

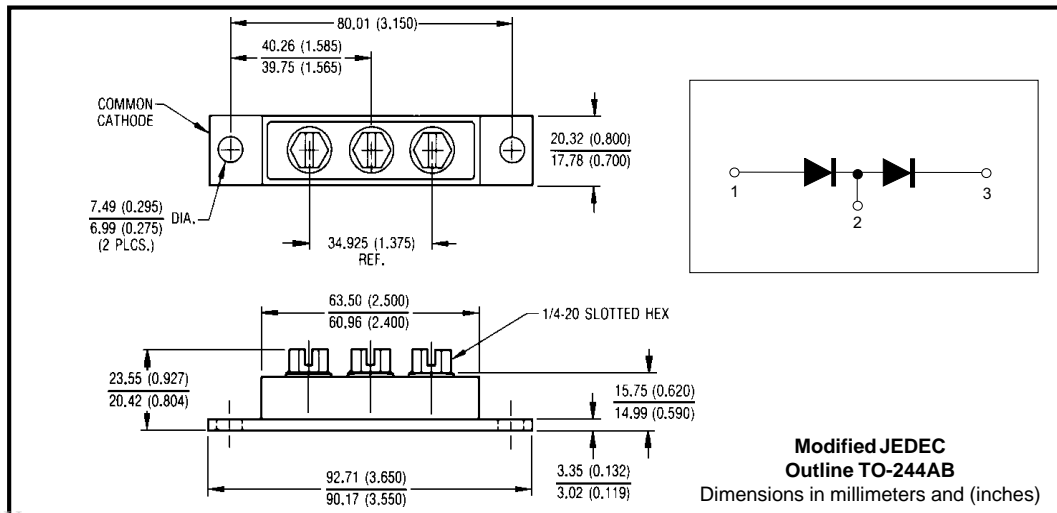
Major Ratings and Characteristics

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

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



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 @ $T_C = 136^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	16,000	A	5 μs Sine or 3 μs Rect. pulse
	2,100		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1$ 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. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	203DNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.86	V	@ 100A
	1.03	V	@ 200A
	0.70	V	@ 100A
	0.84	V	@ 200A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	3	mA	$T_J = 25^\circ\text{C}$
	40	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.50	V	$T_J = T_J$ max.
r_t Forward Slope Resistance	1.08	m Ω	
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 < 300 μs , Duty Cycle < 2%**Thermal-Mechanical Specifications**

Parameters	203DNQ	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 (Per Leg)	0.40	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.20	$^\circ\text{C}/\text{W}$	DC operation	
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.10	$^\circ\text{C}/\text{W}$	Mounting surface, smooth and greased	
wt Approximate Weight	79(2.80)	g(oz.)		
T Mounting Torque	Min.	24(20)	Kg-cm (lbf-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	

