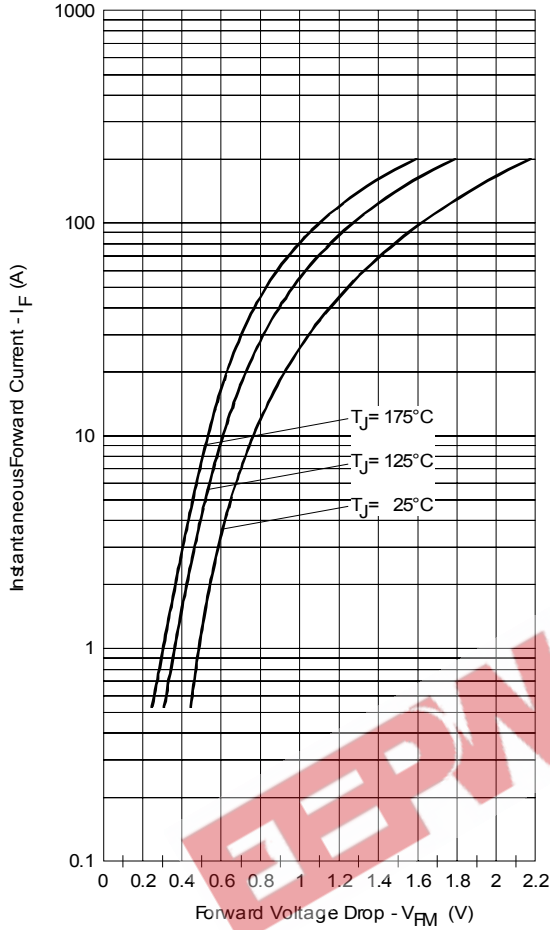


Fig. 1 - Maximum Forward Voltage Drop Characteristics

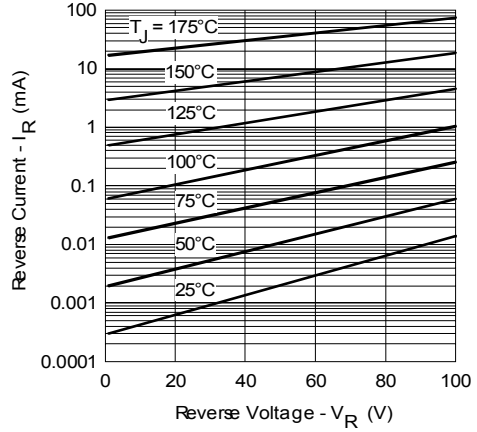


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

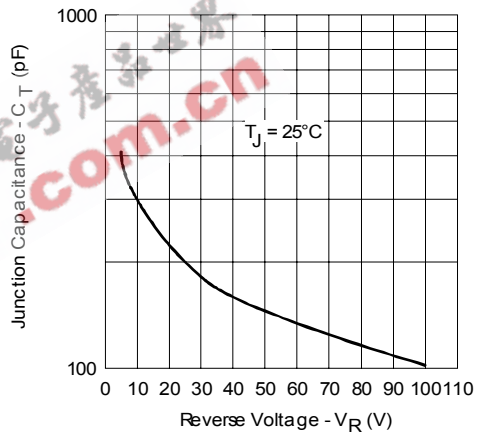


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

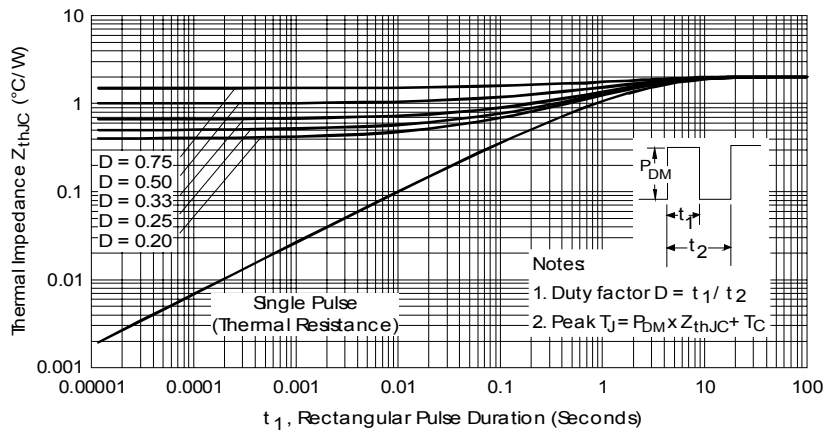


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

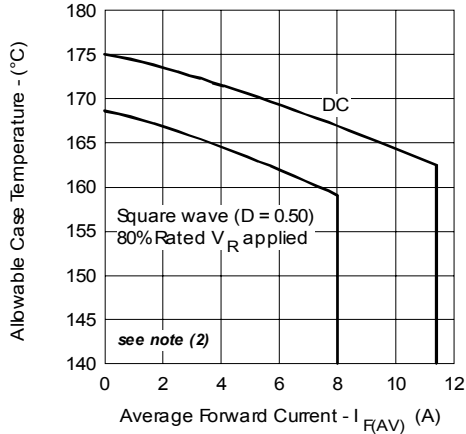


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

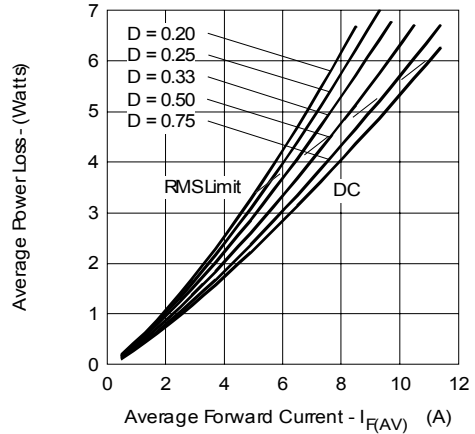


