

International
IR Rectifier

40CPQ080
40CPQ100

SCHOTTKY RECTIFIER

40 Amp

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

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	80-100	V
I_{FSM} @tp = 5 μ 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

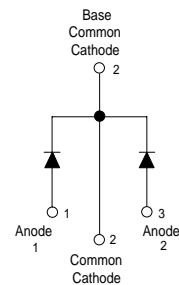
The 40CPQ... center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse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

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	Following any rated load condition and with rated V_{RWM} 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_{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 $T_J = 25^\circ\text{C}$
	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	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	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°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)	Non-lubricated threads
	Max.	12 (10)	
Case Style	TO-247AC(TO-3P)	JEDEC	
Device Marking	40CPQ080		
	40CPQ100		

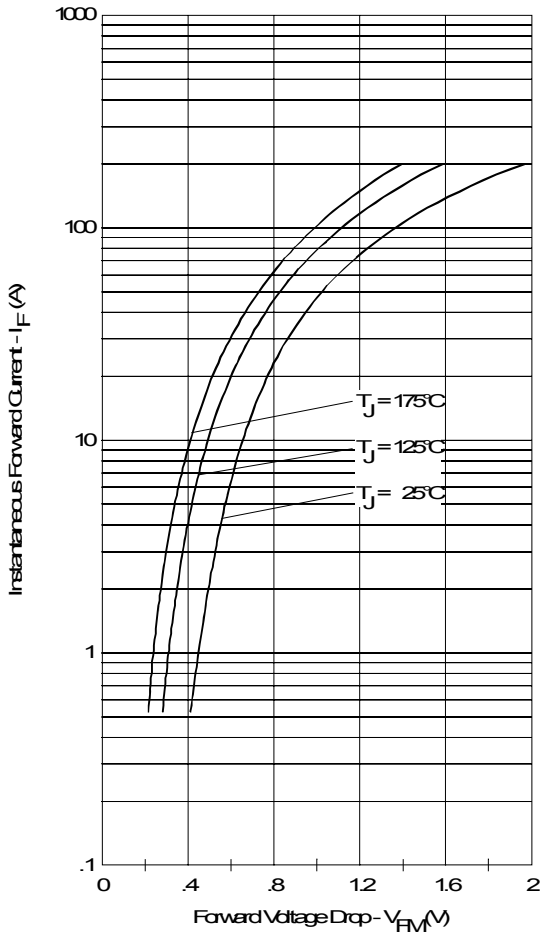


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

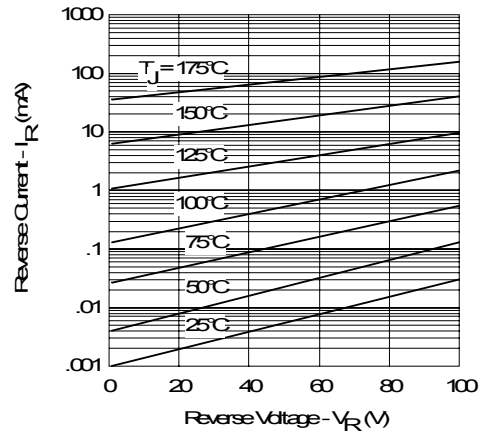


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

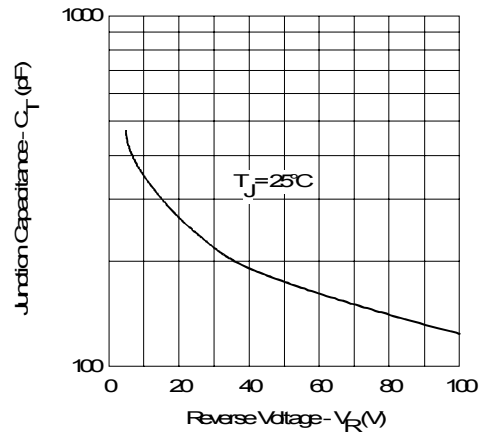


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

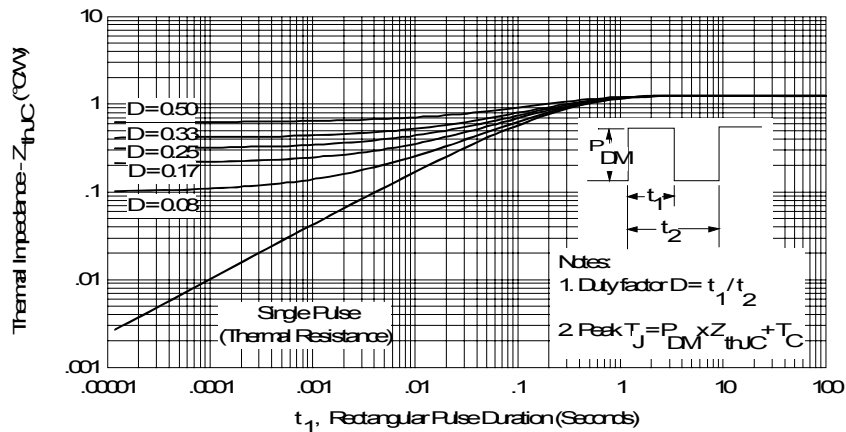


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

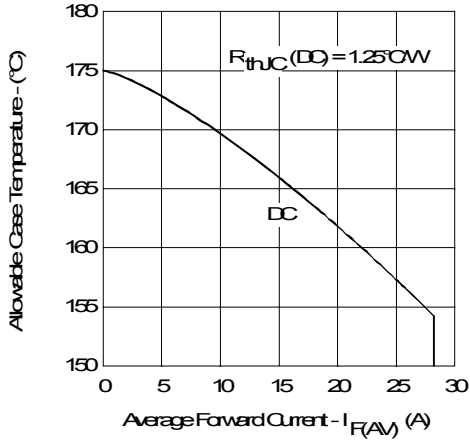


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

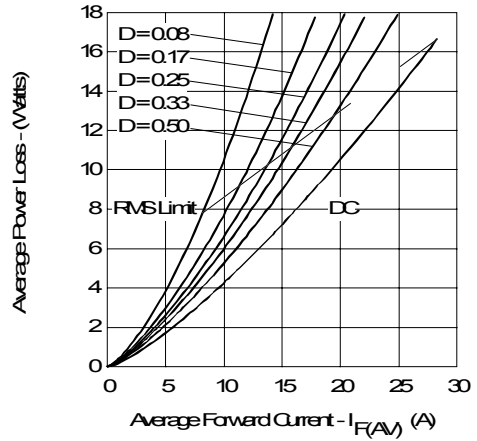


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

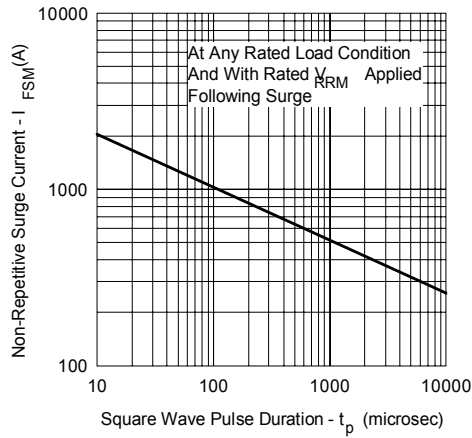


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

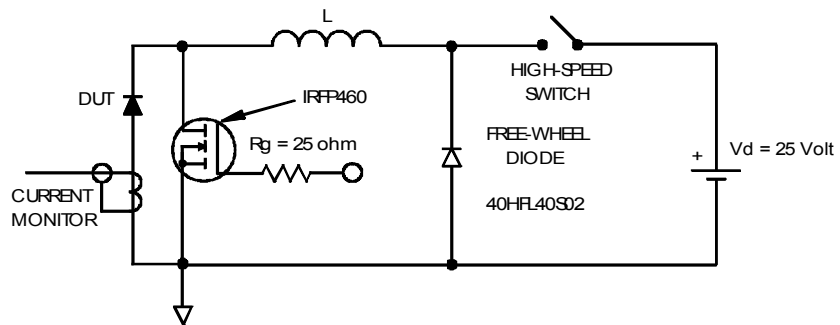


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

NOTES:

- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
- DIMENSIONS ARE SHOWN IN INCHES.
- CONTOUR OF SLOT OPTIONAL.
- DIMENSION D OR 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.
- LEAD FINISH UNCONTROLLED IN U.S.
- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
- MP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
- OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC.

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.183	.209	4.65	5.31	
A1	.087	.102	2.21	2.59	
A2	.059	.098	1.50	2.49	
b	.039	.065	0.99	1.65	
b1	.039	.051	0.99	1.28	
b2	.065	.084	1.65	2.13	
b3	.065	.092	1.65	2.34	
b4	.102	.150	2.59	3.81	
b5	.102	.133	2.59	3.38	
c	.075	.035	0.38	0.89	
c1	.075	.033	0.38	0.84	4
d	.776	.815	19.71	20.70	
D1	.315	-	13.08	-	5
D2	.020	.065	0.51	1.65	
E	.602	.625	15.29	15.87	4
E1	.530	-	13.46	-	
E2	.178	.216	4.52	5.49	
e	.219 BSC	-	5.46 BSC	-	
h	.020	-	0.25	-	
L	.658	.634	16.70	16.10	
L1	.148	.139	3.71	3.53	
MP	.140	.143	3.56	3.63	
MP1	-	.291	-	7.39	
Q1	.200	.224	5.31	5.69	
S	.217 BSC	-	5.51 BSC	-	

LEAD ASSIGNMENTS

HEXCEL

- GATE
- DRAIN
- SOURCE
- EMITTER

IGBTs, CAPS

- GATE
- COLLECTOR
- EMITTER
- COLLECTOR

DIODES

- ANODE/OPEN
- CATHODE
- ANODE

SECTION C-C, D-D, E-E

PLATING
BASE METAL

(b1, b3, b5)

(b2, b4)

VIEW A-A

VIEW B

SECTION C-C, D-D, E-E

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

Marking Information

EXAMPLE: THIS IS A 40CPQ100
WITH LOT CODE 58 07
ASSEMBLED ON WW 35, 2000
IN THE ASSEMBLY LINE "H"

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE
YEAR 0 = 2000
WEEK 35
LINE H

Ordering Information Table

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

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

080 = 80V
100 = 100V

Tube Standard Pack Quantity : 25 pieces

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.