



40CPQ050
40CPQ060

SCHOTTKY RECTIFIER

40 Amp

$I_{F(AV)} = 40\text{Amp}$
 $V_R = 50 - 60\text{V}$

Major Ratings and Characteristics

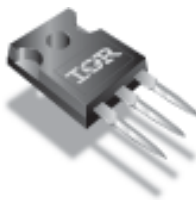
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	50-60	V
I_{FSM} @tp = 5 μ s sine	3200	A
V_F @20 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.49	V
T_J	-55 to 150	$^\circ\text{C}$

Description/ Features

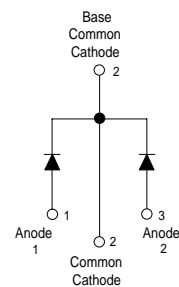
The 40CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes,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

Case Styles



TO-247AC



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 μ s Sine or 3 μ s Rect. pulse
	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 μ sec 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	10000	V/ μ s	(Rated V_R)

(1) Pulse Width < 300 μ s, 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	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.63	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.24	$^\circ\text{C/W}$	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	
Marking Device	40CPQ050		
	40CPQ060		

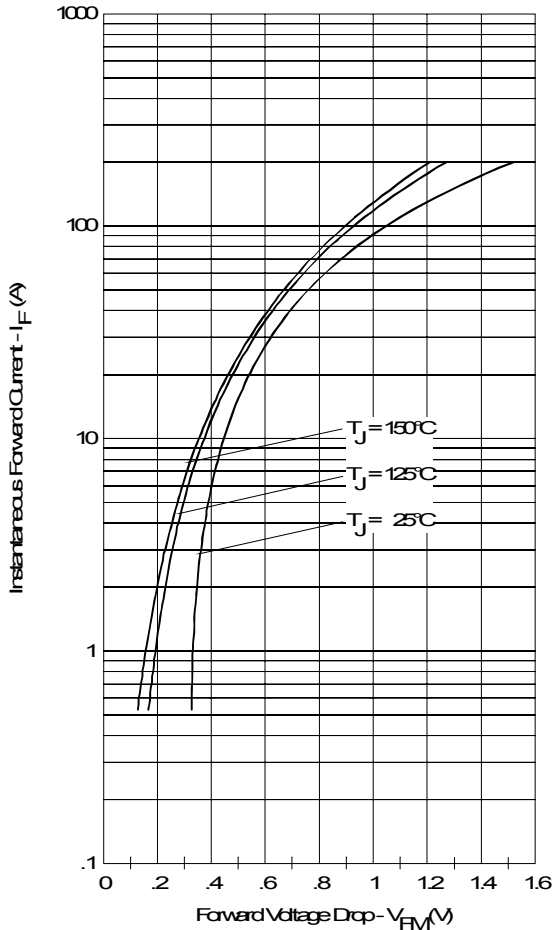


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

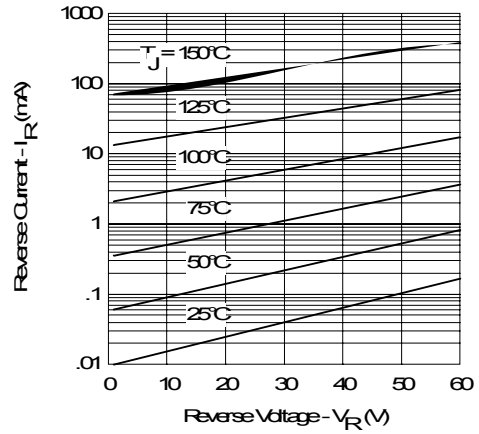


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

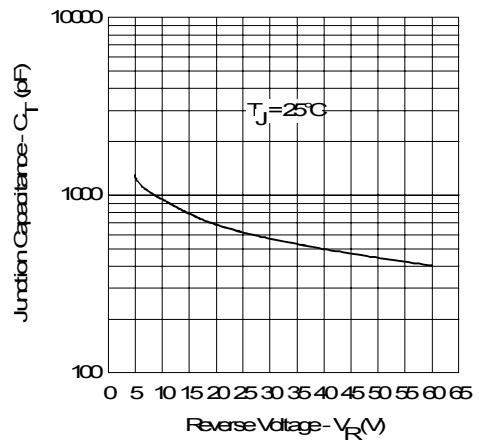


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

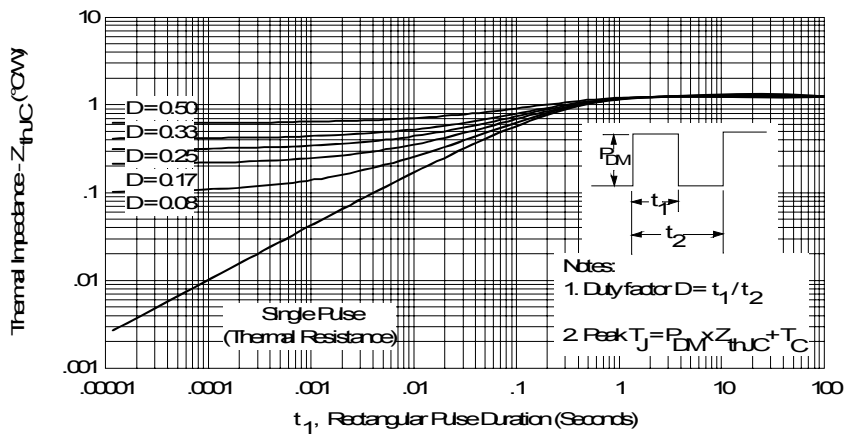


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

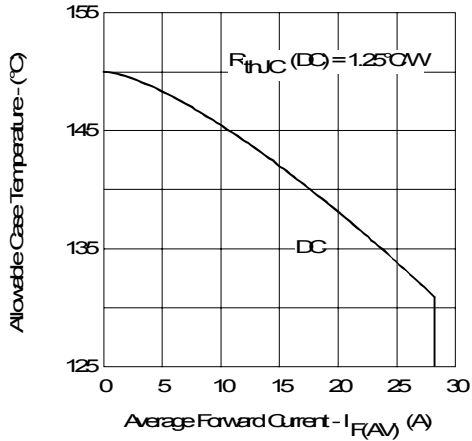


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

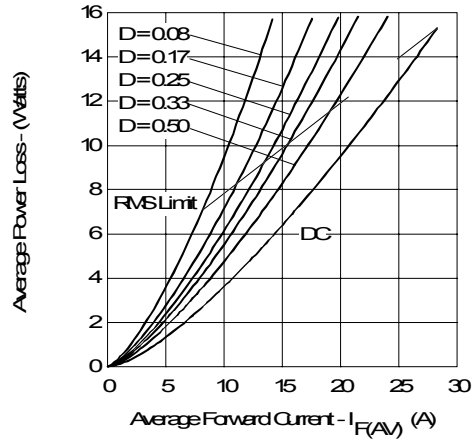


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

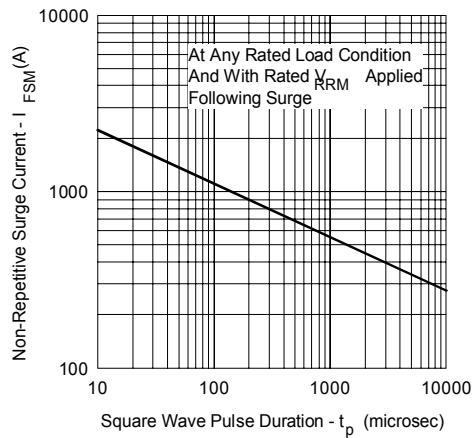


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

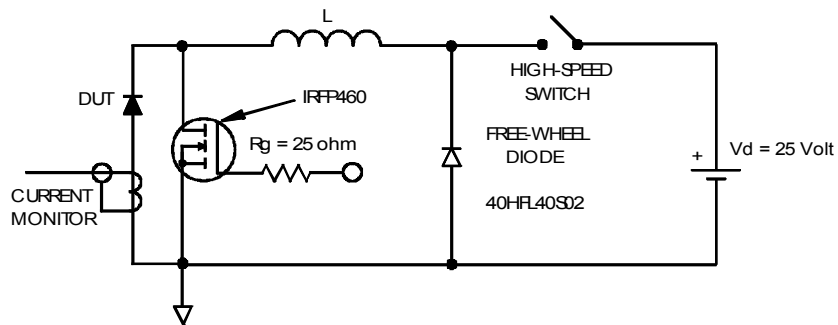


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
2. DIMENSIONS ARE SHOWN IN INCHES.