Fig. 6 - Forward Power Loss Characteristics

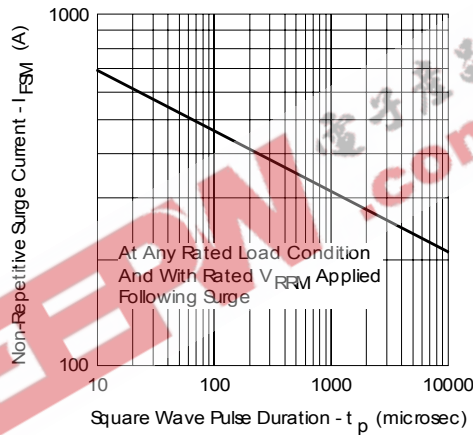


Fig. 7 - Maximum Non-Repetitive Surge Current

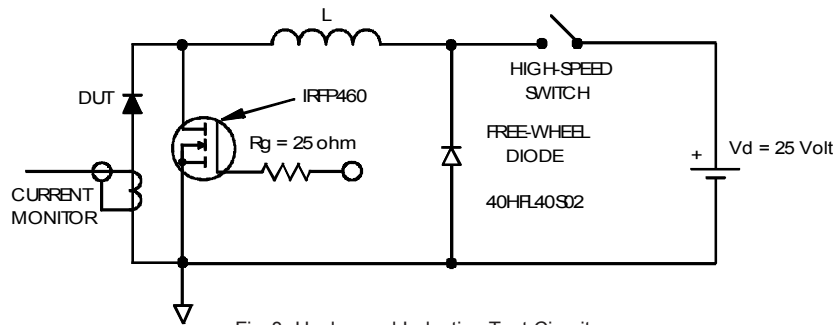


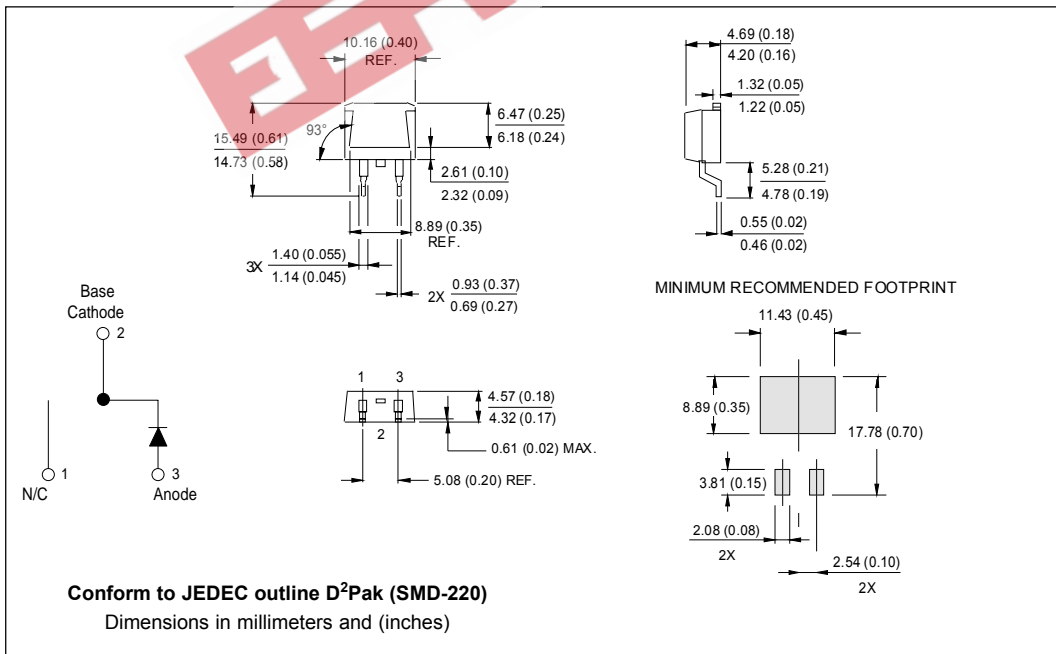
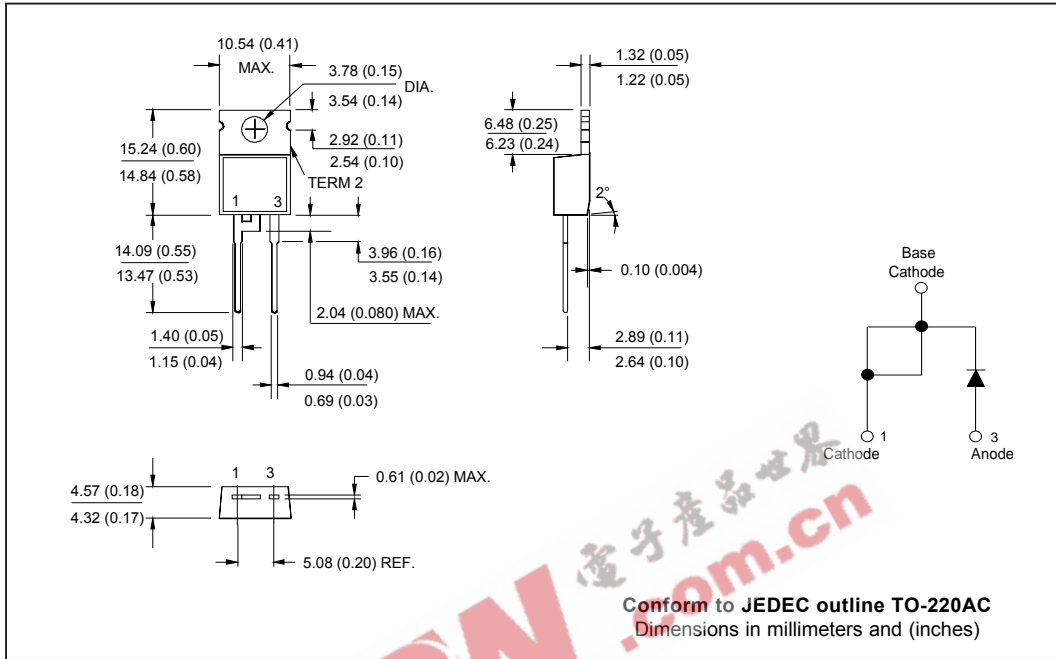
Fig. 8 - Unclamped Inductive Test Circuit

(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



Ordering Information Table

Device Code				
8	T	Q	100	S
①	②	③	④	⑤

<p><b>1</b> - Essential Part Number</p> <p><b>2</b> - T = TO-220</p> <p><b>3</b> - Q = Schottky Q Series</p> <p><b>4</b> - Voltage Rating</p> <p><b>5</b> - S = D<sup>2</sup>Pak</p>	<p>080 = 80V</p> <p>100 = 100V</p>
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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 paralled 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

R THERM1 5 4 2.49E+00
R THERM2 4 3 5.20E-04
R THERM1 3 2 5.43E-01
R THERM1 2 1 3.05E-02

.ENDS 8TQ100
    
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Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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