

SCHOTTKY RECTIFIER

40CPQ080PbF  
40CPQ100PbF

$I_{F(AV)} = 40\text{Amp}$   
 $V_R = 80 - 100\text{V}$

40 Amp

**Major Ratings and Characteristics**

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

**Description/ Features**

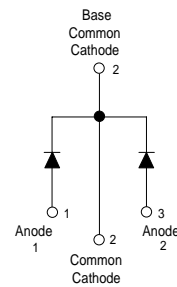
The 40CPQ...PbF center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and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

- 175° C  $T_J$  operation
- Center tap TO-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
- Lead-Free ("PbF" suffix)

**Case Styles**



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	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse
	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 $\mu\text{sec}$ Frequency limited by $T_{Jmax}$ . $V_A = 1.5 \times V_R$ typical

## Electrical Specifications

Parameters	40CPQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.77	V	@ 20A
	0.91	V	@ 40A
	0.61	V	@ 20A
	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	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance (Per Leg)	600	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

(1) Pulse Width < 300 $\mu\text{s}$ , 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)	Non-lubricated threads
	Max.	12 (10)	
Case Style	TO-247AC(TO-3P)	JEDEC	
Device Marking	40CPQ080		
	40CPQ100		

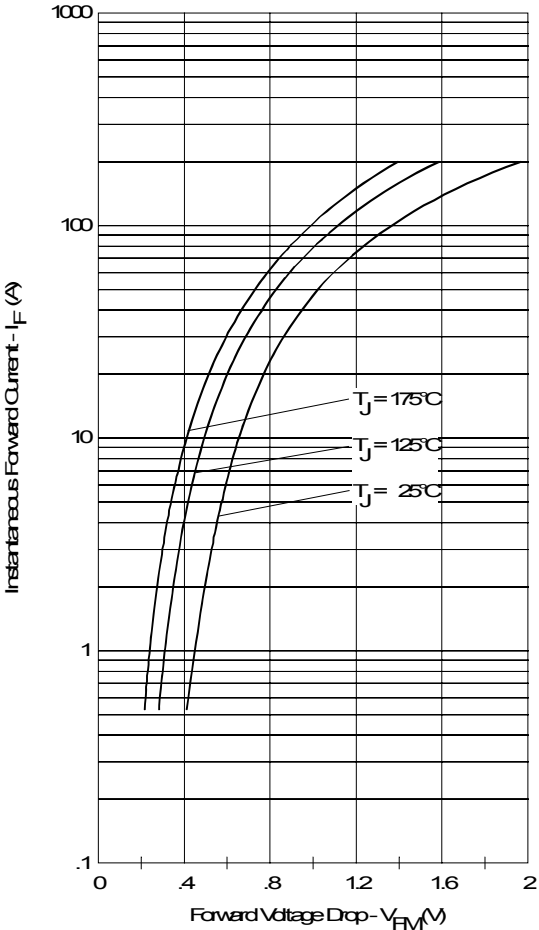


