Bulletin PD-20566 rev. B 07/02

International
IOR Rectifier

40L40CW
40L45CW

SCHOTTKY RECTIFIER

2 x 20 Amps

Major Ratings and Characteristics

Characteristics		40L..CW	Units
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		40 - 45	V
I_{FSM}	@tp = 5 µs sine	1240	A
V_F	@20 Apk, T_J=125°C (per leg, Typical)	0.42	V
T_J		- 55 to 150	°C

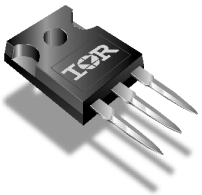
Description/ Features

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.

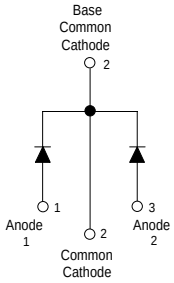
- 150° C T_J operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

40L..CW



TO-247AC



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 (Per Leg)	20	A	50% duty cycle @ T_C = 122 °C, rectangular wave form
	Current * See Fig. 5 (Per Device)	40		
I_{FSM}	Max. Peak One Cycle Non-Repetitive	1240	A	5µs Sine or 3µs Rect. pulse — Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	350		10ms Sine or 6ms Rect. pulse
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_J max. V_A = 1.5 x V_R typical

Electrical Specifications

	Parameters	40L..CW Typ.	40L..CW Max.	Units	Conditions	
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	-	1.5	mA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2 (1)	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)	

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

Thermal-Mechanical Specifications

	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)	Kg-cm (lbf-in)	Non-lubricated threads
		Max.	12 (10)		
	Case Style		TO-247AC(TO-3P)		JEDEC

