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International IOR Rectifier

40L40CW
40L45CW

SCHOTTKY RECTIFIER

2 x 20 Amps

$I_{F(AV)} = 40\text{Amp}$
 $V_R = 40 - 45\text{V}$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	40 - 45	V
I_{FSM} @ tp = 5 μ s sine	1240	A
V_F @ 20 Apk, $T_J = 125^\circ\text{C}$ (per leg, Typical)	0.42	V
T_J	-55 to 150	$^\circ\text{C}$

Description/ Features

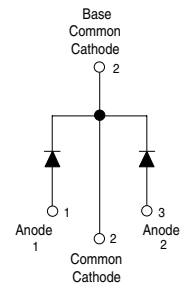
The 40L..CW center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies.

- 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



40L40CW, 40L45CW

Bulletin PD-20566 rev. C 10/06

International
ISOR Rectifier

Voltage Ratings

Part number	40L40CW	40L45CW
V_R Max. DC Reverse Voltage (V)	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	40L..CW	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	20 40	A	50% duty cycle @ $T_C = 122^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1240 350	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	20	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 3$ Amps, $L = 4.4$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	3	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	40L..CW		Units	Conditions	
	Typ.	Max.			
V_{FM} Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.48	0.53	V	@ 20A	$T_J = 25^\circ\text{C}$
	0.61	0.69	V	@ 40A	
	0.42	0.49	V	@ 20A	$T_J = 125^\circ\text{C}$
	0.60	0.70	V	@ 40A	
I_{RM} Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	-	1.5	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$
	20	80	mA	$T_J = 100^\circ\text{C}$	
$V_{F(TO)}$ Threshold Voltage	0.27		V	$T_J = T_J \text{ max.}$	
r_t Forward Slope Resistance	8.72		m Ω		
C_T Max. Junction Capacitance (Per Leg)	-	1500	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/ μs	(Rated V_R)	

Thermal-Mechanical Specifications

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Parameters	40L..CW	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)	1.6	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.8	$^\circ\text{C/W}$	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	40L40CW		
	40L45CW		

