

International
IR Rectifier

40CPQ080
 40CPQ100

SCHOTTKY RECTIFIER

40 Amp

Major Ratings and Characteristics

Characteristics	40CPQ...	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	80/100	V
I_{FSM} @ $t_p = 5 \mu s$ sine	2950	A
V_F @ 20 Apk, $T_J = 125^\circ C$ (per leg)	0.61	V
T_J	-55 to 175	$^\circ C$

Description/ Features

The 40CPQ... center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to $175^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

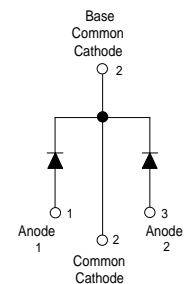
- $175^\circ C$ T_J operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

40CPQ...



TO-247AC



Voltage Ratings

Part number	40CPQ080	40CPQ100
V_R Max. DC Reverse Voltage (V)	80	100
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 @ $T_C = 145^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2950	A	Following any rated load condition and with rated V_{RRM} applied
	300		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	11.25	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2$ Amps, $L = 5.6$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	0.75	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)	0.77	V	@ 20A $T_J = 25^\circ\text{C}$
	0.91	V	@ 40A
	0.61	V	@ 20A $T_J = 125^\circ\text{C}$
	0.75	V	@ 40A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.25	mA	$T_J = 25^\circ\text{C}$
	15	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
C_T Max. Junction Capacitance (Per Leg)	600	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)	10000	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 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
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)	Kg-cm (lbf-in)	Non-lubricated threads
	Max. 12 (10)		
Case Style	TO-247AC(TO-3P)	JEDEC	

