

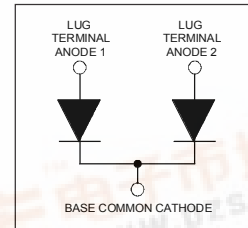
Bulletin PD-21103 12/05

# International IOR Rectifier

## 203CNQ100PbF

SCHOTTKY RECTIFIER

200 Amp



### Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	200	A
$V_{RRM}$	100	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	12,800	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 203CNQ.. center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175  $^\circ\text{C}$  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  $^\circ\text{C}$   $T_J$  operation
- Center tap module
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free

### Case Styles



TO-244

### Voltage Ratings

Part number	203CNQ100PbF
$V_R$ Max. DC Reverse Voltage (V)	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

### Absolute Maximum Ratings

Parameters	203CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	100	A	50% duty cycle @ $T_C = 142^\circ\text{C}$ , rectangular wave form
	200		
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	12,800	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated $V_{RRM}$ applied
	1,700		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 13\text{Amps}$ , $L = 0.2\text{mH}$
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	1	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

### Electrical Specifications

Parameters	203CNQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.86	V	@ 100A $T_J = 25^\circ\text{C}$
	1.03	V	@ 200A
	0.70	V	@ 100A $T_J = 125^\circ\text{C}$
	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	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.50	V	$T_J = T_J \text{ max.}$
$r_t$ Forward Slope Resistance	1.08	m $\Omega$	
$C_T$ Max. Junction Capacitance (Per Leg)	2,650	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle <2%

### Thermal-Mechanical Specifications

Parameters	Min	Typ	Max	Units
$T_J$ Max. Junction Temperature Range	- 55	-	175	$^\circ\text{C}$
$T_{Stg}$ Max. Storage Temperature Range	- 55	-	175	
$R_{thJC}$ Thermal Resistance, Junction to Case	Per Leg	-	0.38	$^\circ\text{C}/\text{W}$
	Per Module	-	0.19	K/W
$R_{thCS}$ Thermal Resistance, Case to Heatsink	-	0.10	-	
Wt Weight	-	68 (2.4)	-	g (oz)
Mounting Torque	35.4 (4)	-	53.1 (6)	lbf*in
Mounting Torque Center Hole	30 (3.4)	-	40 (4.6)	(Nm)
Terminal Torque	30 (3.4)	-	44.2 (5)	
Vertical Pull	-	-	80	lbf.in
2 inch Lever Pull	-	-	35	

