Bulletin PD-20561 rev. D 07/03

International
IOR Rectifier

8TQ...
8TQ...S

SCHOTTKY RECTIFIER

8 Amp

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

Major Ratings and Characteristics

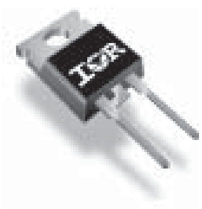
Characteristics		8TQ	Units
$I_{F(AV)}$	Rectangular waveform	8	A
V_{RRM}	range	80 - 100	V
I_{FSM}	@ tp = 5 μs sine	850	A
V_F	@ 8 Apk, T_J = 125°C	0.58	V
T_J	range	- 55 to 175	°C

Description/ Features

The 8TQ 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...	8TQ... S
	
TO-220	D^2PAK

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° C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	850	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	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 Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	8TQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.72	V	@ 8A	T_J = 25 °C
	* See Fig. 1	0.88	V	@ 16A	
		0.58	V	@ 8A	T_J = 125 °C
		0.69	V	@ 16A	
I_{RM}	Max. Reverse Leakage Current (1)	0.55	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2	7	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance	500	pF	V_R = 5V_{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)	10000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		8TQ	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
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface , smooth and greased
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (Ibf-in)	
		Max.	12 (10)		

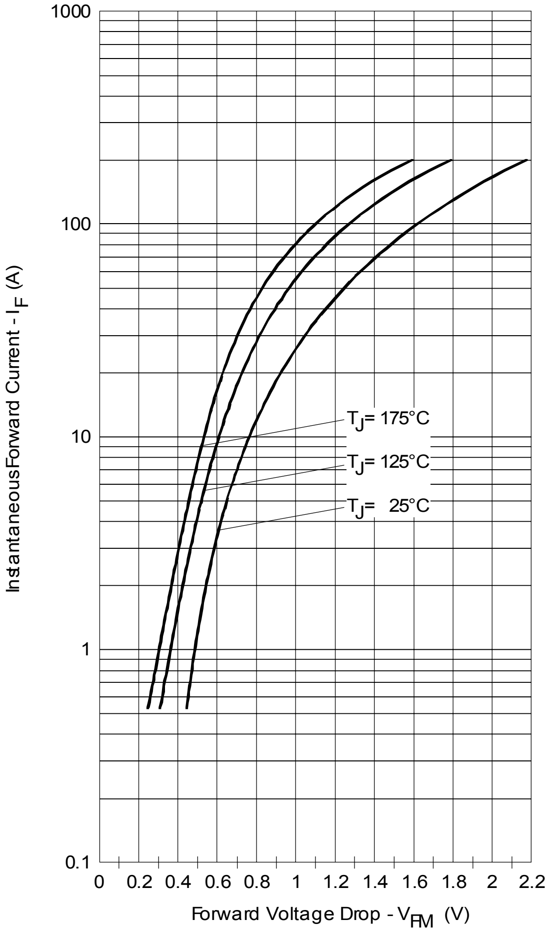


Fig. 1 - Maximum Forward Voltage Drop Characteristics

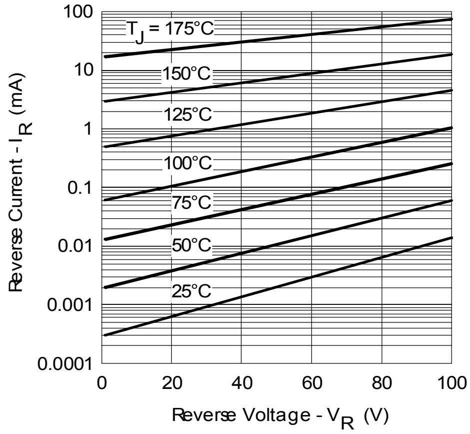


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

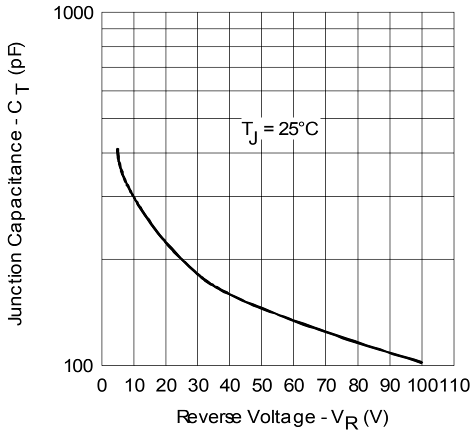


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

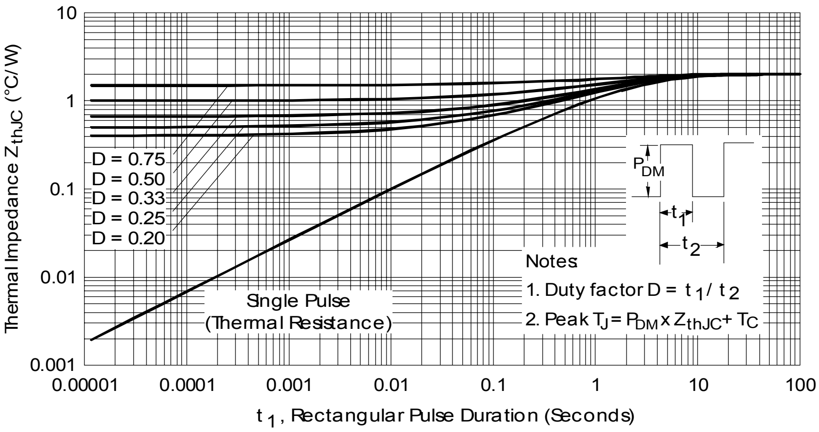


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

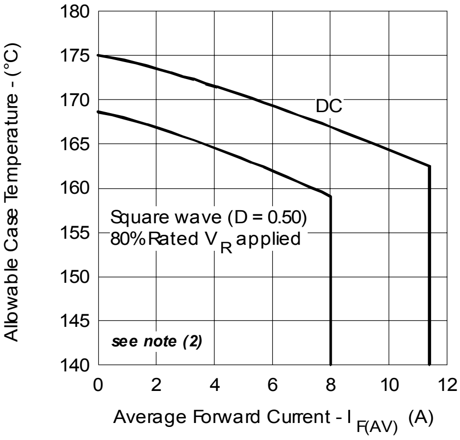


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

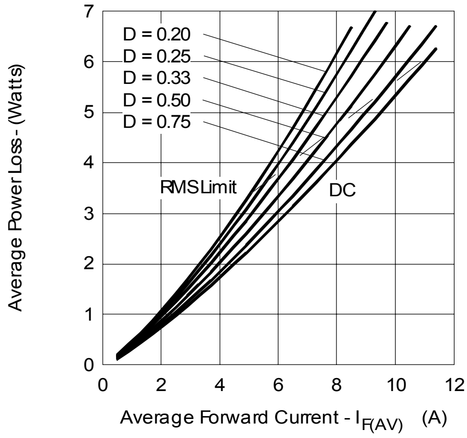


Fig. 6 - Forward Power Loss Characteristics

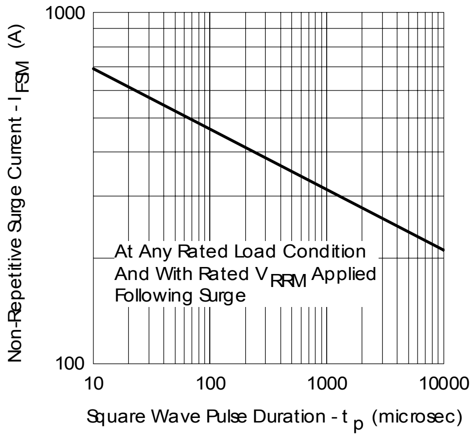