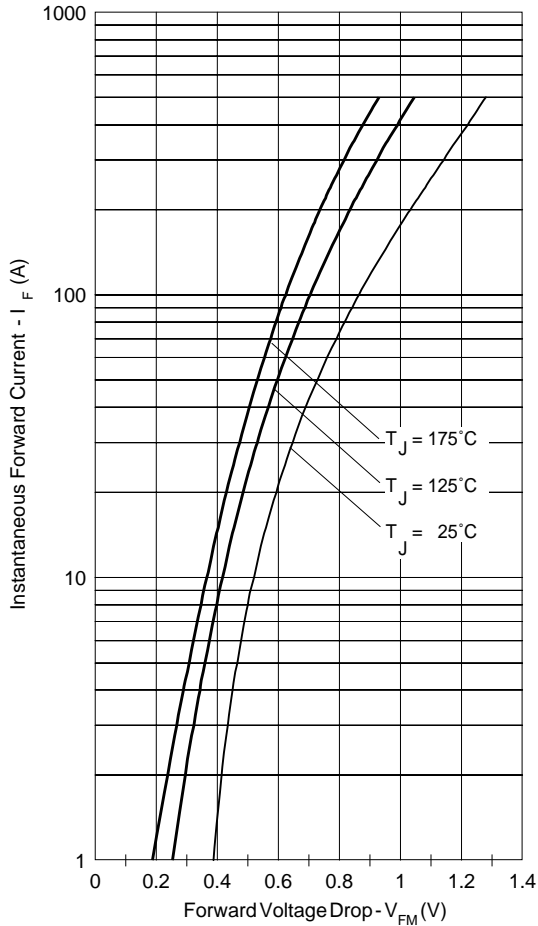


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

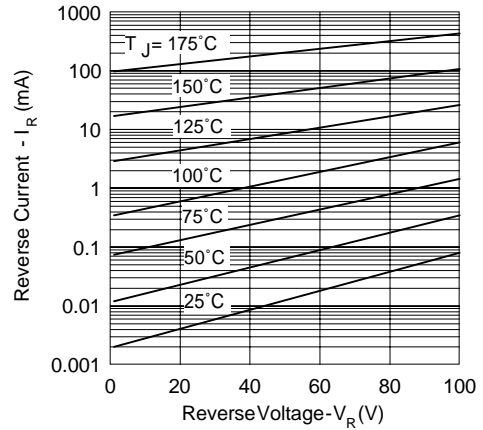


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

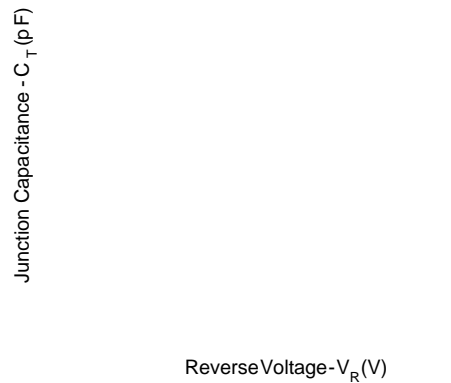


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

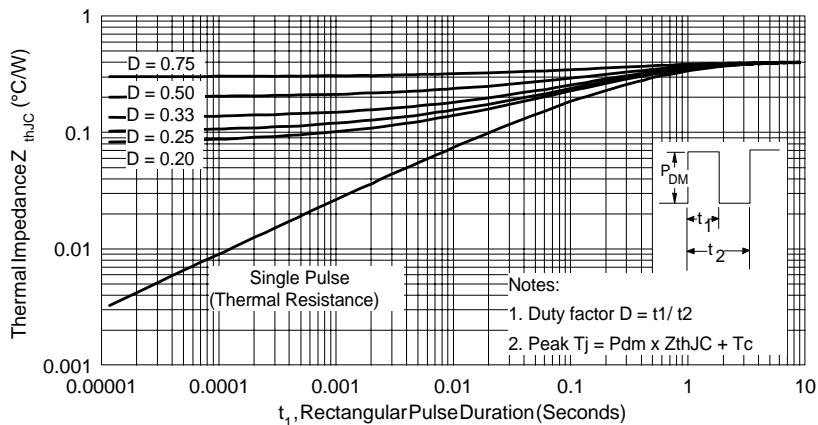


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

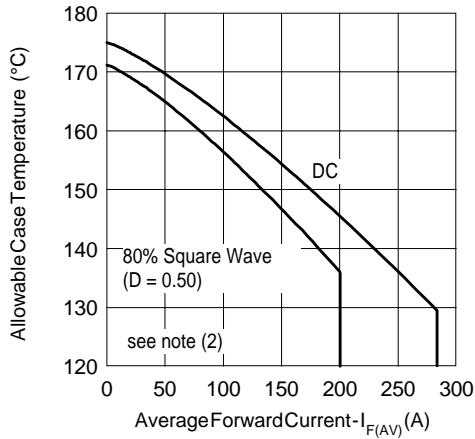


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

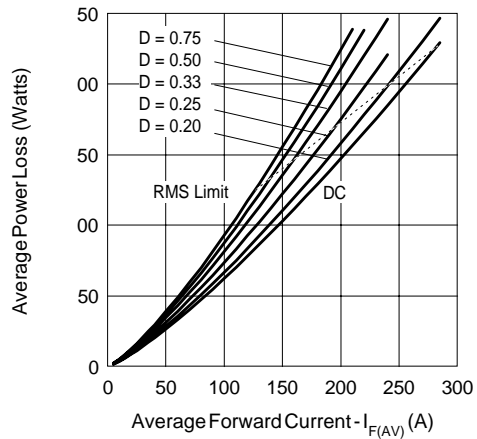


Fig. 6- Forward Power Loss Characteristics (Per Leg)

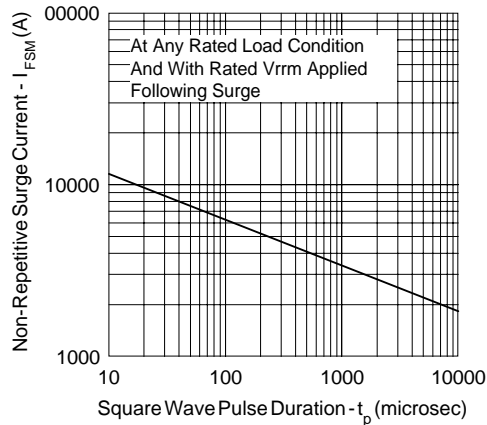


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

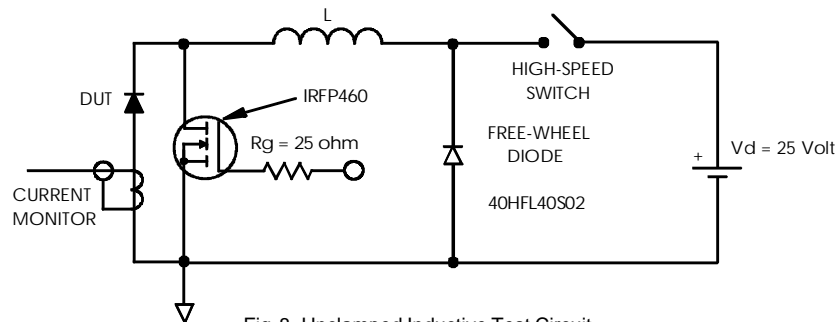


Fig. 8- Unclamped Inductive Test Circuit

(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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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309

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