

International IOR Rectifier

PD-2.308 rev. A 12/97

40CPQ050 40CPQ060

SCHOTTKY RECTIFIER

40 Amp

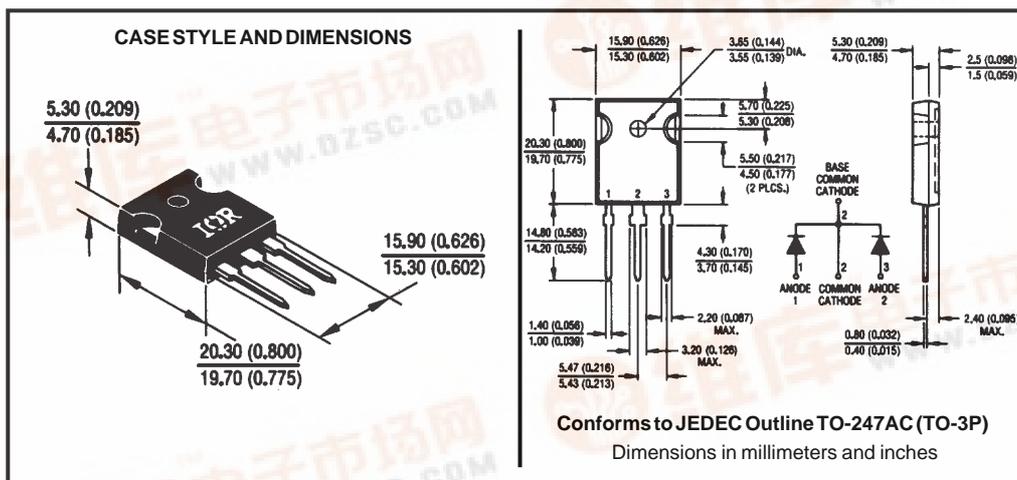
Major Ratings and Characteristics

Characteristics	40CPQ...	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	50/60	V
I_{FSM} @ tp=5 μ s sine	3200	A
V_F @ 20Apk, $T_J=125^\circ\text{C}$ (per leg)	0.49	V
T_J	-55 to 150	$^\circ\text{C}$

Description/Features

The 40CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



Voltage Ratings

Part number	40CPQ050	40CPQ060
V_R Max. DC Reverse Voltage (V)	50	60
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	40CPQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	40	A	50% duty cycle @ $T_C = 120^\circ\text{C}$, rectangular waveform
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	3200	A	Following any rated load condition and with rated V_{RRM} applied
	320		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	18	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2$ Amps, $L = 9.0$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	2	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	40CPQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.53	V	@ 20A
	0.68	V	@ 40A
	0.49	V	@ 20A
	0.64	V	@ 40A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.7	mA	$T_J = 25^\circ\text{C}$
	96	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	1600	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	7.5	nH	Measured lead 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	40CPQ...	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	1.25	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.63	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.24	$^\circ\text{C}/\text{W}$	Mounting surface, smooth and greased
wt Approximate Weight	6(0.21)	g(oz.)	
T Mounting Torque	Min.	6(5)	Non-lubricated threads
	Max.	12(10)	
Case Style	TO-247AC(TO-3P)	JEDEC	

