

International IOR Rectifier

PD-2.244 rev. A 12/97

40CDQ... SERIES

SCHOTTKY RECTIFIER

40 Amp

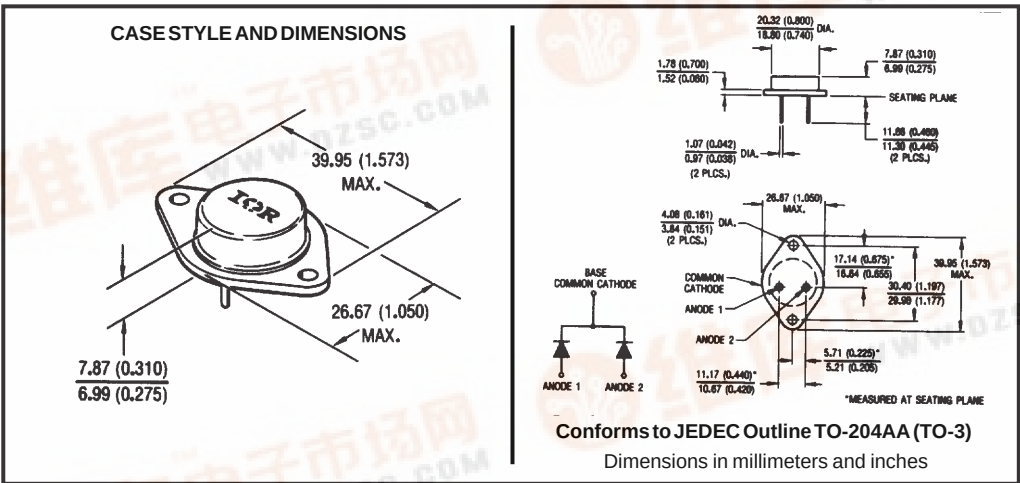
Major Ratings and Characteristics

Characteristics	40CDQ...	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	35 to 45	V
I_{FSM} @ $t_p = 5 \mu s$ sine	2000	A
V_F @ 20 Apk, $T_J = 125^\circ C$ (per leg)	0.55	V
T_J	-65 to 175	$^\circ C$

Description/Features

The 40CDQ center tap Schottky rectifier 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 switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Center tap TO-3 package
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Hermetic packaging



40CDQ... Series

PD-2.244 rev. A 12/97

International
IRF Rectifier

Voltage Ratings

Part number	40CDQ035	40CDQ040	40CDQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	40CDQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	40	A	50% duty cycle @ $T_C = 135^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2000	A	5 μs Sine or 3 μs Rect. pulse Following any rated load condition and with rated V_{RWM} applied
	400		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	27	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 4\text{ Amps}$, $L = 3.4\text{ mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	4	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	40CDQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.62	V	@ 20A $T_J = 25^\circ\text{C}$
	0.79	V	@ 40A
	0.55	V	@ 20A $T_J = 125^\circ\text{C}$
	0.71	V	@ 40A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2.5	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	25	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	1400	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	10.0	nH	Measured mounting plane to lead 5mm from package body
dv/dt Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

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

Thermal-Mechanical Specifications

Parameters	40CDQ	Units	Conditions
T_J Max. Junction Temperature Range	-65 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-65 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	2.20	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.10	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.20	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	11.4(0.40)	g(oz.)	
T Mounting Torque	Min. 12(10)	Kg-cm (lbf-in)	
	Max. 17(15)		
Case Style	TO-204AA(TO-3)	JEDEC	

