

International  
**IR** Rectifier

**30CPQ035**  
**30CPQ040**  
**30CPQ045**

**SCHOTTKY RECTIFIER**

**30 Amp**

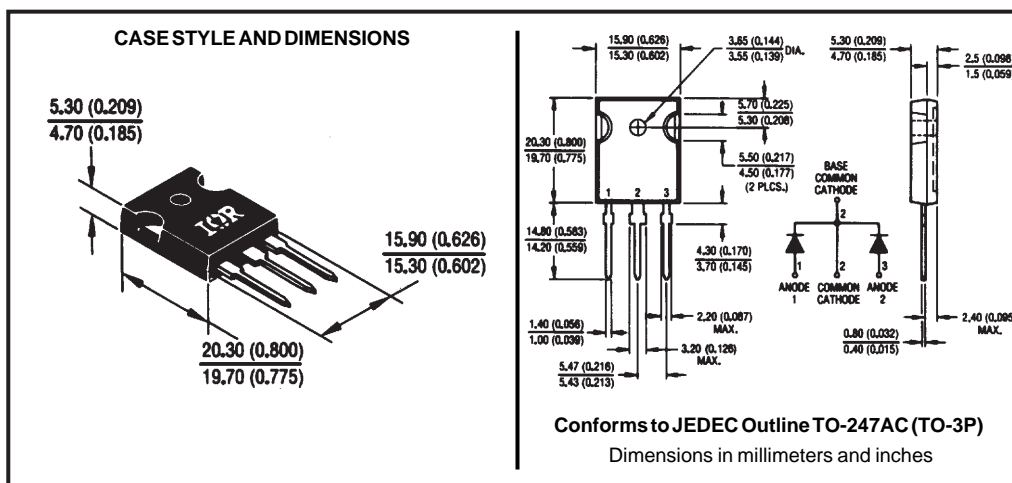
#### Major Ratings and Characteristics

Characteristics	30CPQ...	Units
$I_{F(AV)}$ Rectangular waveform	30	A
$V_{RRM}$	35/40/45	V
$I_{FSM}$ @ $t_p = 5 \mu s$ sine	1020	A
$V_F$ @ 15 Apk, $T_J = 125^\circ C$ (per leg)	0.50	V
$T_J$	-55 to 150	$^\circ C$

#### Description/Features

The 30CPQ... 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  $150^\circ C$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ C$   $T_J$  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



## Voltage Ratings

Part number	30CPQ035	30CPQ040	30CPQ045
$V_R$ Max. DC Reverse Voltage (V)	35	40	45
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

## Absolute Maximum Ratings

Parameters		30CPQ...	Units	Conditions		
I <sub>F(AV)</sub>	Max.AverageForwardCurrent * See Fig. 5	30	A	50% duty cycle @ T <sub>C</sub> = 124°C, rectangular wave form		
I <sub>FSM</sub>	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1020	A	5μs Sine or 3μs Rect. pulse	Following any rated load condition and with rated V <sub>RRM</sub> applied	
		265		10ms Sine or 6ms Rect. pulse		
E <sub>AS</sub>	Non-Repetitive Avalanche Energy (Per Leg)	20	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 3 Amps, L = 4.4 mH		
I <sub>AR</sub>	Repetitive Avalanche Current (Per Leg)	3	A	Current decaying linearly to zero in 1 μsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical		

## Electrical Specifications

Parameters		30CPQ...	Units	Conditions	
V <sub>FM</sub>	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.54	V	@ 15A	T <sub>J</sub> = 25 °C
		0.68	V	@ 30A	
		0.50	V	@ 15A	T <sub>J</sub> = 125 °C
		0.64	V	@ 30A	
I <sub>RM</sub>	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.75	mA	T <sub>J</sub> = 25 °C	V <sub>R</sub> = rated V <sub>R</sub>
		70	mA	T <sub>J</sub> = 125 °C	
C <sub>T</sub>	Max. Junction Capacitance (Per Leg)	900	pF	V <sub>R</sub> = 5V <sub>DC</sub> , (test signal range 100Khz to 1Mhz) 25°C	
L <sub>S</sub>	Typical Series Inductance (Per Leg)	7.5	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change (Rated V <sub>R</sub> )	10,000	V/ μs		