Fig. 7 - Maximum Non-Repetitive Surge Current

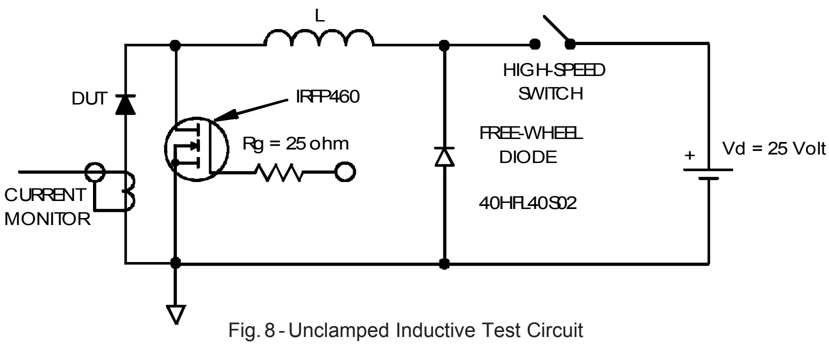
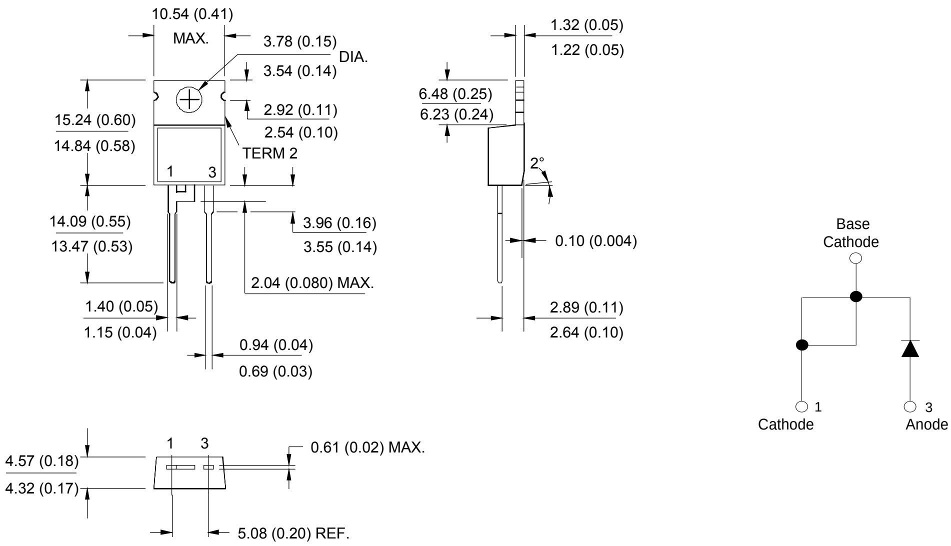


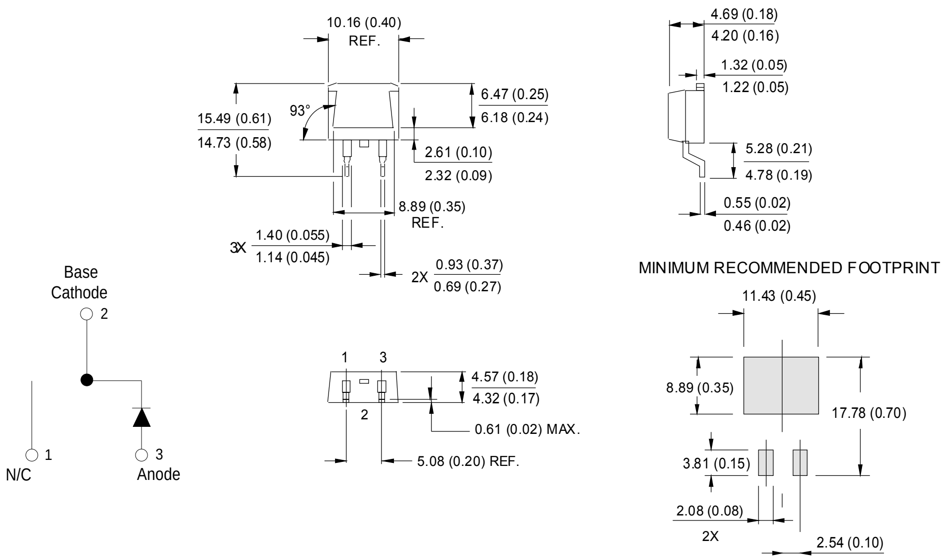
Fig. 8 - Unclamped Inductive Test Circuit

(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 = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

Outline Table



Conform to JEDEC outline TO-220AC
Dimensions in millimeters and (inches)



Conform to JEDEC outline D^2Pak (SMD-220)
Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

8	T	Q	100	S
1	2	3	4	5

1 - Essential Part Number
2 - T = TO-220
3 - Q = Schottky Q Series
4 - Voltage Rating (080 = 80V; 100 = 100V)
5 - S = D^2Pak

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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

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
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International
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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 for sales contact information. 07/03