

# 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 $\mu$ 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

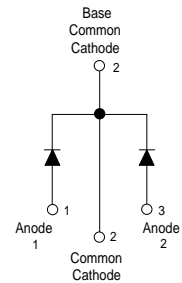
The 40L..CWPbF center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 $^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies.

- 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 @ $T_C = 122^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1240 350	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ 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 $\mu\text{sec}$ 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 $\Omega$		
$C_T$ Max. Junction Capacitance (Per Leg)	-	1500	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	10000		V/ $\mu\text{s}$	(Rated $V_R$ )	

## Thermal-Mechanical Specifications

(1) Pulse Width < 300 $\mu\text{s}$ , 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		

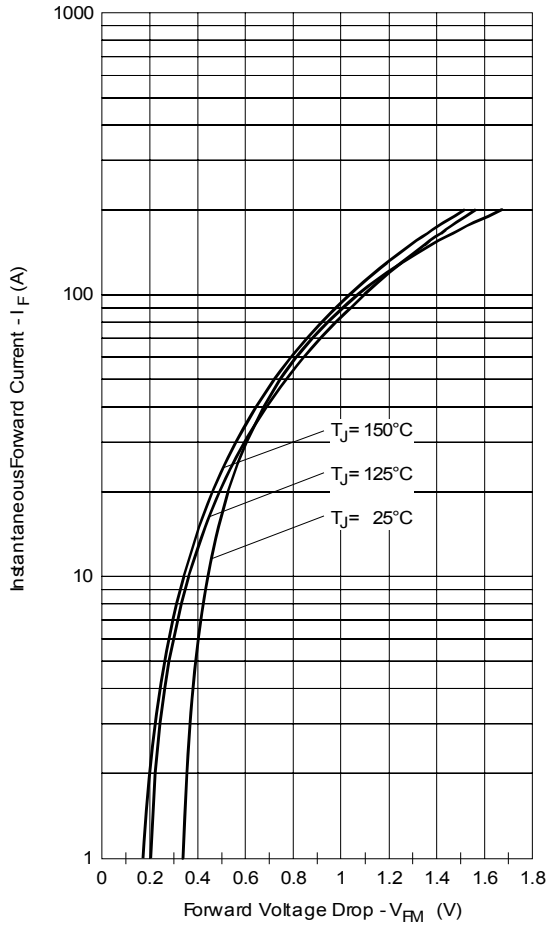


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

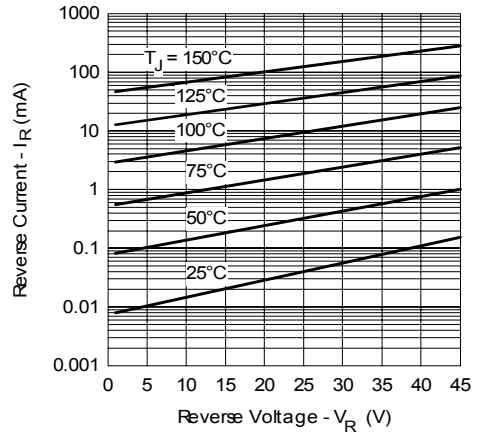


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

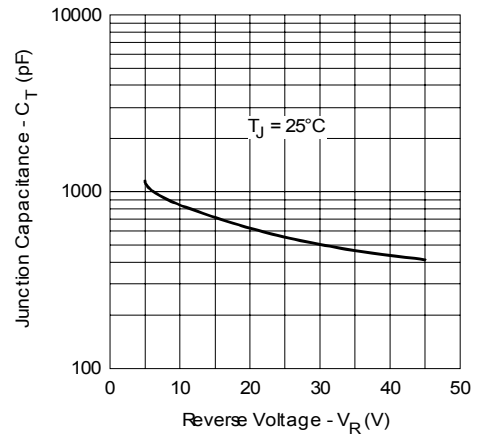


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

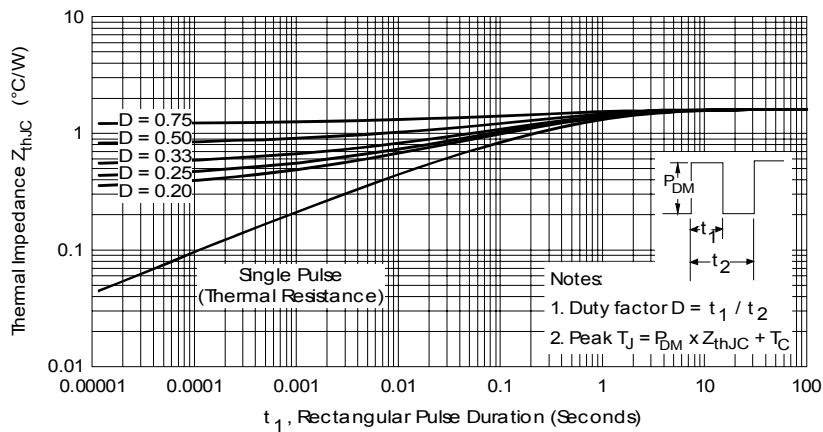


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

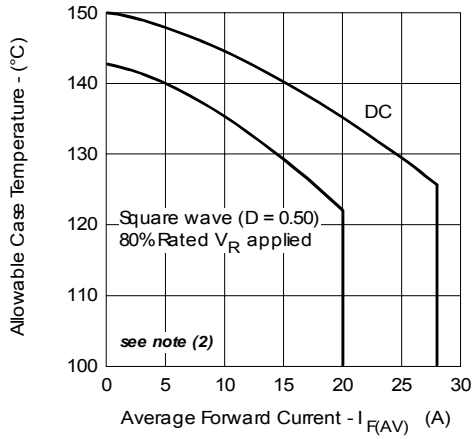


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

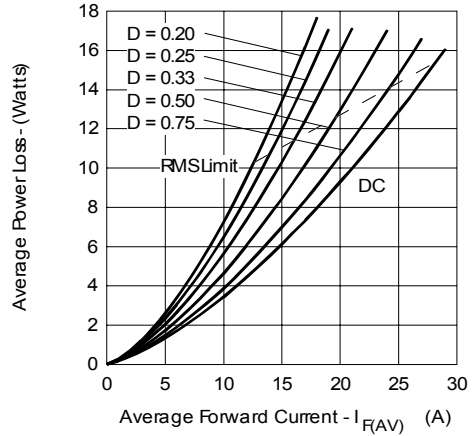


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

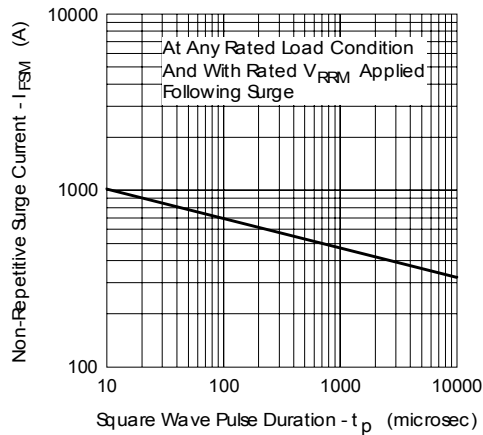


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