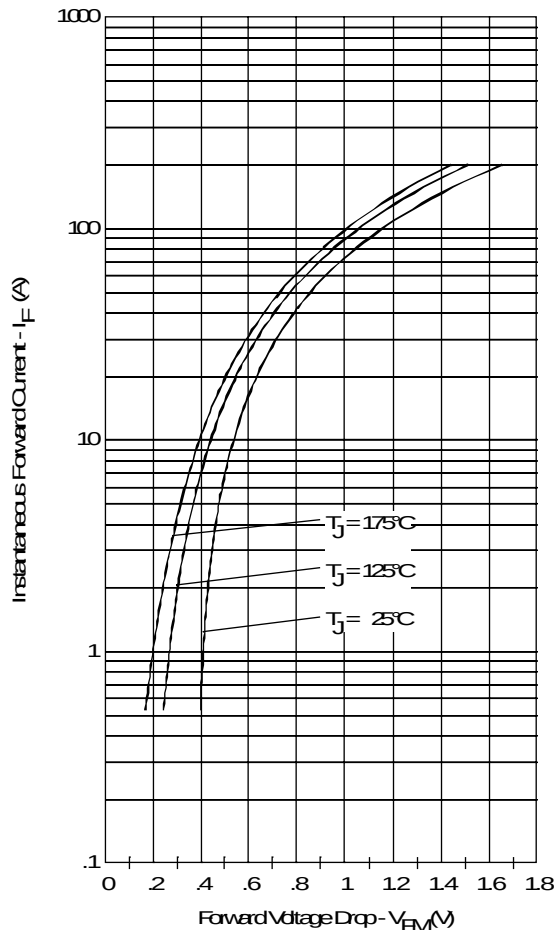


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

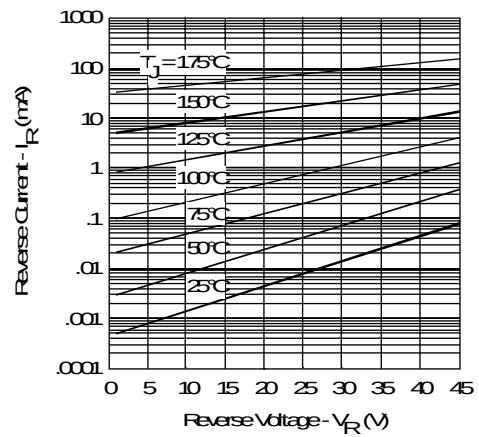


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

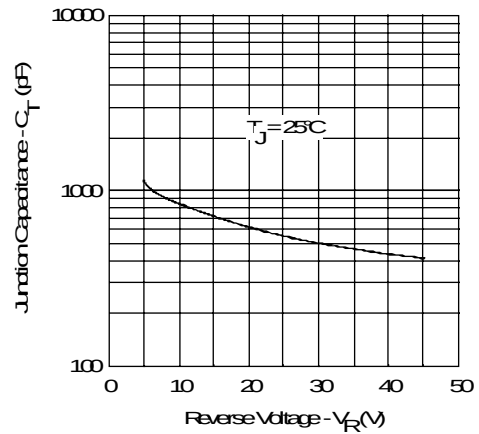


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

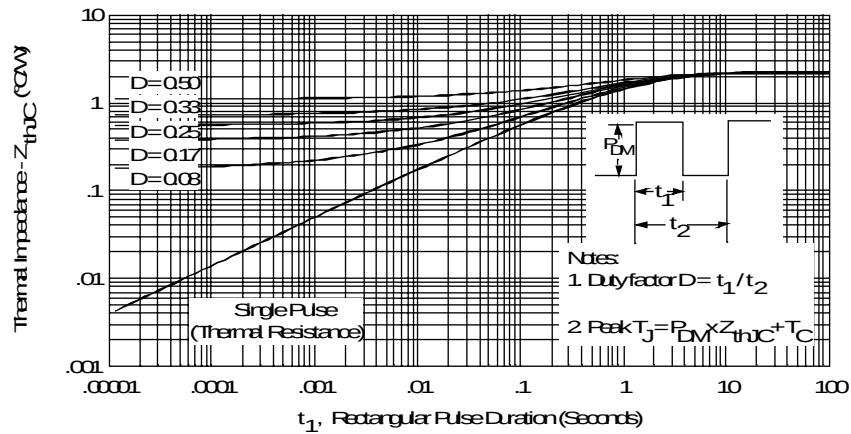


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

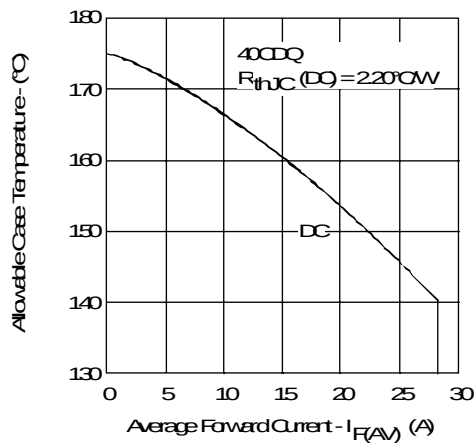


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

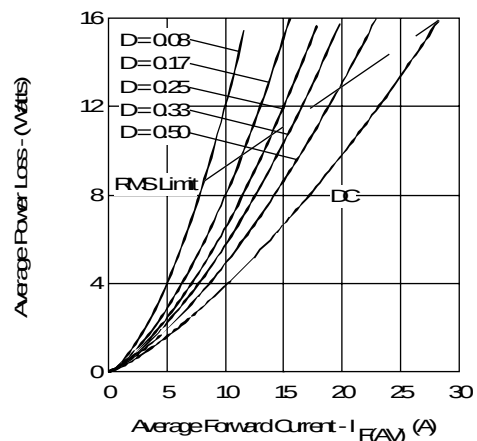


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

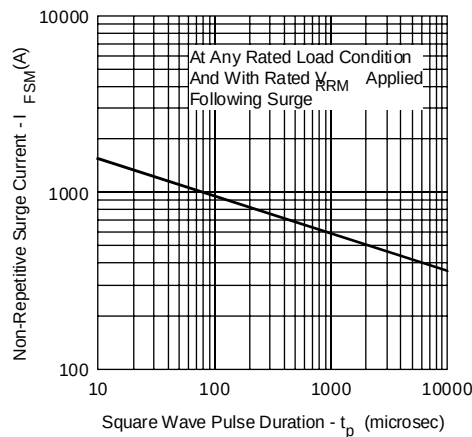


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

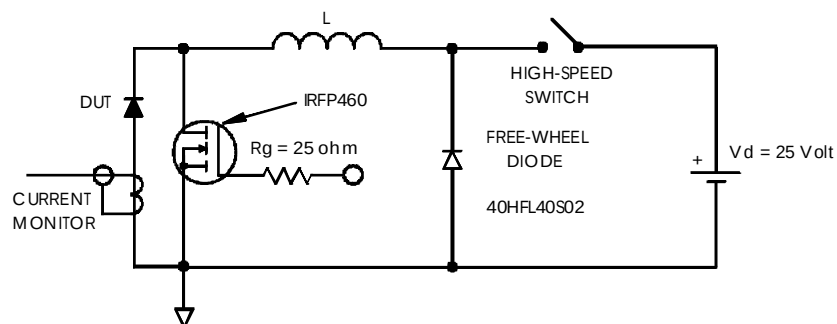


Fig. 8 - Unclamped Inductive Test Circuit