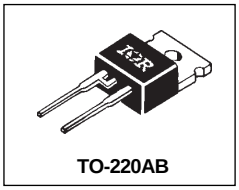
Preliminary Data Sheet PD-20563 07/98

International
IOR Rectifier

15TQ060

SCHOTTKY RECTIFIER

15 Amp



TO-220AB

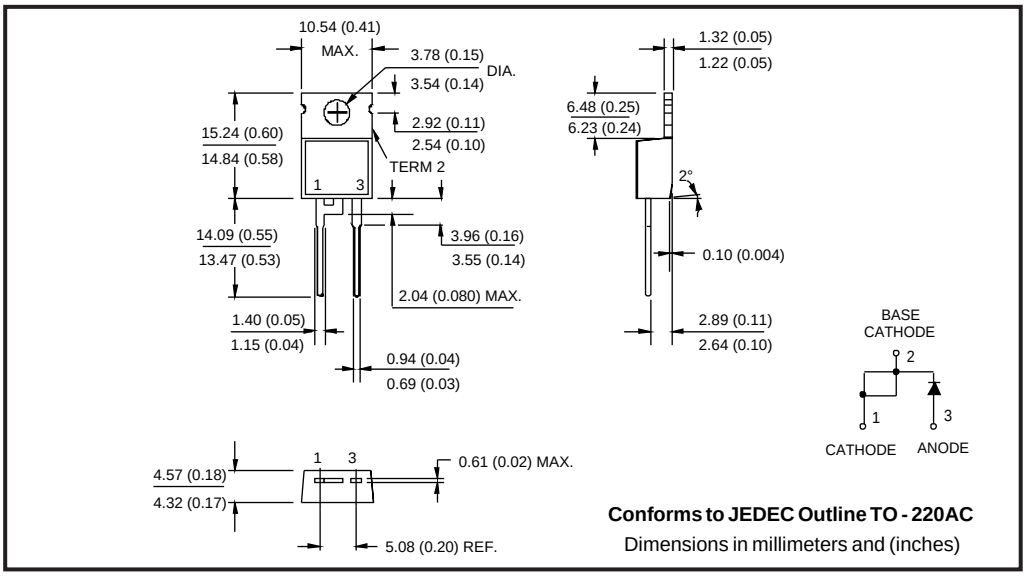
Major Ratings and Characteristics

Characteristics		15TQ060	Units
$I_{F(AV)}$	Rectangular waveform	15	A
V_{RRM}		60	V
I_{FSM}	@ tp = 5 µs sine	1000	A
V_F	@ 15 Apk, T_J = 125°C	0.56	V
T_J	range	-55 to 150	°C

Description/Features

The 15TQ060 Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



Conforms to JEDEC Outline TO - 220AC

Dimensions in millimeters and (inches)

Voltage Ratings

	Part number	15TQ060
V_R	Max. DC Reverse Voltage (V)	60
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	15TQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current *See Fig. 5	15	A	50% duty cycle @ T_C = 104°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current *See Fig. 7	1000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		260		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	13	mJ	T_J = 25 °C, I_{AS} = 1.50 Amps, L = 11.5 mH	
I_{AR}	Repetitive Avalanche Current	1.50	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	15TQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.62	V	@ 15A	T_J = 25 °C
		0.82	V	@ 30A	
		0.56	V	@ 15A	T_J = 125 °C
		0.71	V	@ 30A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	0.80	mA	T_J = 25 °C	V_R = rated V_R
		45	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.39	V	T_J = T_J max.	
r_t	Forward Slope Resistance	8.47	mΩ		
C_T	Max. Junction Capacitance	720	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25 °C	
L_S	Typical Series Inductance	8.0	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		15TQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case		3.25	°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 (lbf-in)	
		Max.	12(10)		
	Case Style		TO-220AC		JEDEC