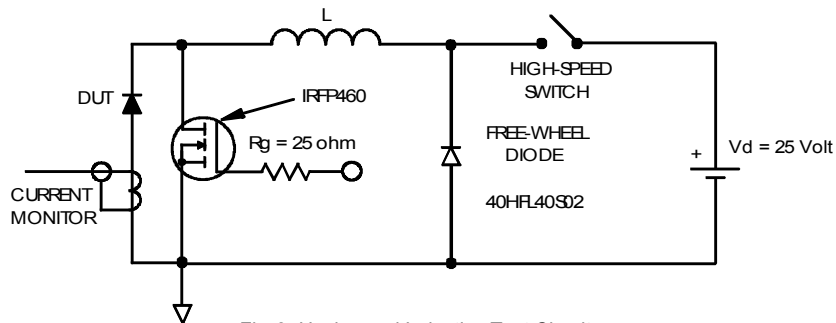


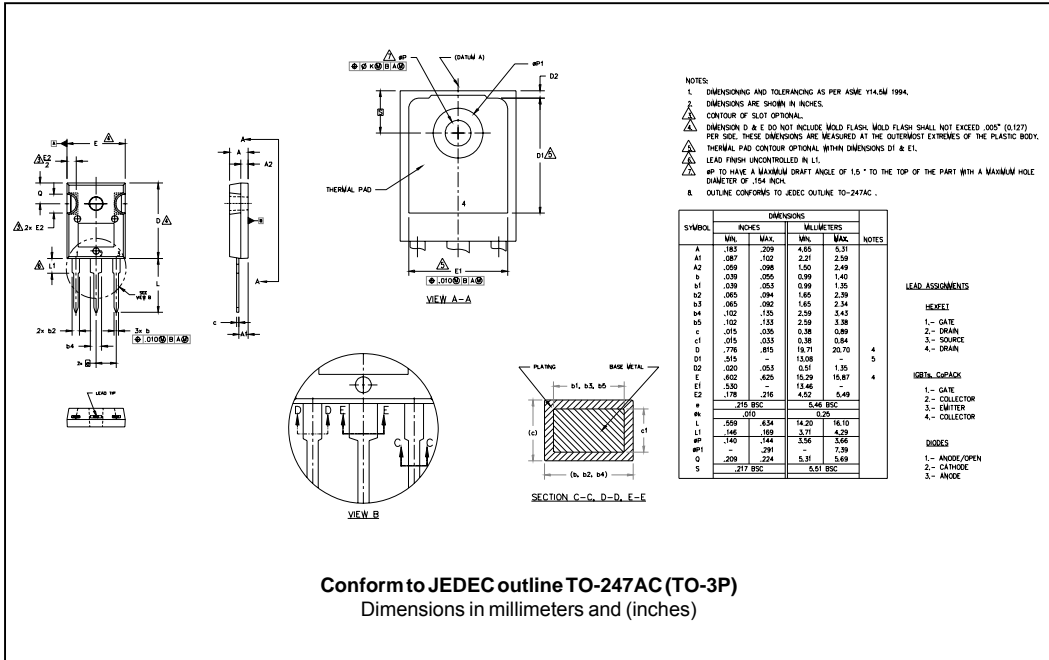
Fig. 8 - Unclamped Inductive Test Circuit

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

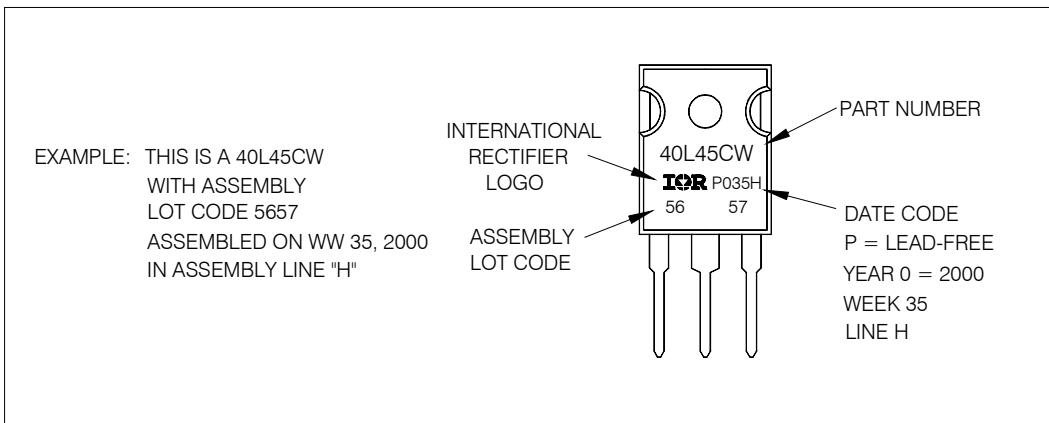
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)}/D)$  (see Fig. 6);

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

Outline Table



Marking Information



Ordering Information Table

Device Code					
40	L	45	C	W	PbF
①	②	③	④	⑤	⑥
<b>1</b>	- Current Rating (40 = 40A)				
<b>2</b>	- Schottky "L" Series				
<b>3</b>	- Voltage Code				40 = 40V 45 = 45V
<b>4</b>	- Circuit Configuration C = Common Cathode				
<b>5</b>	- Package W = TO-247				
<b>6</b>	- • 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 and Lead-Free.  
Qualification Standards can be found on IR's Web site.