

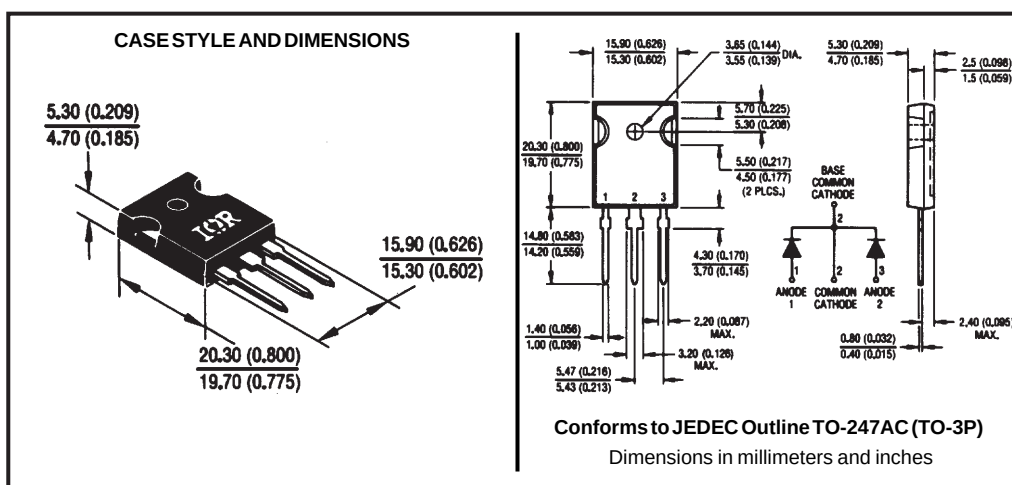
Major Ratings and Characteristics

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 @ 20 Apk, $T_J = 125^\circ\text{C}$ (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



40CPQ050, 40CPQ060

PD-2.308 rev. A 12/97

International
IR Rectifier

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 wave form		
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	3200	A	5 μs Sine or 3 μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied	
		320		10ms Sine or 6ms Rect. pulse		
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	T _J = 25 °C
		0.68	V	@ 40A	
		0.49	V	@ 20A	T _J = 125 °C
		0.64	V	@ 40A	
I _{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.7	mA	T _J = 25 °C	V _R = rated V _R
		96	mA	T _J = 125 °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	-55to150	°C	
T _{stg}	Max. Storage Temperature Range	-55to150	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)	1.25	°C/W	DCoperation * See Fig. 4
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	0.63	°C/W	DCoperation
R _{thCS}	Typical Thermal Resistance, Case to Heatsink	0.24	°C/W	Mounting surface , smooth and greased
wt	Approximate Weight	6(0.21)	g(oz.)	
T	Mounting Torque	Min. 6(5)	Kg-cm (lbf-in)	Non-lubricated threads
		Max. 12(10)		
Case Style		TO-247AC(TO-3P)	JEDEC	

