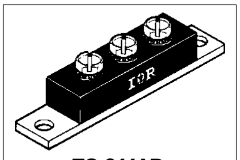
Bulletin PD-20580 rev. B 10/02

International Rectifier

203DNQ... SERIES

SCHOTTKY RECTIFIER

200 Amp



TO-244AB isolated doubler

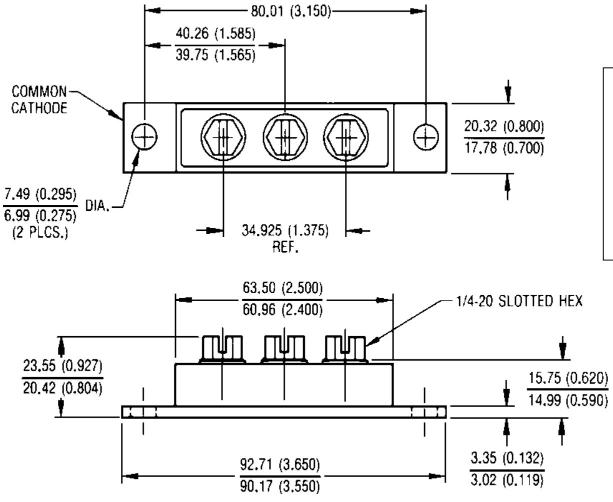
Major Ratings and Characteristics

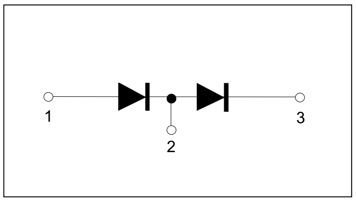
Characteristics	203DNQ...	Units
$I_{F(AV)}$ Rectangular waveform	200	A
V_{RRM} range	80 to 100	V
I_{FSM} @ tp = 5 µs sine	16,000	A
V_F @ 100Apk, T_J = 125°C (per leg)	0.70	V
T_J range	-55 to 175	°C

Description/ Features

The 203DNQ Schottky rectifier doubler module 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 high current switching power supplies, plating power supplies, UPS systems, converters, free-wheeling diodes, welding, 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





Modified JEDEC Outline TO-244AB

Dimensions in millimeters and (inches)

Voltage Ratings

	Part number	203DNQ080	203DNQ100
V_R	Max. DC Reverse Voltage (V)	80	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

	Parameters	203DNQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5 (Per Device)	200	A	50% duty cycle @ T_C = 136 °C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	16,000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		2,100		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	T_J = 25 °C, I_{AS} = 1 Amps, L = 30 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	1	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	203DNQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.86	V	@ 100A	T_J = 25 °C
		1.03	V	@ 200A	
		0.70	V	@ 100A	T_J = 125 °C
		0.84	V	@ 200A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	3	mA	T_J = 25 °C	V_R = rated V_R
		40	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.50	V	T_J = T_J max.	
r_t	Forward Slope Resistance	1.08	mΩ		
C_T	Max. Junction Capacitance (Per Leg)	2,650	pF	V_R = 5V_{DC} (test signal range 100KHz to 1MHz) 25°C	
L_S	Typical Series Inductance (Per Leg)	7.0	nH	From top of terminal hole to mounting plane	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		203DNQ	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 (Per Leg)		0.40	°C/W	DC operation * See Fig. 4
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.20	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.10	°C/W	Mounting surface, smooth and greased
wt	Approximate Weight		79 (2.80)	g (oz.)	
T	Mounting Torque	Min.	24 (20)	Kg-cm (Ibf-in)	
		Max.	35 (30)		
	Mounting Torque Center Hole	Typ.	13.5 (12)		
	Terminal Torque	Min.	35 (30)		
		Max.	46 (40)		
	Case Style		TO-244AB Isolated		Modified JEDEC

