

International IR Rectifier

40L40CWPbF 40L45CWPbF

SCHOTTKY RECTIFIER

2 x 20 Amps

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

Major Ratings and Characteristics

Characteristics	40L..CW	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

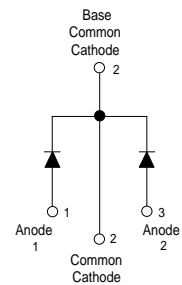
The 40L..CWPbF center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies.

- 150 $^\circ\text{C}$ 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
- Lead-Free ("PbF" suffix)

Case Styles



TO-247AC



Voltage Ratings

Partnumber	40L40CWPbF	40L45CWPbF
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 °C, rectangular wave form
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1240 350	A	5µs Sine or 3µs 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 °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 _{Jmax} . V _A = 1.5 x 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 °C
	0.61	0.69	V	@ 40A	
	0.42	0.49	V	@ 20A	T _J = 125 °C
	0.60	0.70	V	@ 40A	
I _{RM} Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	-	1.5	mA	T _J = 25 °C	V _R = rated V _R
	20	80	mA	T _J = 100 °C	
V _{F(TO)} Threshold Voltage	0.27		V	T _J = T _J max.	
r _t Forward Slope Resistance	8.72		mΩ		
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 < 300µs, Duty Cycle <2%

Parameters	40L..CW	Units	Conditions
T _J Max. Junction Temperature Range	-55 to 150	°C	
T _{stg} Max. Storage Temperature Range	-55 to 150	°C	
R _{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	1.6	°C/W	DC operation * See Fig. 4
R _{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.8	°C/W	DC operation
R _{thCS} Typical Thermal Resistance, Case to Heatsink	0.24	°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		