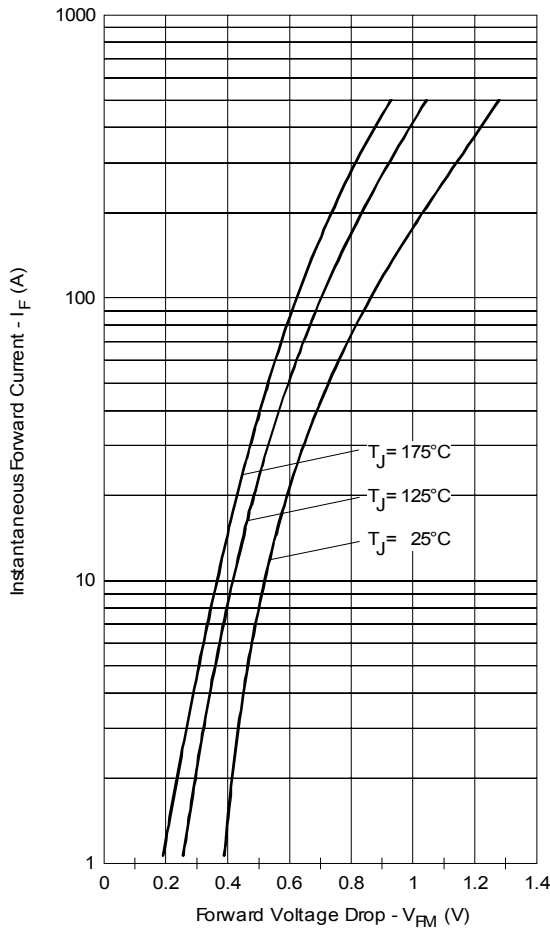


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

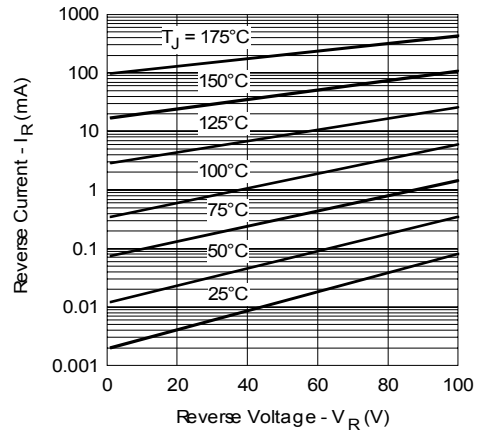


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

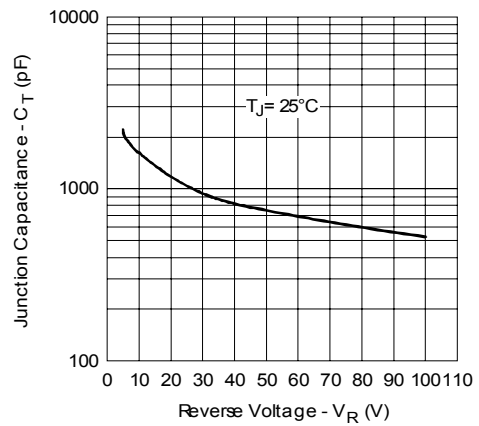


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

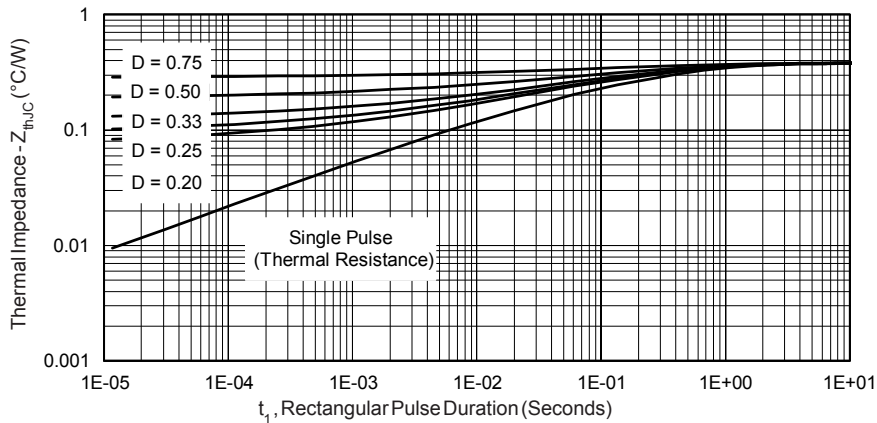


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

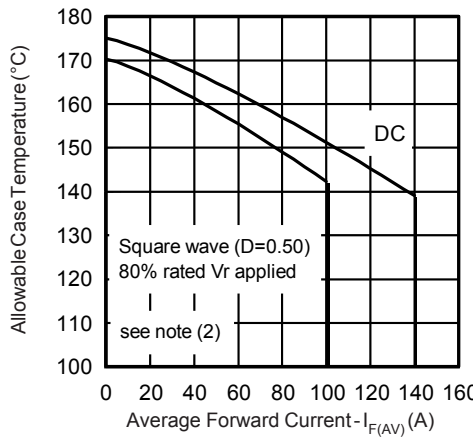


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

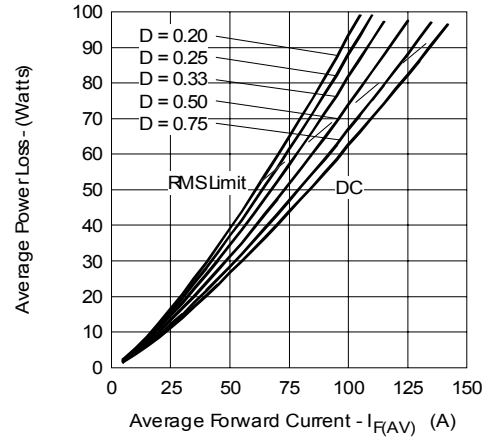


Fig. 6- Forward Power Loss Characteristics (Per Leg)