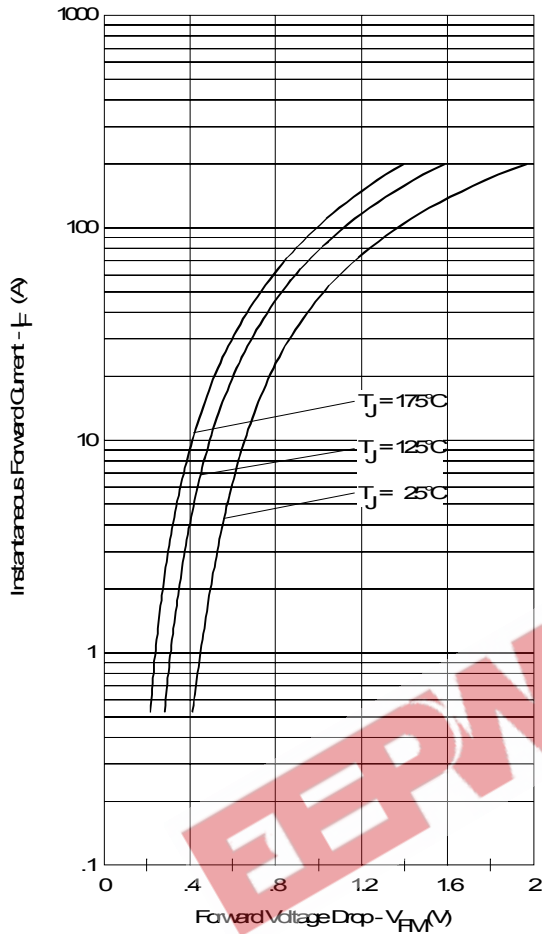


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

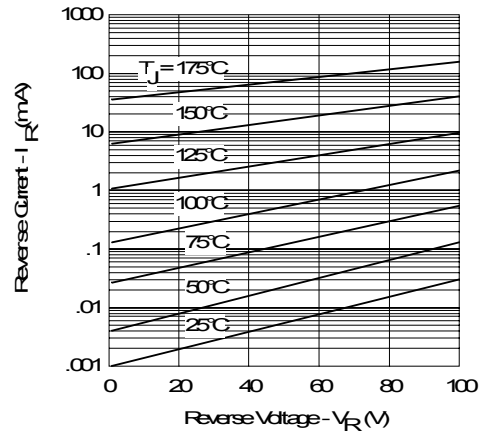


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

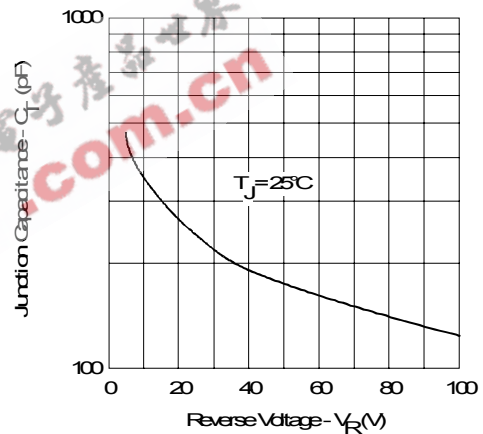


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

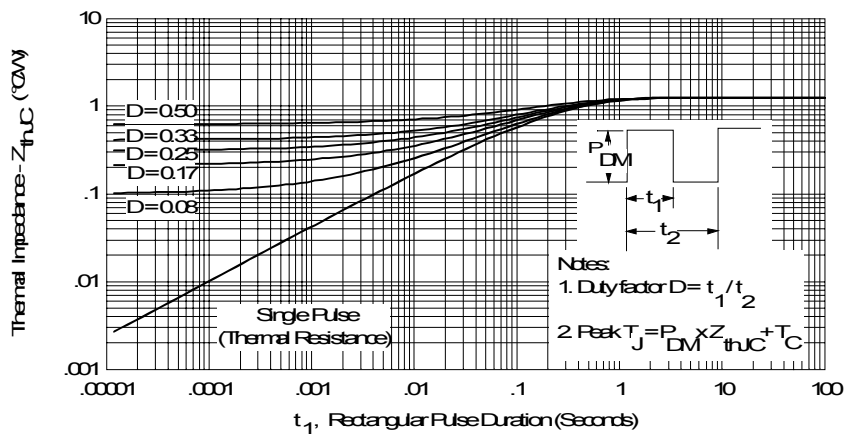


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

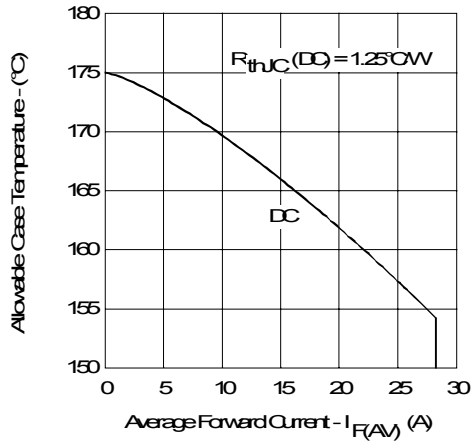


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

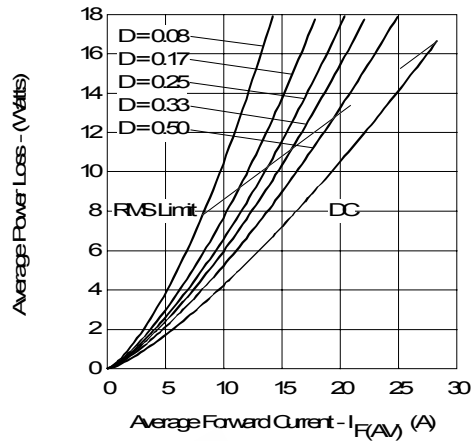


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

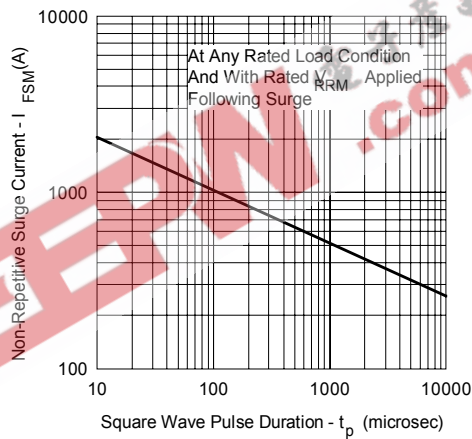


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

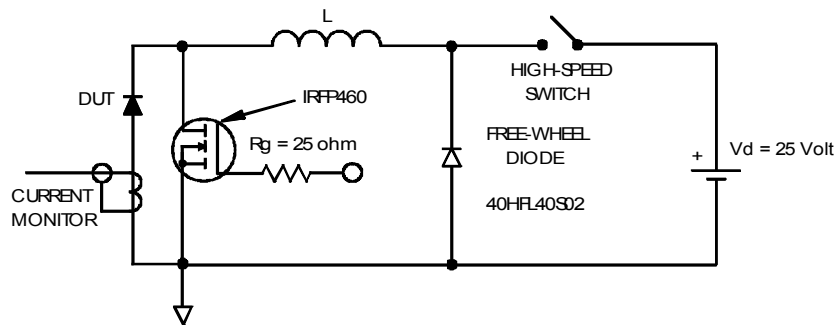
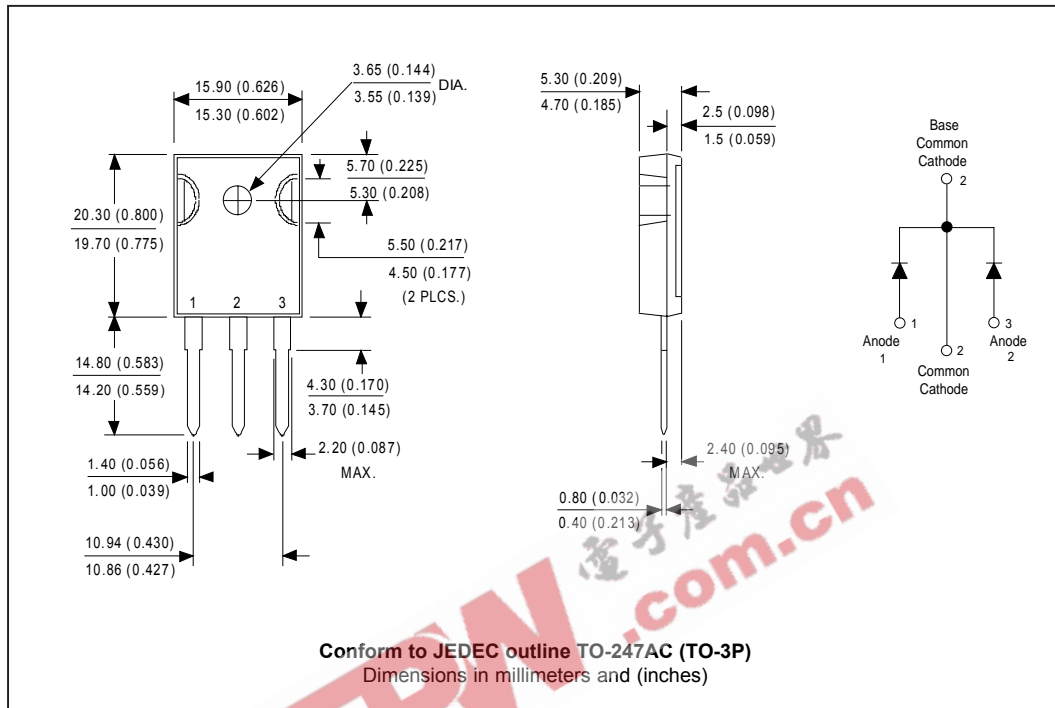


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



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.