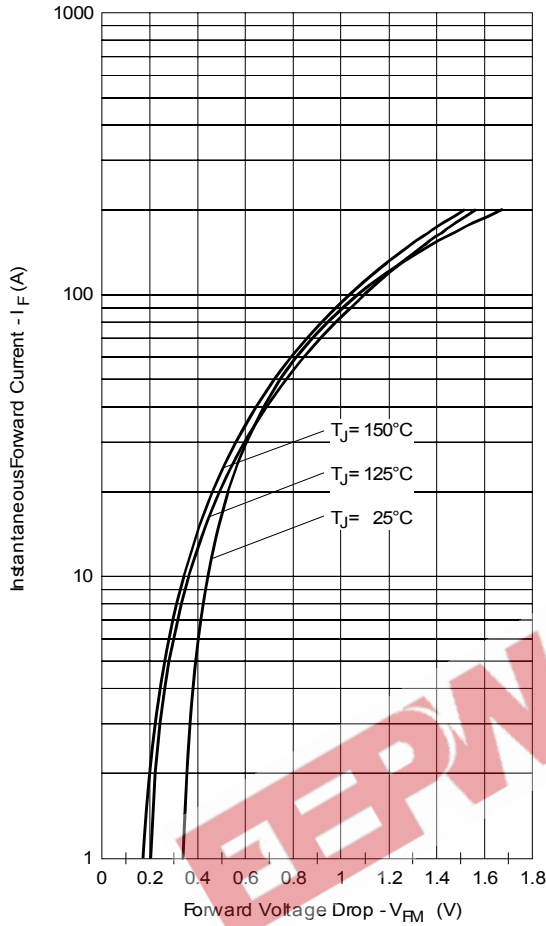


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

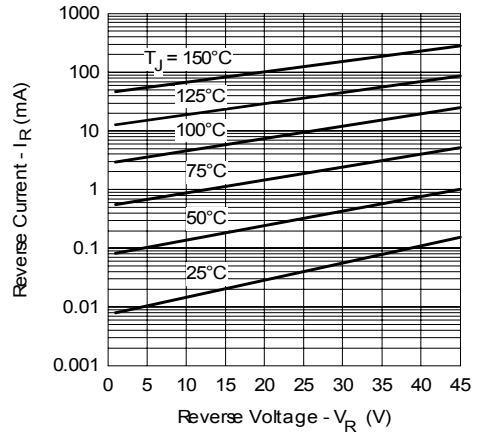


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

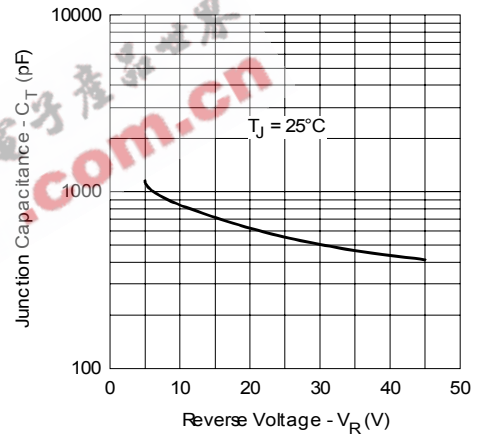


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

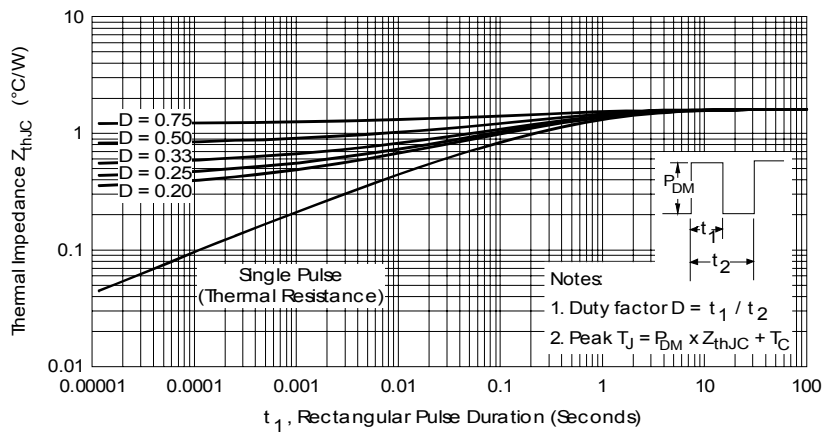


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

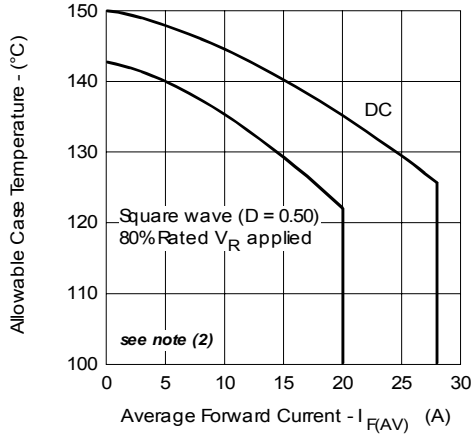


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

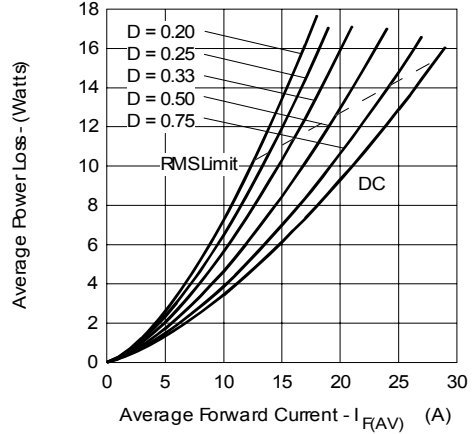


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

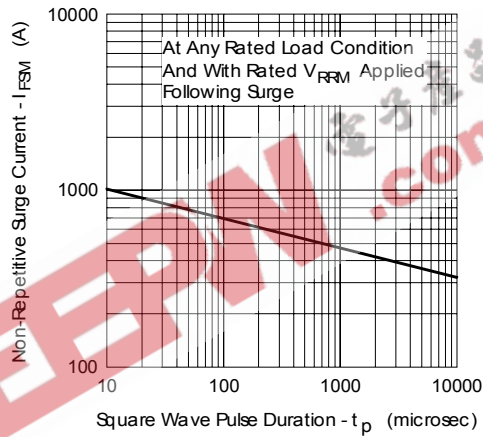


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

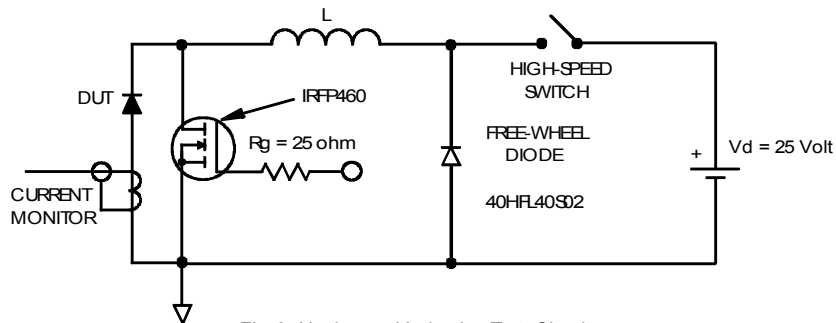


Fig. 8 - Unclamped Inductive Test Circuit

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

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

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

Outline Table

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
2. DIMENSIONS ARE SHOWN IN INCHES.
3. CONTOUR OF SLOT 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	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.183	.209	4.65	5.31	
A1	.087	.102	2.21	2.59	
A2	.009	.009	1.50	2.49	
b	.039	.055	0.99	1.40	
b1	.038	.053	0.99	1.35	
D2	.065	.094	1.65	2.39	
b3	.065	.082	1.65	2.14	
D4	.102	.153	2.59	3.43	
D5	.102	.153	2.59	3.38	
e	.075	.075	0.98	0.99	
e1	.075	.075	0.30	0.84	
D	.776	.815	19.71	20.73	4
D1	.315	-	13.08	-	5
D2	.070	.085	0.81	1.95	
E	.862	.925	19.29	19.87	4
E1	.520	-	13.46	-	
E2	.776	.716	4.52	5.43	
#	.219	BSC	5.49	BSC	
#P	.166	BSC	4.22	BSC	
L	.559	4.54	14.20	16.10	
L1	.166	.169	4.22	4.25	
WP	.140	.144	3.54	3.65	
WPH	-	.149	3.79	3.79	
Q	.200	.224	5.31	5.69	
S	.217	BSC	5.51	BSC	

LEAD ASSIGNMENTS

HEXSEI

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

IGBTs, CUPACK

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

DODDS

- 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 40L45CW
 WITH ASSEMBLY
 LOT CODE 5657
 ASSEMBLED ON WW 35, 2000
 IN ASSEMBLY LINE "H"

INTERNATIONAL
 RECTIFIER
 LOGO

40L45CW

IRF P035H

56 57

PART NUMBER

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

Ordering Information Table

Device Code					
40	L	45	C	W	PbF
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

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.