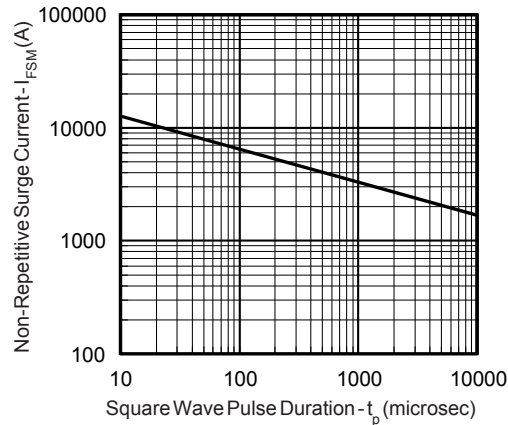


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

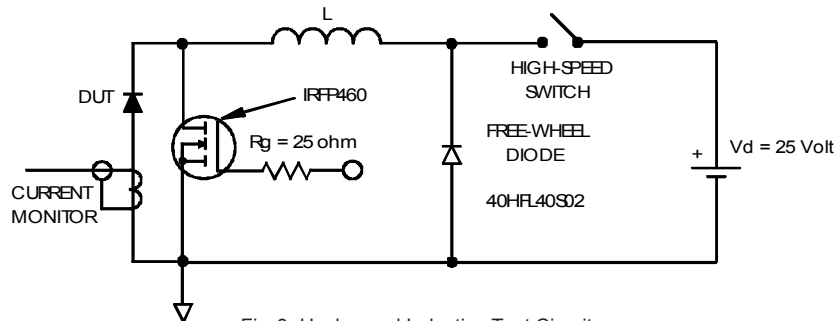
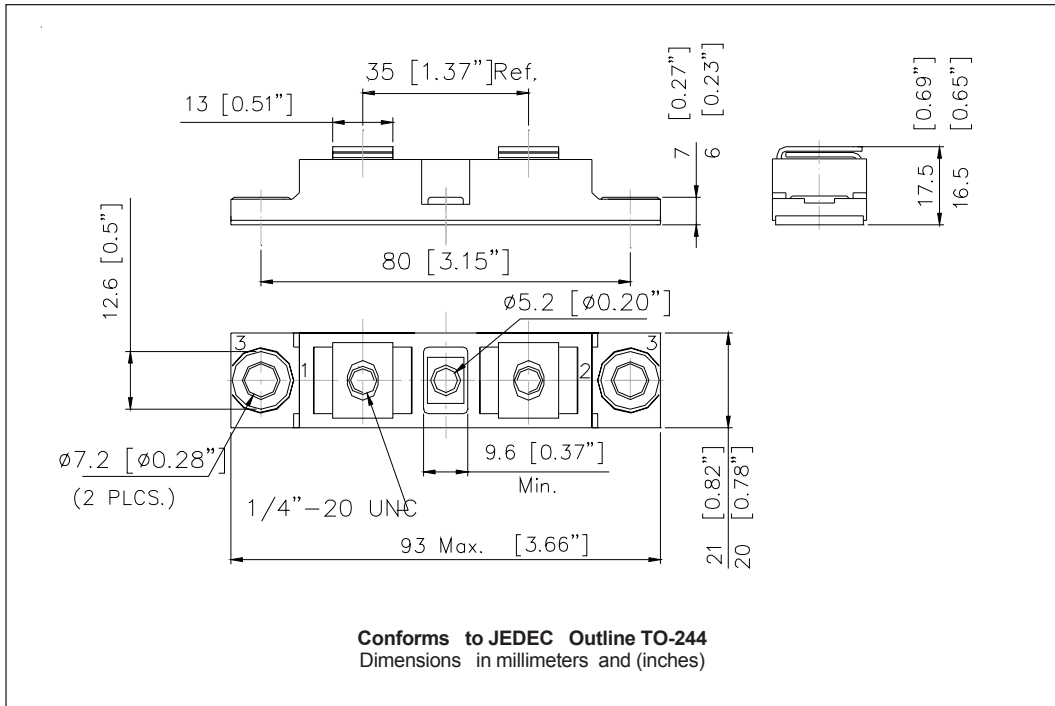


Fig. 8- Unclamped Inductive Test Circuit

- (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  $V_R$

Outline Table



Ordering Information Table

Device Code	20	3	C	N	Q	100	PbF														
	①	②	③	④	⑤	⑥	⑦														
	<b>1</b>	-	Average Current Rating (x 10)	<b>2</b>	-	Product Silicon Identification	<b>3</b>	-	C = Circuit Configuration	<b>4</b>	-	N = NOT Isolated	<b>5</b>	-	Q = Schottky Rectifier Diode	<b>6</b>	-	Voltage Rating (100 = 100V)	<b>7</b>	-	Lead-Free

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International  
**IOR** Rectifier

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level and Lead-Free.  
Qualification Standards can be found on IR's Web site.

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