

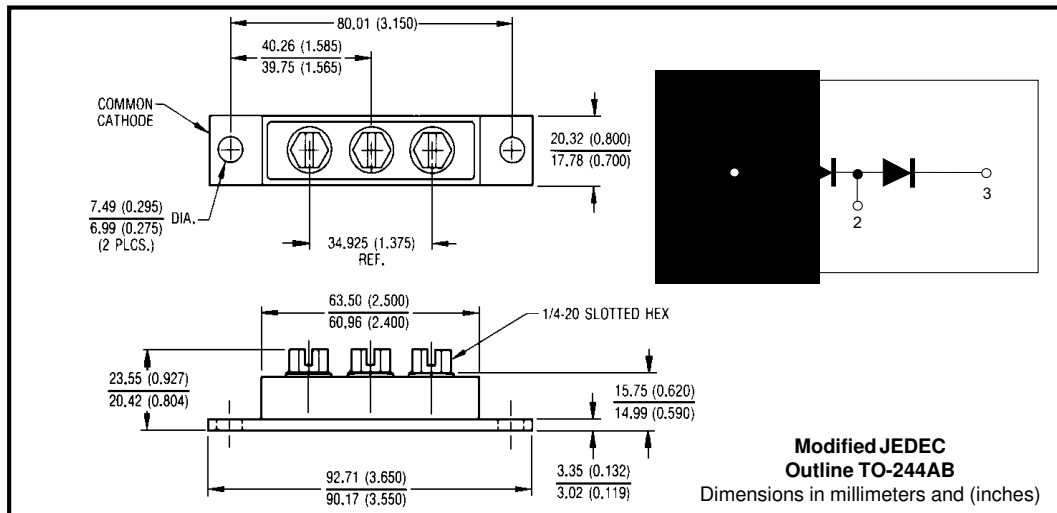
Major Ratings and Characteristics

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

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 °C, rectangular wave form
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	16,000	A	Following any rated load condition and with rated V _{RRM} applied
	2,100		
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 × 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 °C
	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	

Thermal-Mechanical Specifications

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

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 (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	