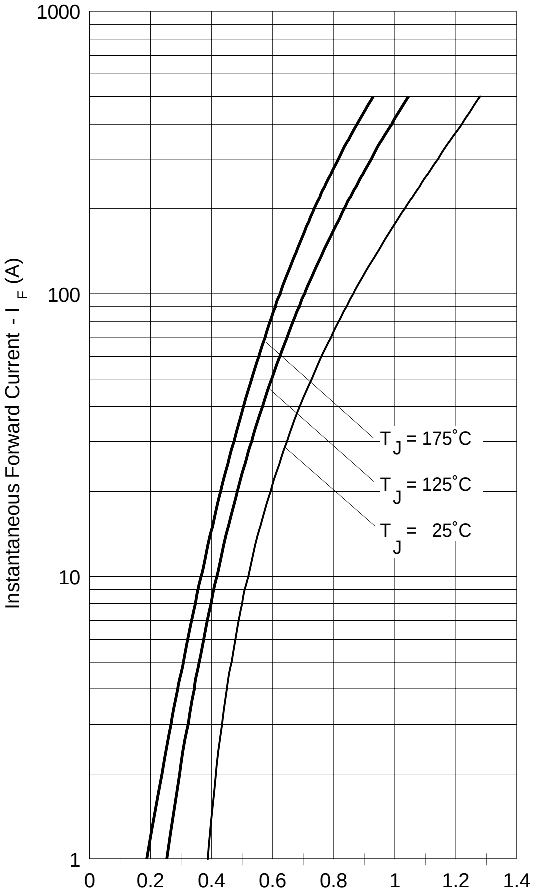


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

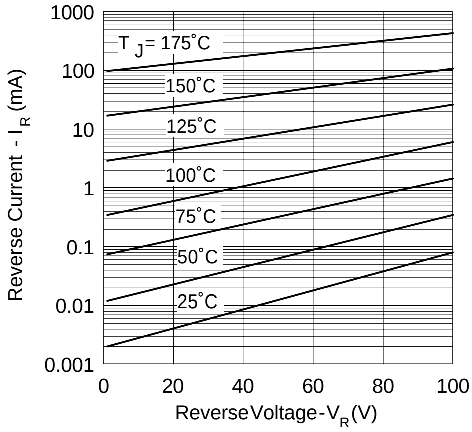


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

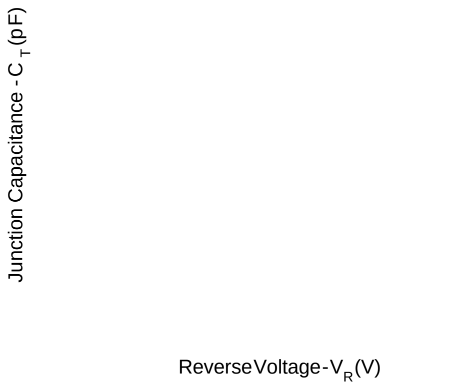


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

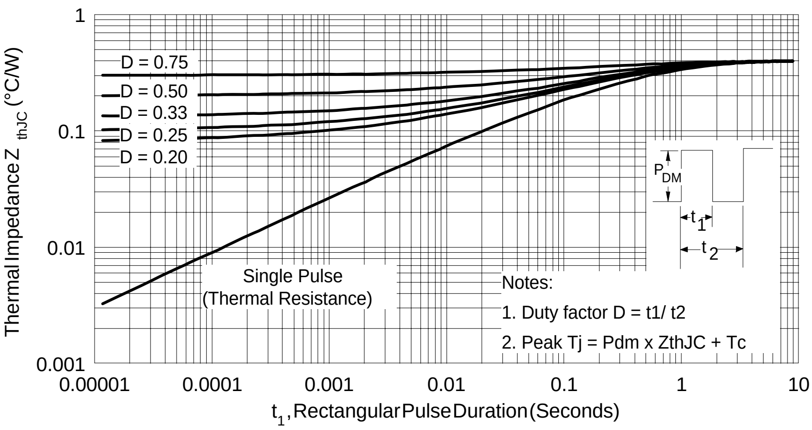


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

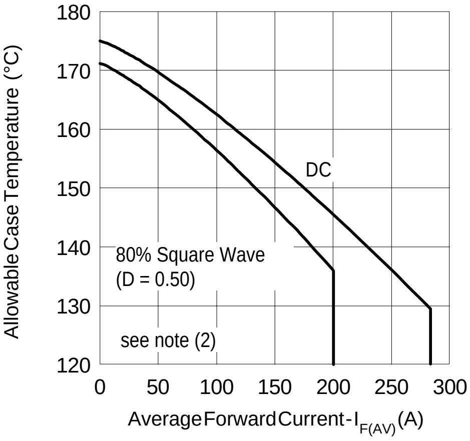


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

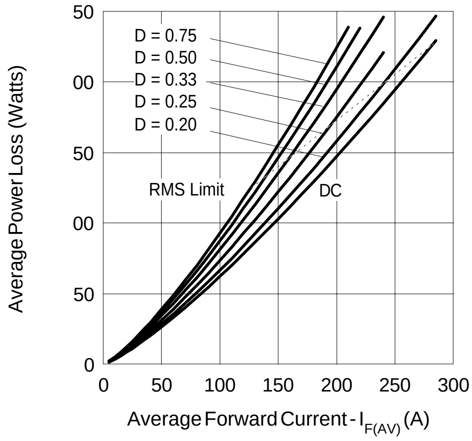


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

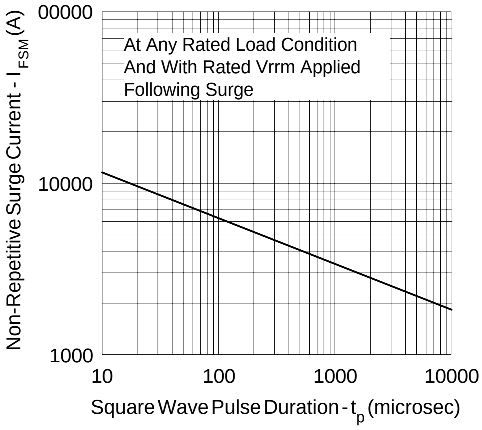


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

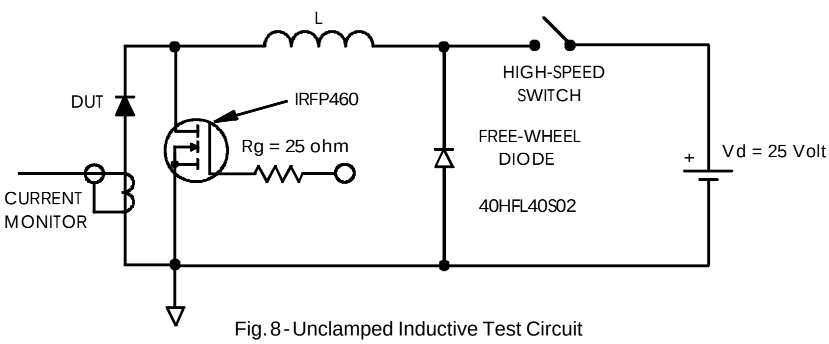


Fig. 8 - Unclamped Inductive Test Circuit

(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

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.

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