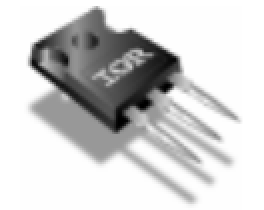
International
IOR Rectifier

80CPQ020

SCHOTTKY RECTIFIER

80 Amp



TO-247AC

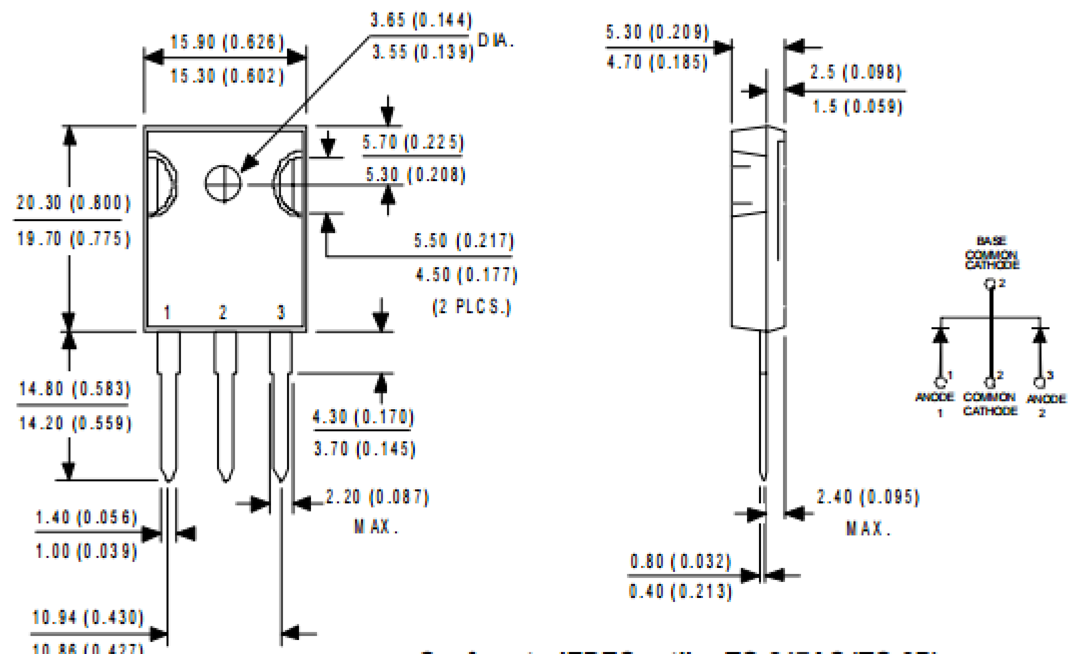
Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	80	A
V_{RRM}	20	V
I_{FSM} @ tp = 5 μs sine	2200	A
V_F @ 40Apk, T_J = 150°C (per leg)	0.32	V
T_J range	-55 to 150	°C

Description/Features

This center tap Schottky rectifier has been optimized for ultra low forward voltage drop specifically for 3.3V output power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 150 °C T_J operation
- Center tap configuration
- Optimized for 3.3V application
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance



Conform to JEDEC outline TO-247AC (TO-3P)

Dimensions in millimeters and inches

Voltage Ratings

	Part number	80CPQ020
V_R	Max. DC Reverse Voltage (V)	20

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current (Per Leg)	40	A	50% duty cycle @ T_C = 138°C, rectangular wave form	
	(Per Device)	80			
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)	2200	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		500		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	27	mJ	T_J = 25 °C, I_{AS} = 6 Amps, L = 1.5 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	6	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	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) (1)	0.46	V	@ 40A	T_J = 25 °C
		0.55	V	@ 80A	
		0.36	V	@ 40A	T_J = 125 °C
		0.46	V	@ 80A	
		0.32	V	@ 40A	T_J = 150 °C
		0.43	V	@ 80A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) (1)	5.5	mA	T_J = 25 °C	V_R = rated V_R
		1100	mA	T_J = 125 °C	
		110	mA	T_J = 125 °C	V_R = 5V
		600	mA	T_J = 150 °C	V_R = 10V
$V_{F(TO)}$	Threshold Voltage	0.185	V	T_J = T_J max.	
r_t	Forward Slope Resistance	3.2	mΩ		
C_T	Max. Junction Capacitance (Per Leg)	6500	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 (Rated V_R)	10,000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		Values	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)		0.6	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.3	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.25	°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)	
		Max.	12 (10)		
	Case Style		TO-247AC (TO-3P)		JEDEC