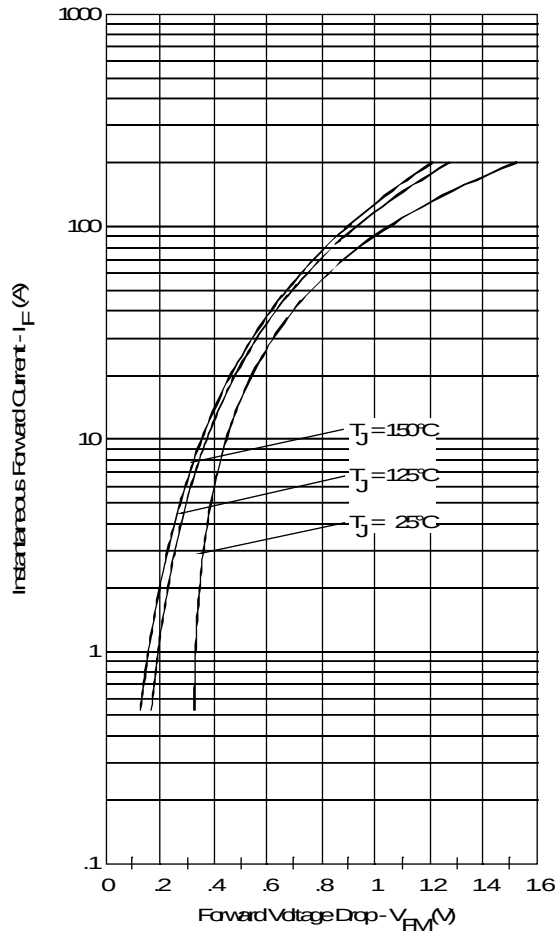


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

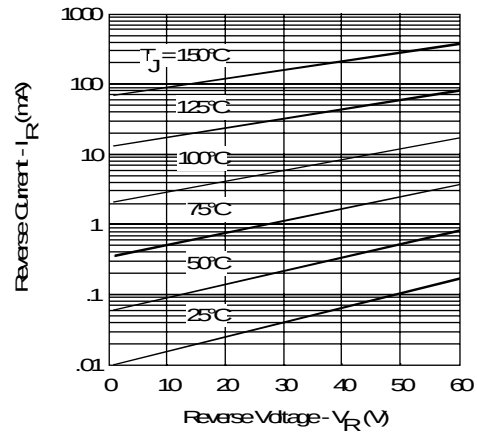


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

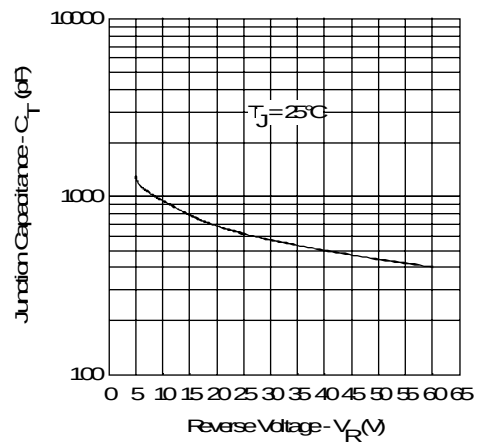


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

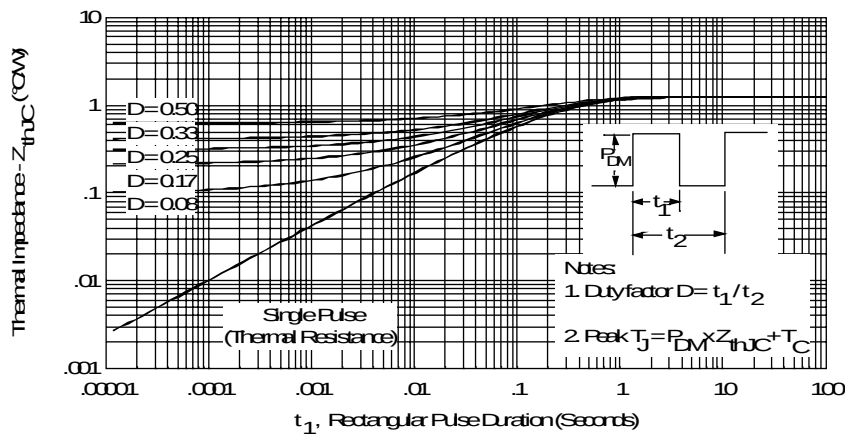


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

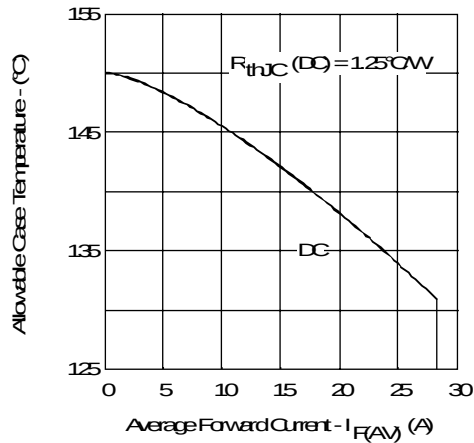


Fig. 5- Max. Allowable Case Temperature
Vs. Average Forward Current (Per Leg)

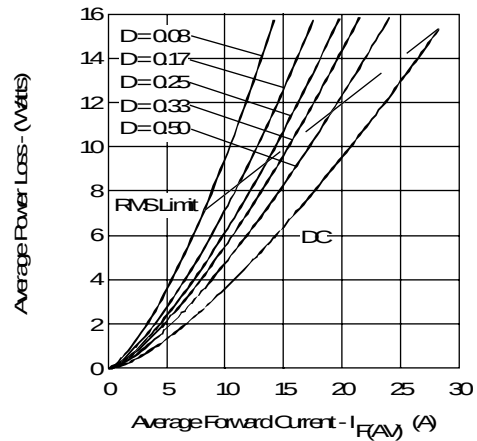


Fig. 6- Forward Power Loss Characteristics
(Per Leg)

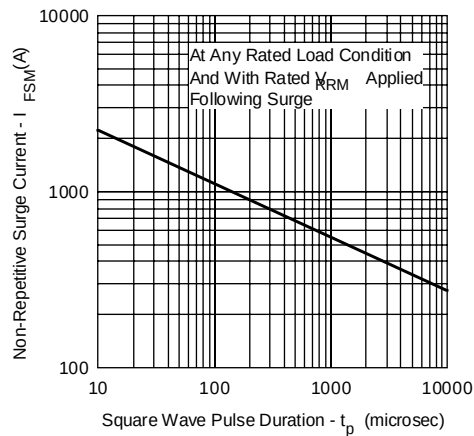


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

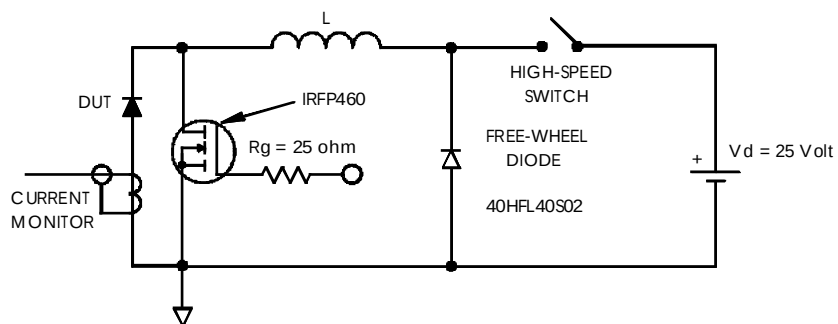


Fig. 8- Unclamped Inductive Test Circuit