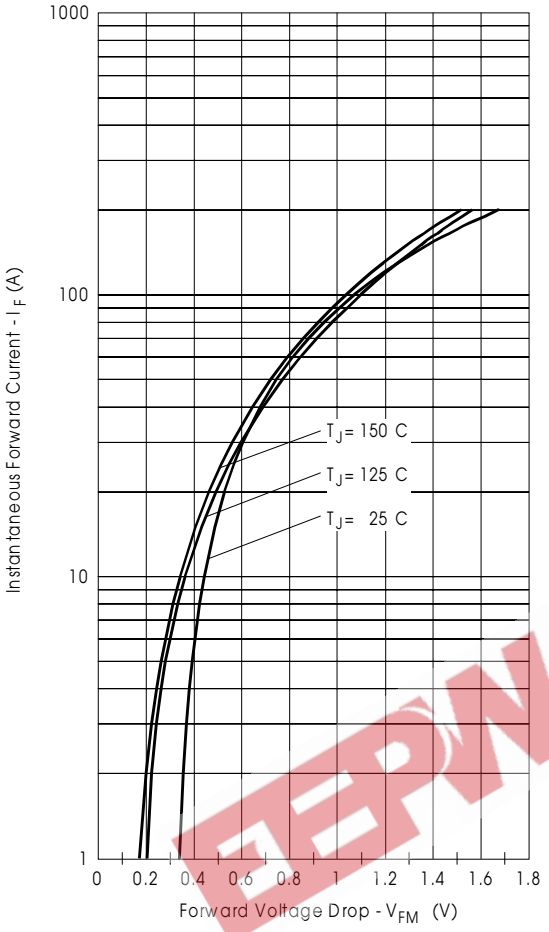


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

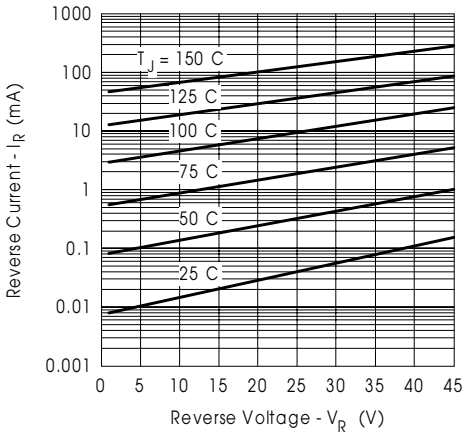


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

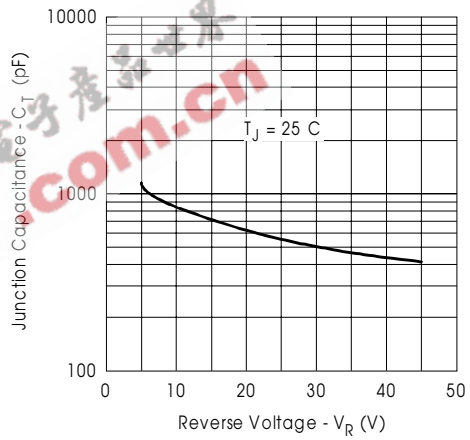


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

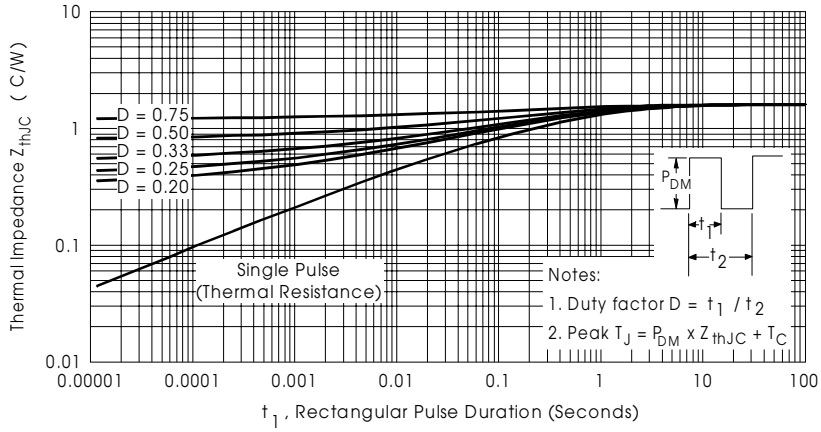


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

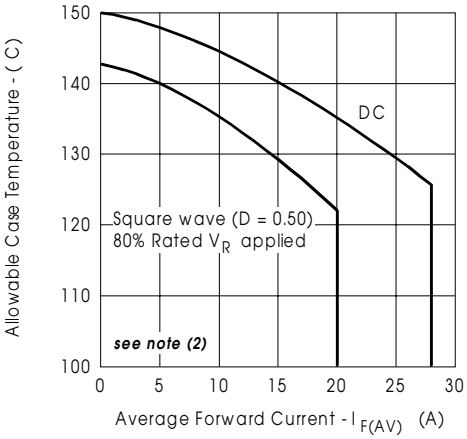


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

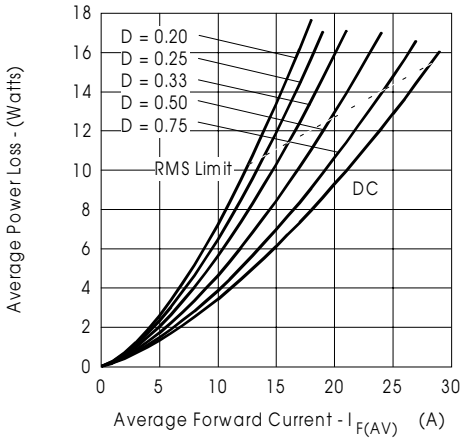


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

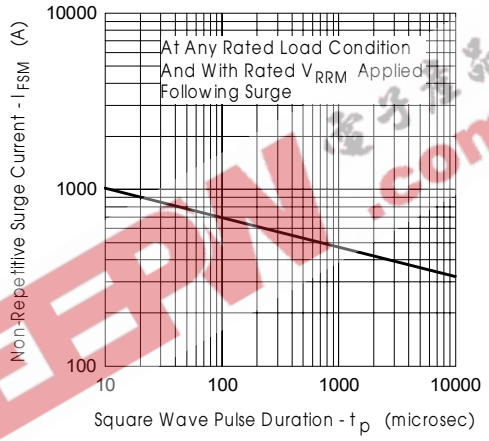


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

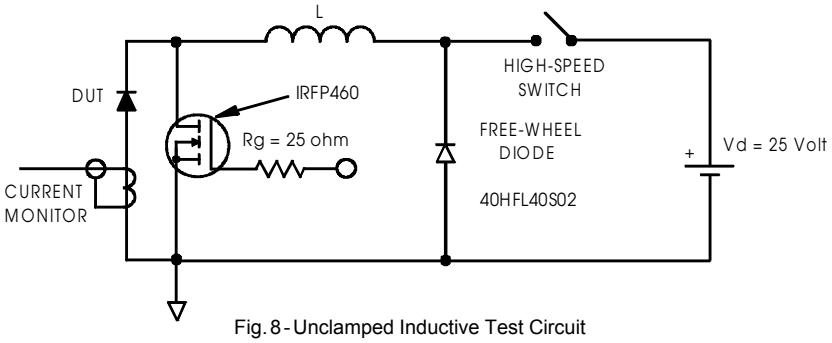
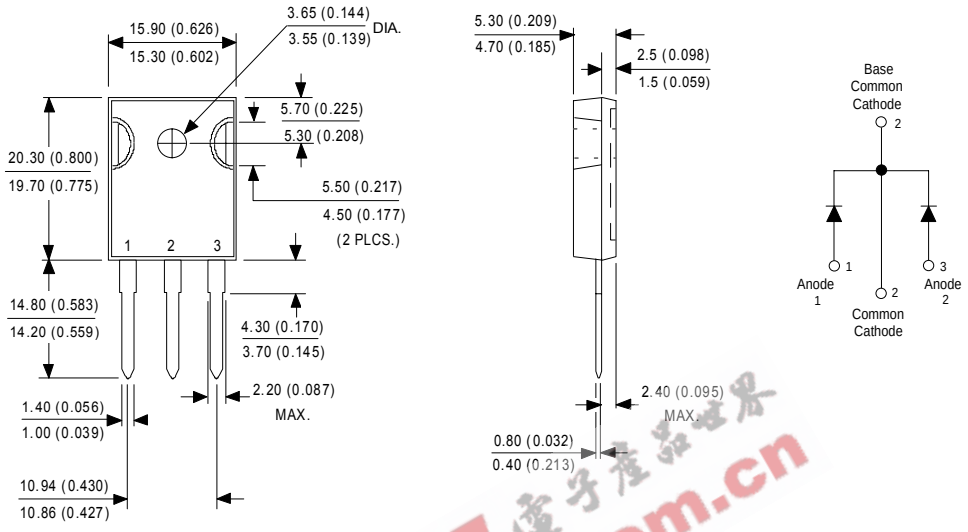


Fig. 8 - Unclamped Inductive Test Circuit

(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



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

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.

International
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