3. CONTOUR OF SLOTT OPTIONAL.
4. 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.
5. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
6. LEAD FINISH UNCONTROLLED IN L1.
7. #P TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC.

SYMBOL	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
A	MIN. .183	MAX. .209	MIN. 4.65	MAX. 5.31	
A1	MIN. .087	MAX. .102	MIN. 2.21	MAX. 2.59	
A2	MIN. .059	MAX. .098	MIN. 1.50	MAX. 2.49	
B	MIN. .039	MAX. .060	MIN. 0.99	MAX. 1.40	
b1	MIN. .039	MAX. .053	MIN. 0.99	MAX. 1.35	
b2	MIN. .065	MAX. .084	MIN. 1.65	MAX. 2.39	
b3	MIN. .060	MAX. .092	MIN. 1.60	MAX. 2.34	
b4	MIN. .102	MAX. .150	MIN. 2.59	MAX. 3.43	
b5	MIN. .102	MAX. .153	MIN. 2.59	MAX. 3.98	
c	MIN. .015	MAX. .030	MIN. 0.38	MAX. 0.89	
c1	MIN. .015	MAX. .025	MIN. 0.38	MAX. 0.64	
D	MIN. .178	MAX. .215	MIN. 18.71	MAX. 20.70	4
D1	MIN. .195	MAX. .220	MIN. 19.08	MAX. 21.35	5
D2	MIN. .200	MAX. .225	MIN. 19.30	MAX. 21.87	4
E	MIN. .320	MAX. .350	MIN. 31.48	MAX. 35.41	
E1	MIN. .178	MAX. .216	MIN. 18.52	MAX. 24.49	
a	MIN. .210 BSC	MAX. .236 BSC	MIN. 5.33	MAX. 6.01	
w	MIN. .010	MAX. .015	MIN. 0.25	MAX. 0.38	
L1	MIN. .209	MAX. .224	MIN. 19.30	MAX. 21.17	
L	MIN. .140	MAX. .164	MIN. 3.56	MAX. 4.17	
#P	MIN. .140	MAX. .144	MIN. 3.56	MAX. 3.66	
#P1	MIN. .209	MAX. .224	MIN. 5.31	MAX. 5.69	
S	MIN. .217 BSC	MAX. .243 BSC	MIN. 5.51	MAX. 6.17	

LEAD ASSIGNMENTS

HEXLET

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

OPTICAL SPACERS

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

DIGITS

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 40CPQ060
WITH LOT CODE 58 07
ASSEMBLED ON WW 35, 2000
IN THE ASSEMBLY LINE "H"

INTERNATIONAL
RECTIFIER
LOGO

40CPQ060

IRF 035H

58 07

PART NUMBER

DATE CODE
YEAR 0 = 2000
WEEK 35
LINE H

ASSEMBLY
LOT CODE

Ordering Information Table

Device Code					
40	C	P	Q	060	-
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

050 = 50V
060 = 60V

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.