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

Parameters	30CPQ...	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)	2.20	$^\circ\text{C/W}$	DC operation * See Fig. 4
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	1.10	$^\circ\text{C/W}$	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)	Kg-cm (lbf-in)	Non-lubricated threads
	Max. 12(10)		
Case Style	TO-247AC(TO-3P)	JEDEC	

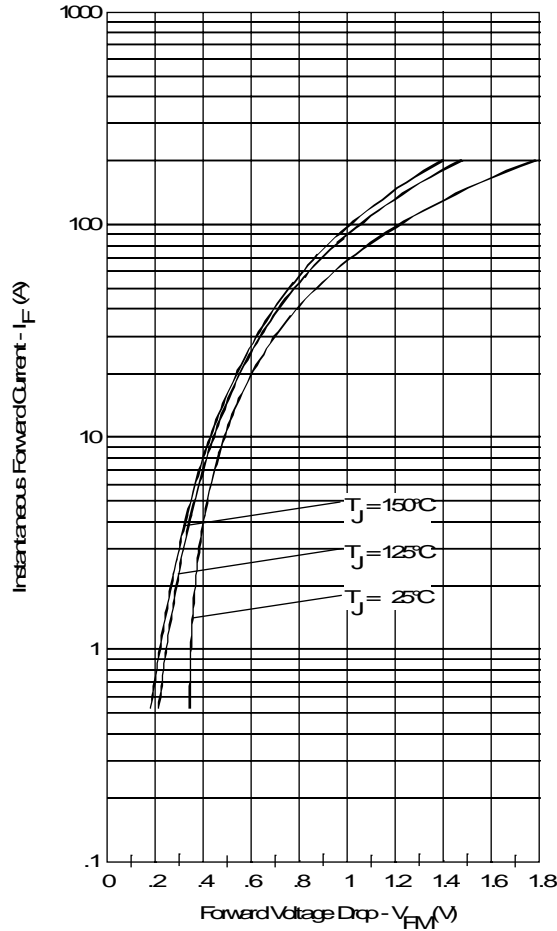


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

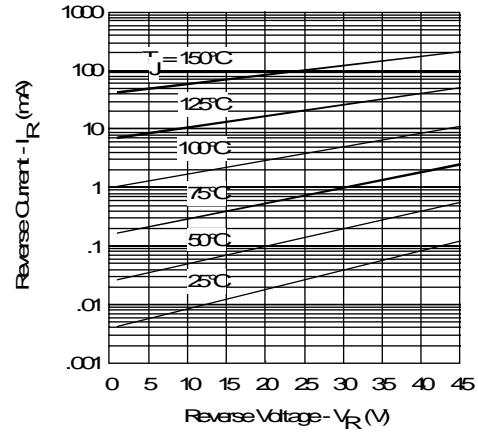


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