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

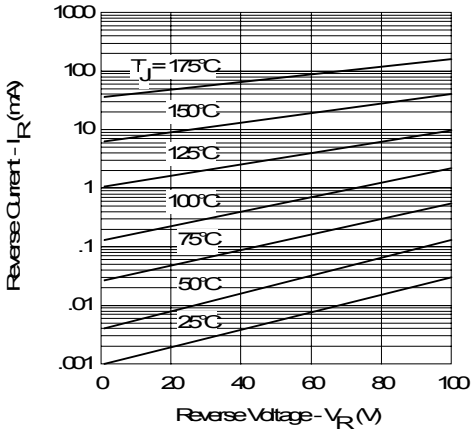


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

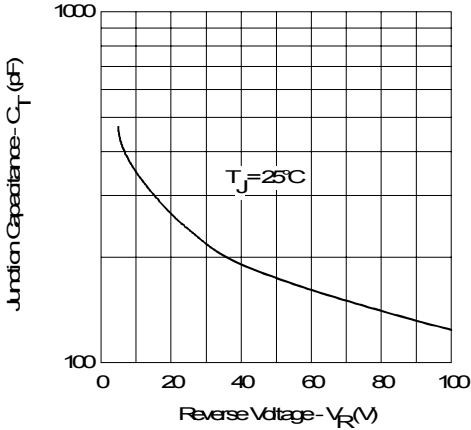


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

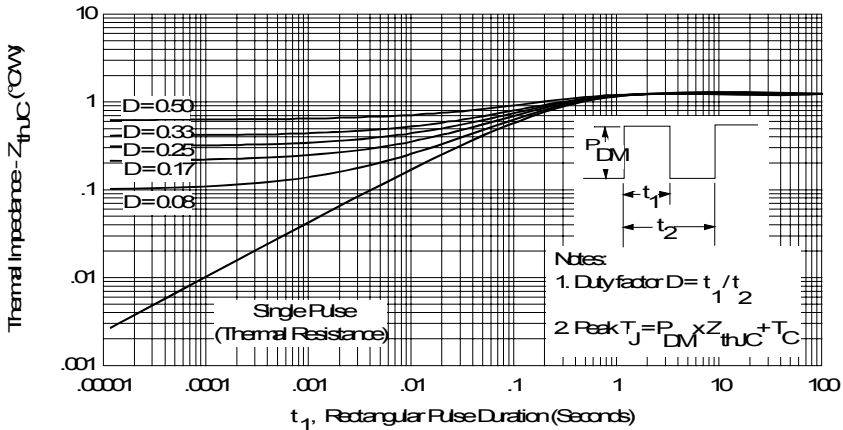


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

40CPQ080PbF, 40CPQ100PbF

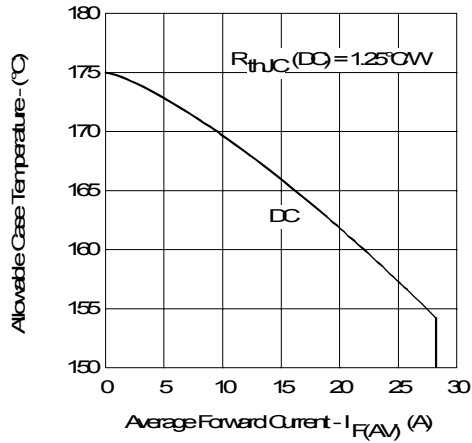


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

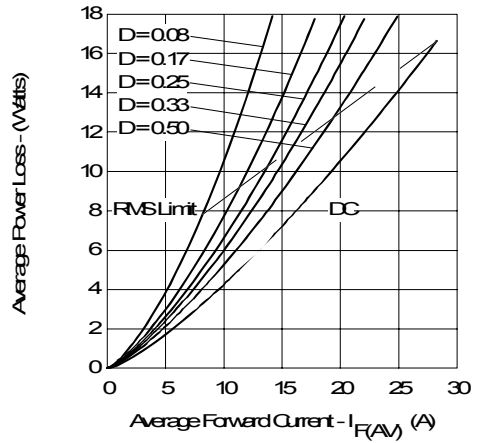


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

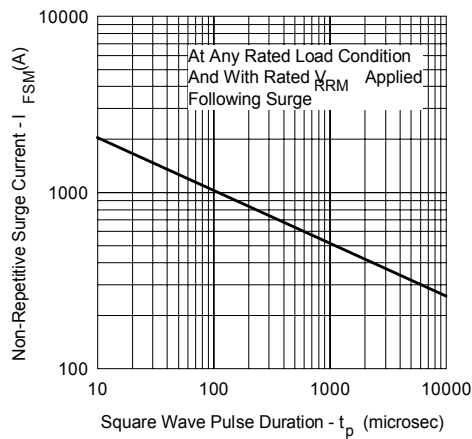


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

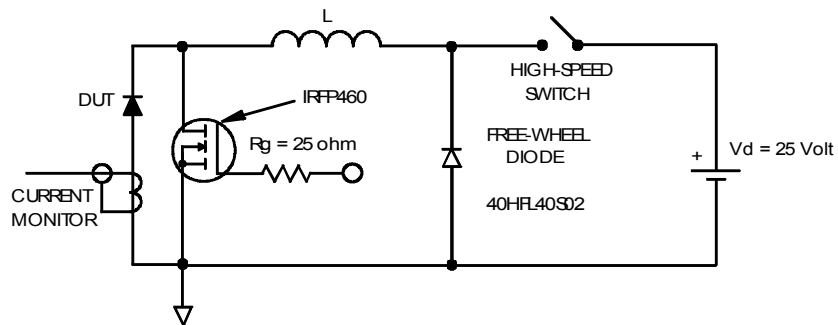


Fig. 8 - Unclamped Inductive Test Circuit

40CPQ080PbF, 40CPQ100PbF

Outline Table

**NOTES:**

- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
- DIMENSIONS ARE SHOWN IN INCHES.
- CONTOUR OF SLOT OPTIONAL.
- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
- LEAD FINISH UNCONTROLLED IN L1.
- #P1 TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .024 INCH.
- OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC.

SYMBOL	DIMENSIONS		DIMENSIONS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.183	.209	4.65	5.31	
A1	.027	.102	2.21	2.59	
A2	.059	.096	1.50	2.49	
B	.038	.050	0.99	1.40	
b1	.039	.055	0.99	1.35	
b2	.065	.094	1.65	2.39	