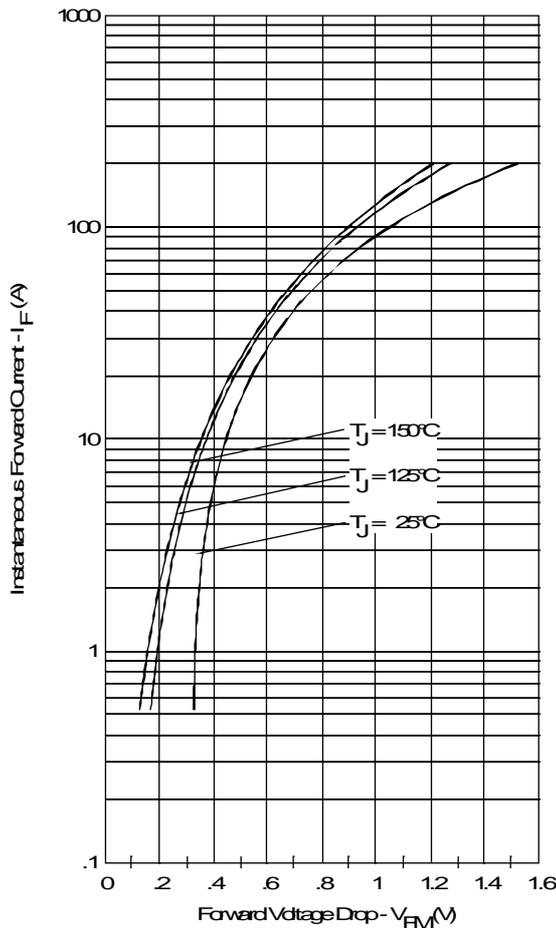


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

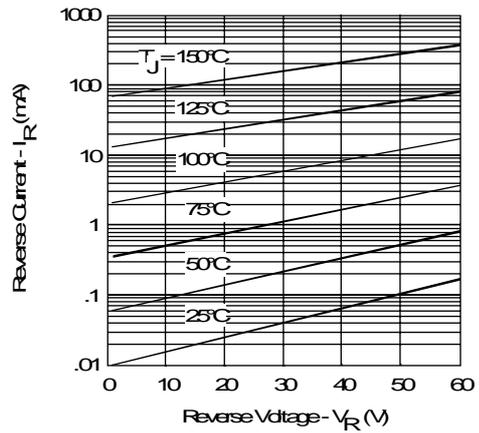


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

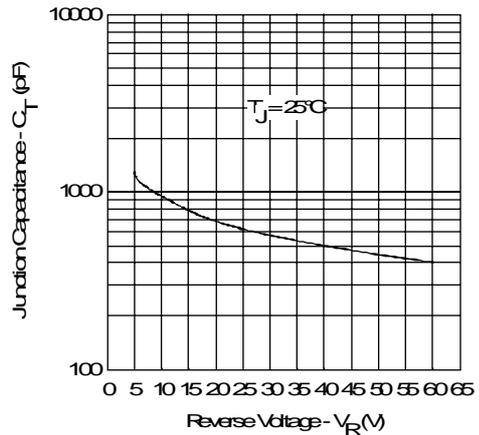


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

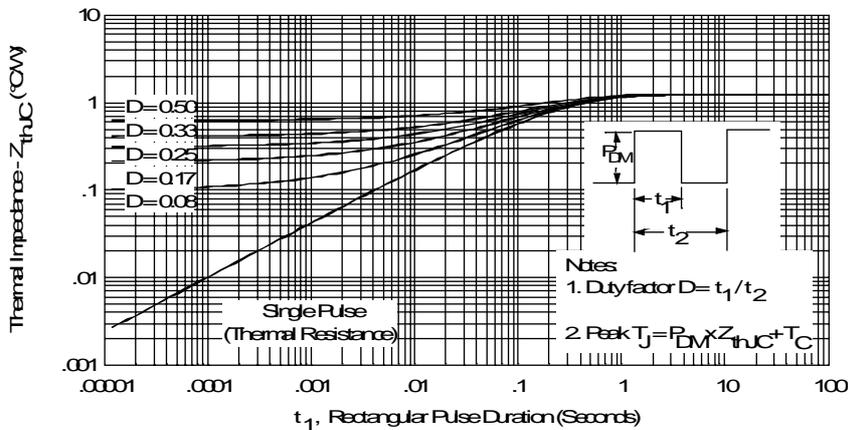


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

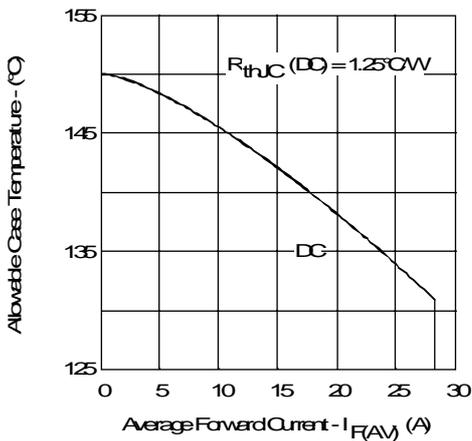


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

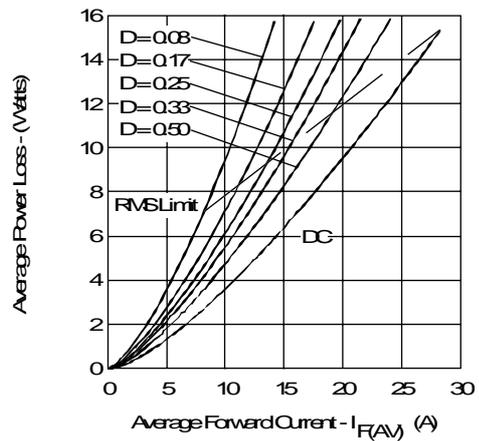


Fig. 6- Forward Power Loss Characteristics (Per Leg)

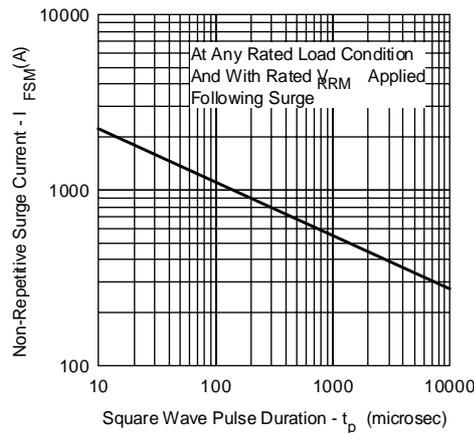


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

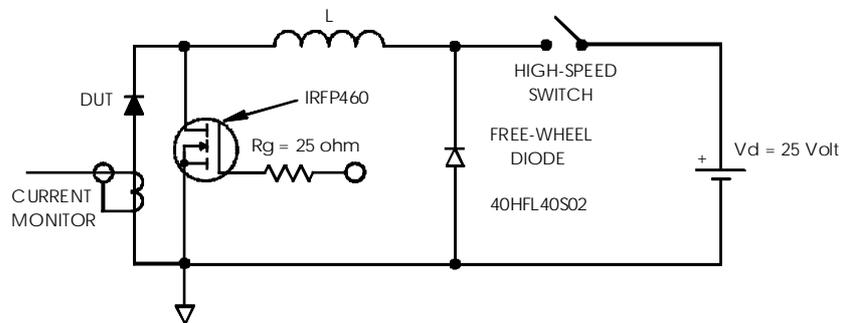


Fig. 8- Unclamped Inductive Test Circuit