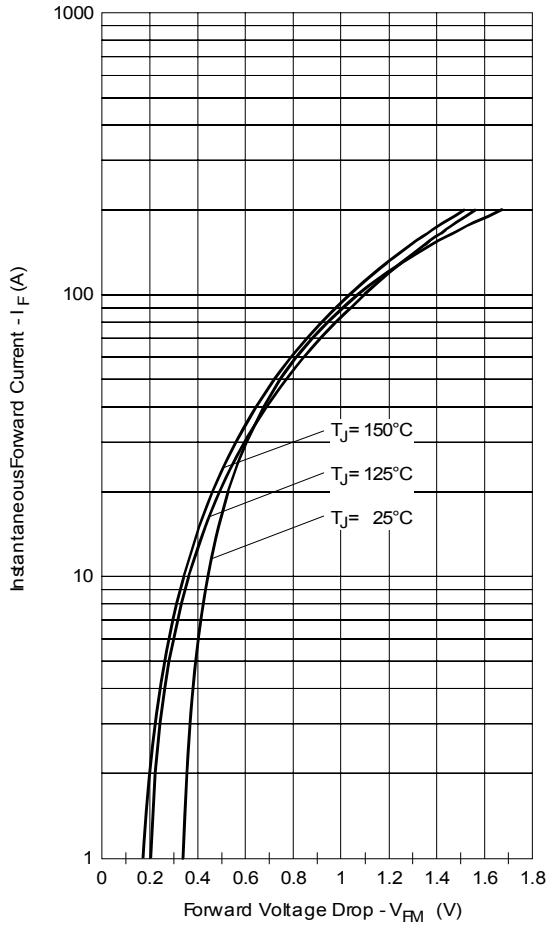


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

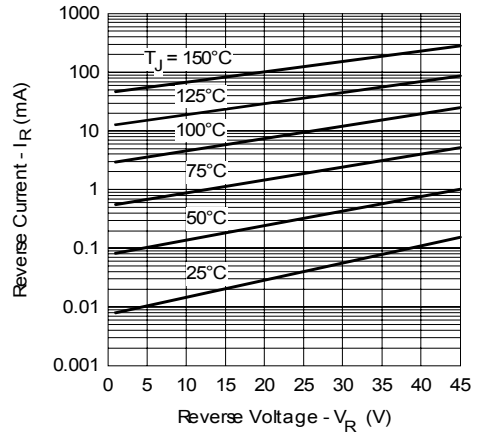


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

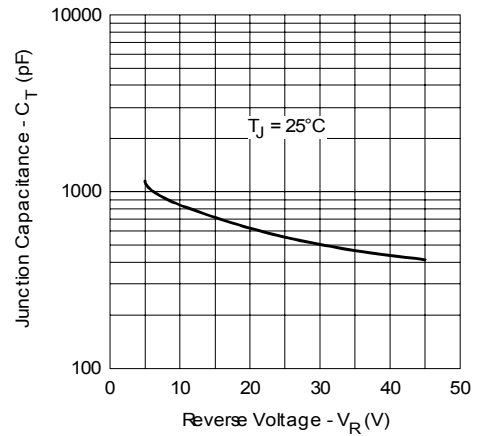


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

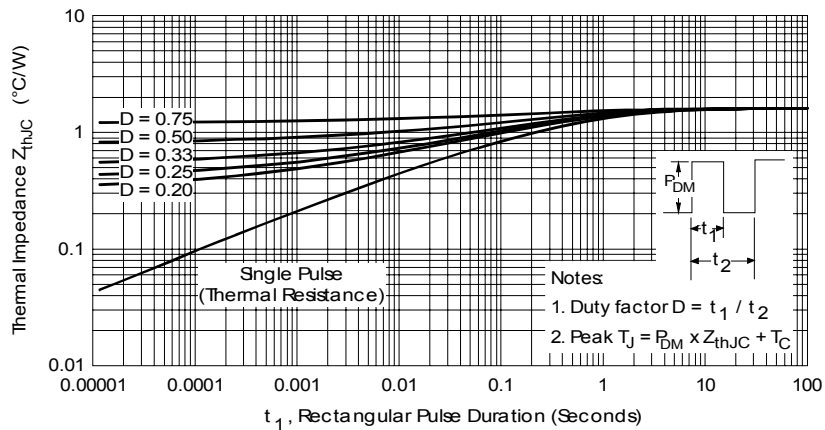


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

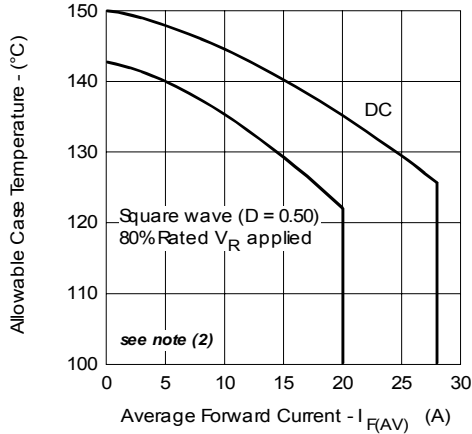


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

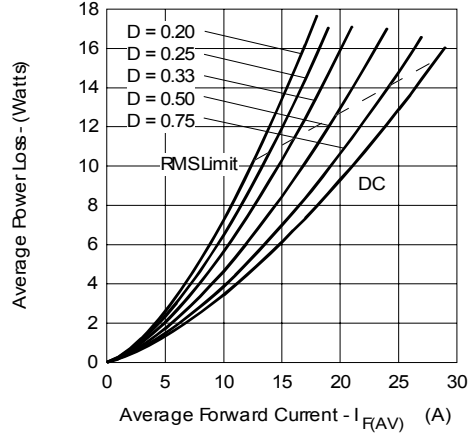


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

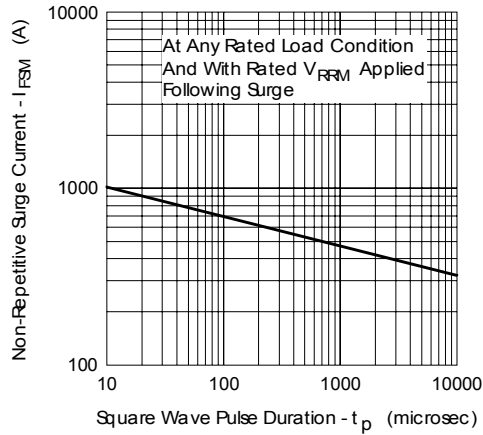


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

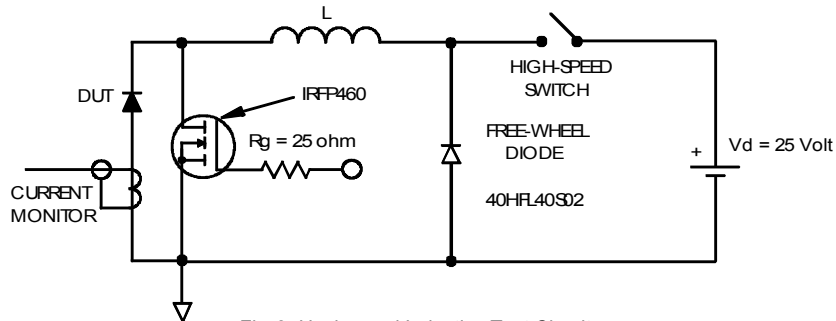


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$;

Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)}/D)$ (see Fig. 6);

Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

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 WELD FLASH. WELD 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 .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	.096	1.50	2.49	
B	.039	.050	0.99	1.40	
b1	.039	.055	0.99	1.35	
b2	.060	.094	1.50	2.39	
b3	.065	.092	1.65	2.34	
b4	.102	.135	2.59	3.43	
b5	.102	.133	2.59	3.38	
c	.015	.035	0.38	0.89	
c1	.015	.035	0.38	0.84	
D	.776	.815	19.71	20.70	4