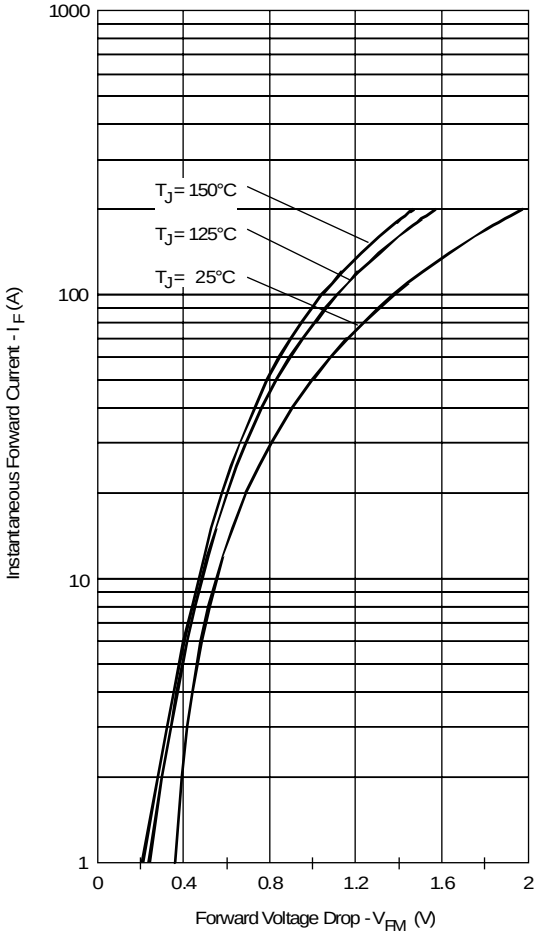


Fig. 1 - Maximum Forward Voltage Drop Characteristics

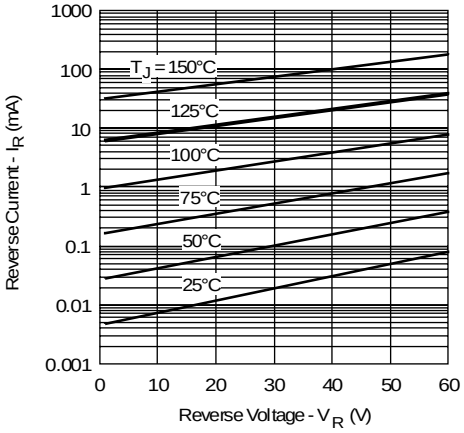


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

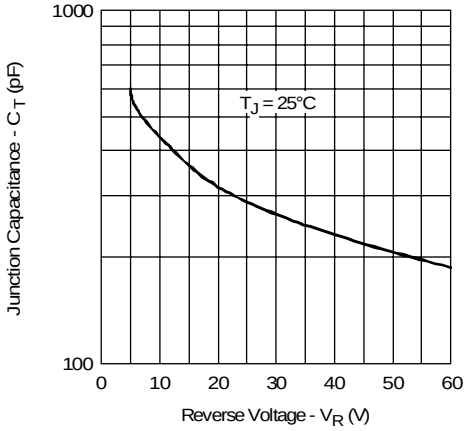


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

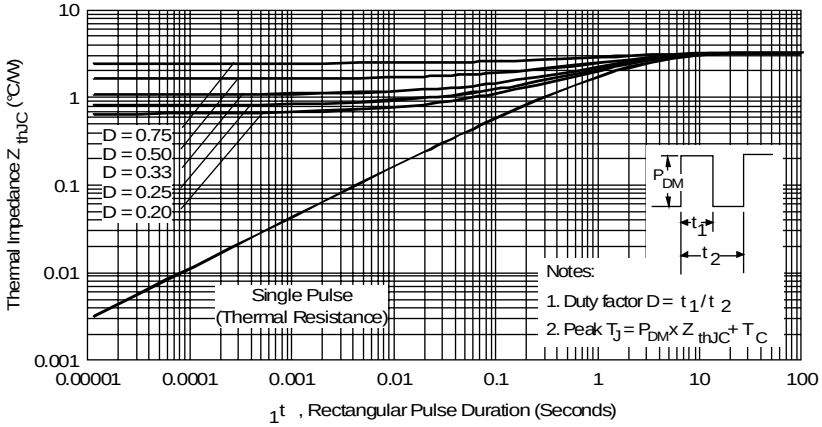


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

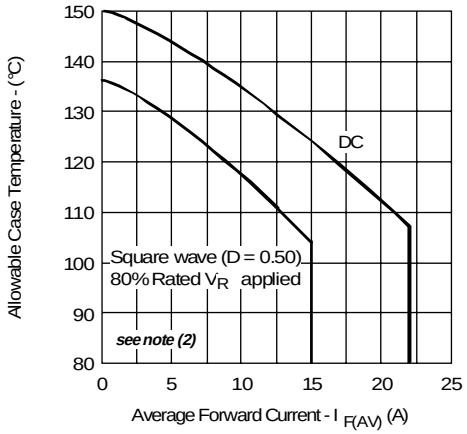


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

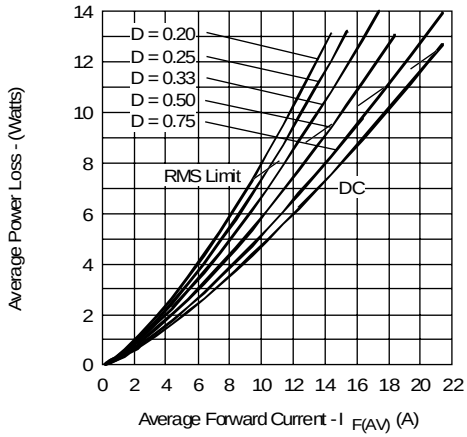


Fig. 6 - Forward Power Loss Characteristics

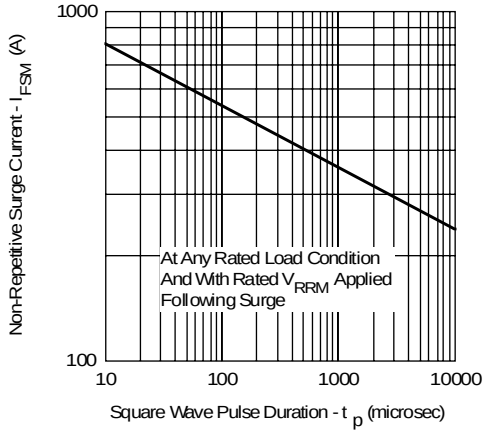


Fig. 7 - Maximum Non-Repetitive Surge Current

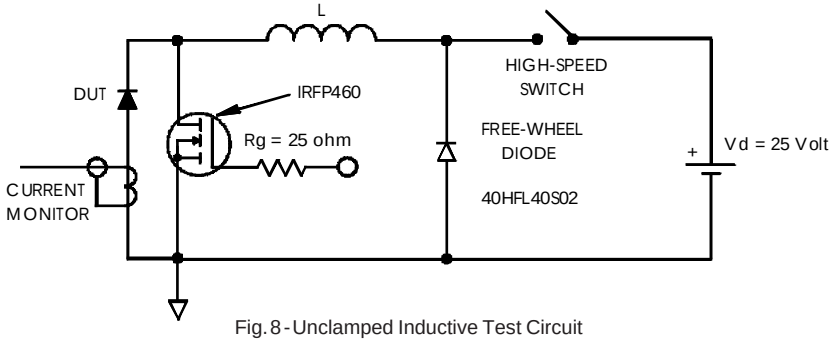


Fig. 8 - Unclamped Inductive Test Circuit

(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