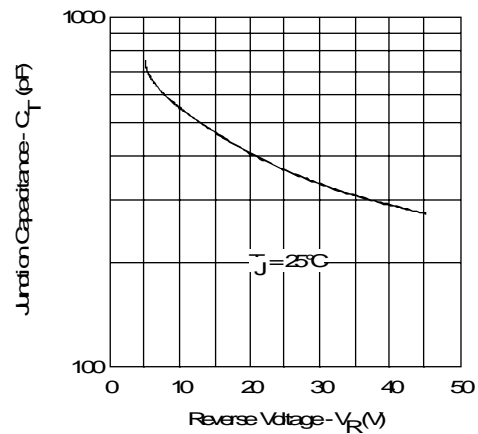


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

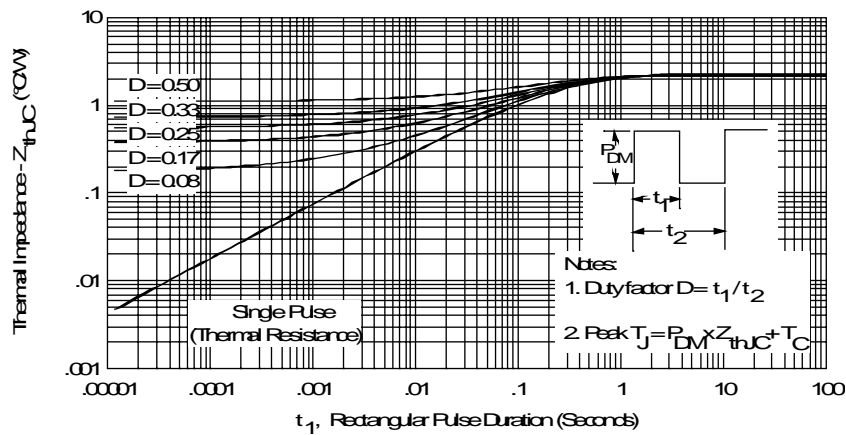


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

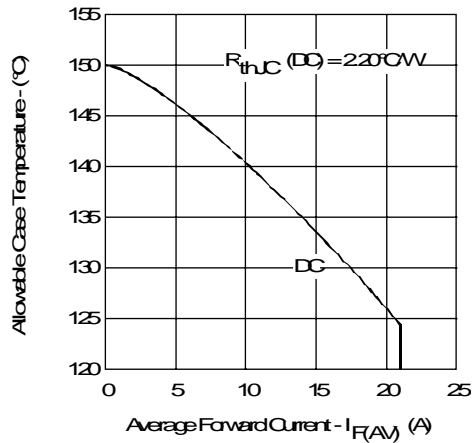


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

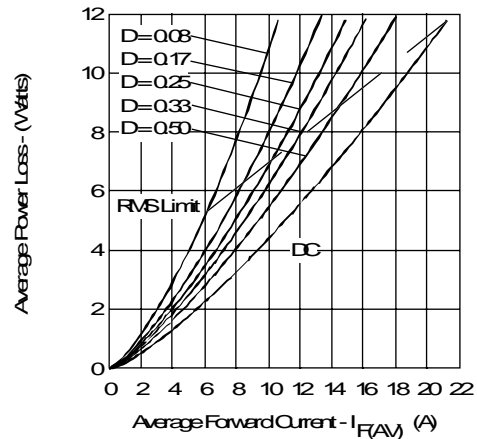


Fig. 6- Forward Power Loss Characteristics (Per Leg)

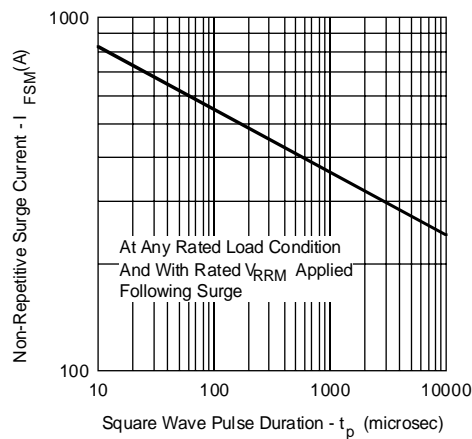


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

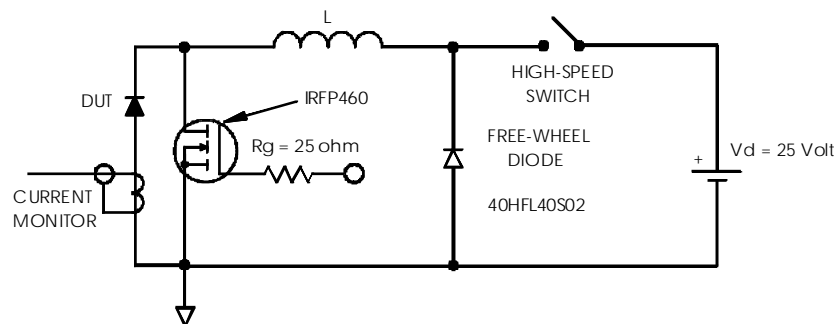


Fig. 8- Unclamped Inductive Test Circuit