D1	.515	-	13.08	-	5
D2	.020	.053	0.51	1.35	
E	.602	.625	15.29	15.87	4
E1	.530	-	13.46	-	
E2	.178	.216	4.52	5.49	
#	.215 BSC	-	5.45 BSC	-	
#1	.010	-	0.25	-	
L	.559	6.34	14.20	16.10	
L1	.146	.169	3.71	4.29	
#P	.140	.144	3.56	3.66	
#P1	-	.291	-	7.39	
Q	.209	.224	5.31	5.69	
S	.217 BSC	-	5.51 BSC	-	

LEAD ASSIGNMENTS

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

WELD COVERAGE

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

DIODES

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

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

VIEW B

VIEW A-A

CONFORM TO JEDEC OUTLINE TO-247AC (TO-3P)
 Dimensions in millimeters and (inches)

Marking Information

EXAMPLE: THIS IS A 40L45CW
 WITH LOT CODE 58 07
 ASSEMBLED ON WW 35, 2000
 IN THE ASSEMBLY LINE "H"

INTERNATIONAL
 RECTIFIER
 LOGO

ASSEMBLY
 LOT CODE

40L45CW
IOR 035H
 58 07

PART NUMBER

DATE CODE
 YEAR 0 = 2000
 WEEK 35
 LINE H

Ordering Information Table

Device Code					
40	L	45	C	W	-
(1)	(2)	(3)	(4)	(5)	(6)
1	-	Current Rating (40 = 40A)			
2	-	Schottky "L" Series			
3	-	Voltage Code			40 = 40V 45 = 45V
4	-	Circuit Configuration			
		C = Common Cathode			
5	-	Package			
		W = TO-247			
6	-	• none = Standard Production			
		• PbF = Lead-Free			
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.



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