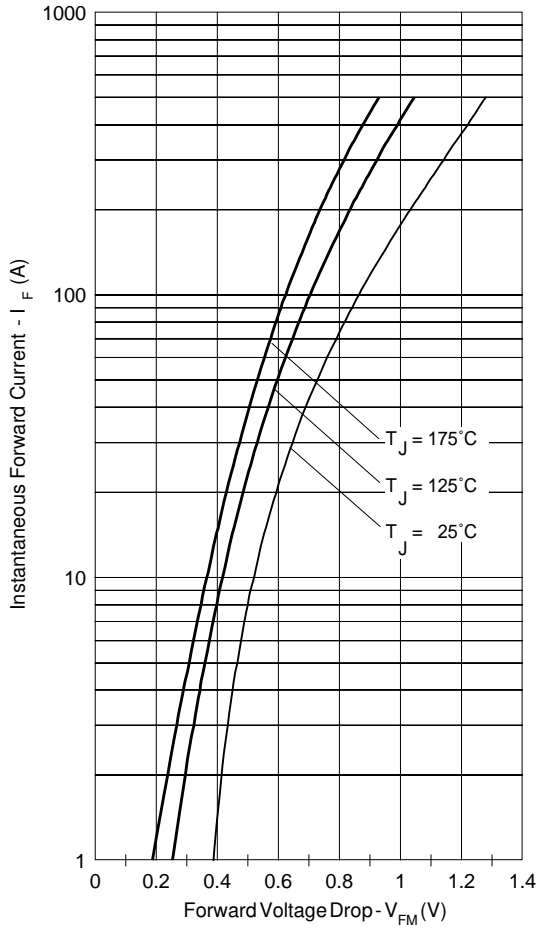


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

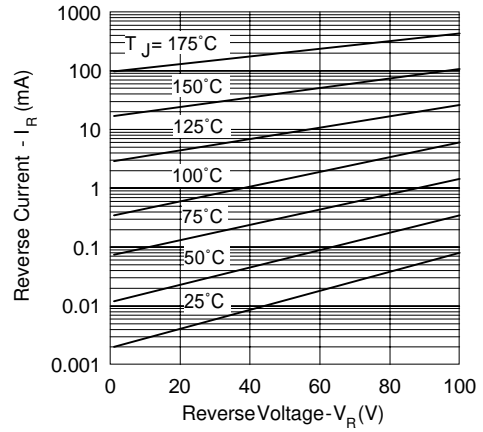


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

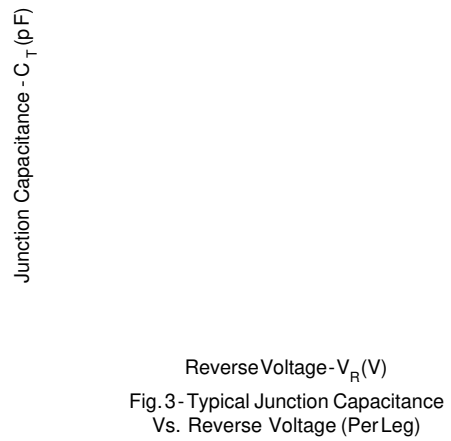


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

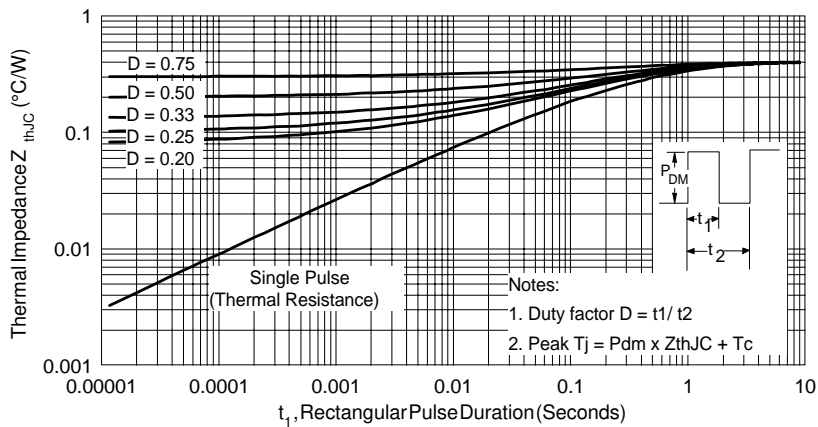


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

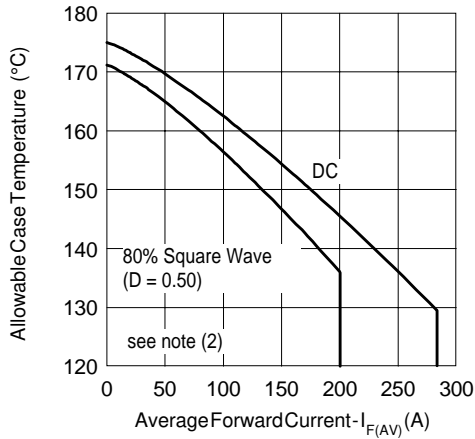


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

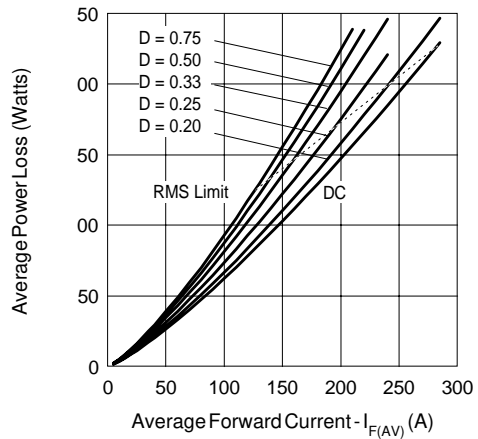


Fig. 6- Forward Power Loss Characteristics (Per Leg)

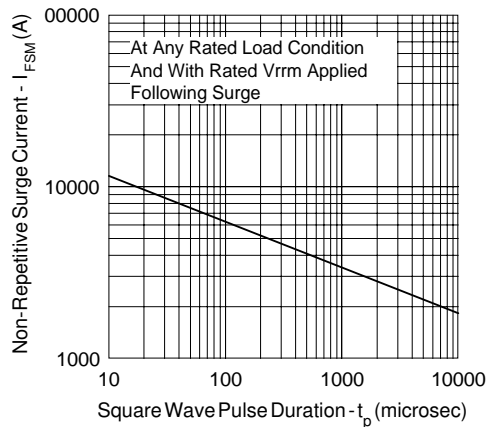


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

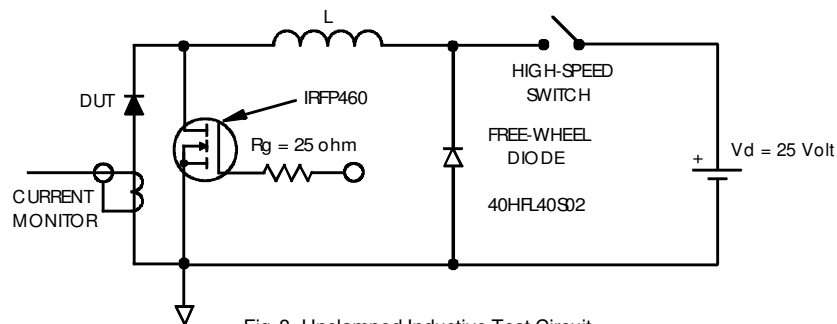


Fig. 8- Unclamped Inductive Test Circuit

- (2) Formula used: $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ 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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