b3	.065	.092	1.65	2.34	
b4	.102	.135	2.59	3.43	
b5	.102	.133	2.59	3.38	
C	.075	.076	0.98	0.89	
c1	.075	.075	0.98	0.84	
D	.776	.815	19.71	20.70	4
D1	.515	-	13.08	-	5
D2	.020	.025	0.51	1.35	
E	.602	.625	15.29	15.87	4
E1	.520	-	13.46	-	
E2	.178	.216	4.52	5.49	
H	.215	RSC	5.45	RSC	
L	.075	RSC	0.25	RSC	
L1	.559	5.54	14.20	14.10	
L2	.146	.169	3.71	4.29	
L3	.140	.174	3.56	4.41	
L4	.209	.224	5.31	5.69	
L5	.217	RSC	5.51	RSC	

**LEAD ASSIGNMENTS**

- 1- GATE
- 2- DRAIN
- 3- SOURCE
- 4- DRAIN

**SIGNAL CURRENT**

- 1- GATE
- 2- COLLECTOR
- 3- EMITTER
- 4- COLLECTOR

**DIODES**

- 1- ANODE/OPEN
- 2- CATHODE
- 3- ANODE

**Conform to JEDEC outline TO-247AC (TO-3P)**  
Dimensions in millimeters and (inches)

Marking Information

EXAMPLE: THIS IS A 40CPQ080 WITH ASSEMBLY LOT CODE 5657 ASSEMBLED ON WW 35, 2000 IN ASSEMBLY LINE "H"

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE

P = LEAD-FREE  
YEAR 0 = 2000  
WEEK 35  
LINE H

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### Ordering Information Table

Device Code					
40	C	P	Q	100	PbF
①	②	③	④	⑤	⑥

<b>1</b>	-	Current Rating (40 = 40A)
<b>2</b>	-	Circuit Configuration C = Common Cathode
<b>3</b>	-	Package P = TO-247
<b>4</b>	-	Schottky "Q" Series
<b>5</b>	-	Voltage Code
<b>6</b>	-	• none = Standard Production • PbF = Lead-Free

080 = 80V  
100 = 100V

Tube Standard Pack Quantity : 25 pieces