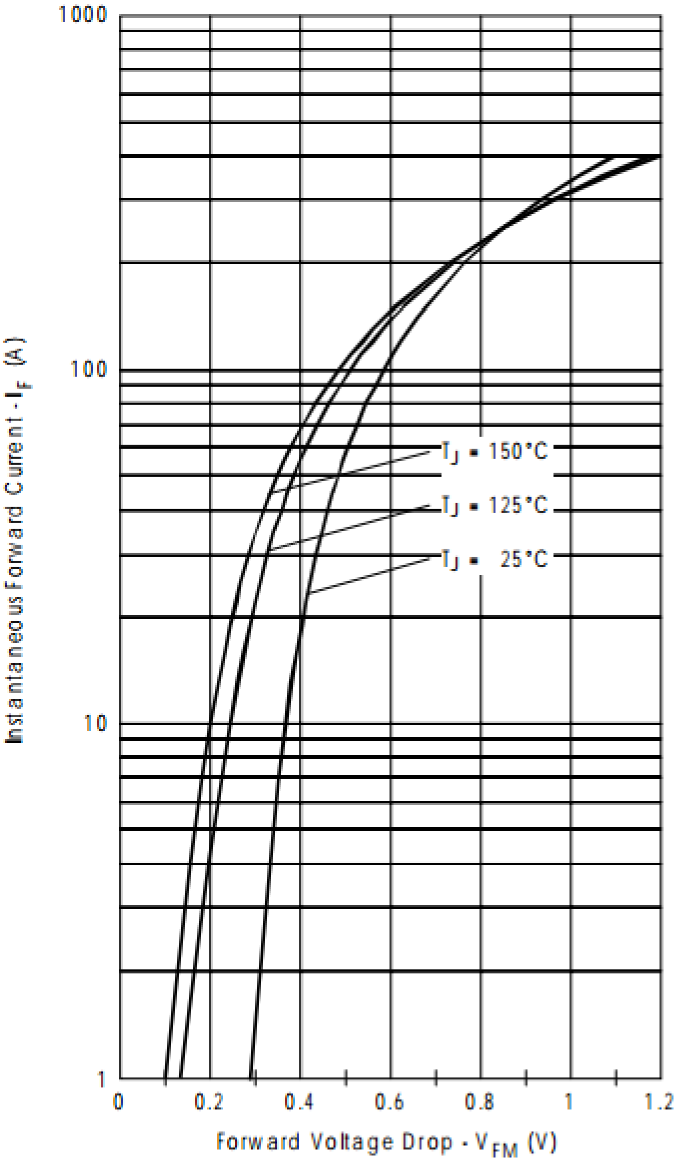


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

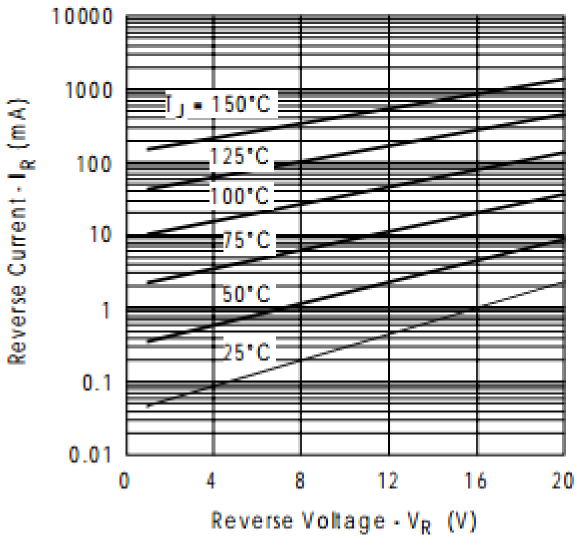


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

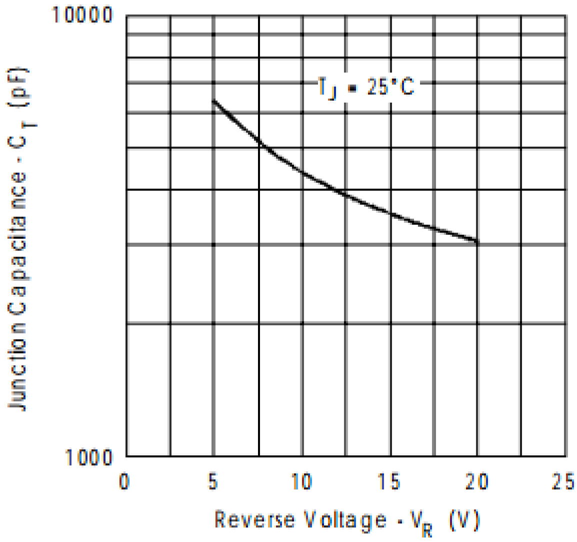


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

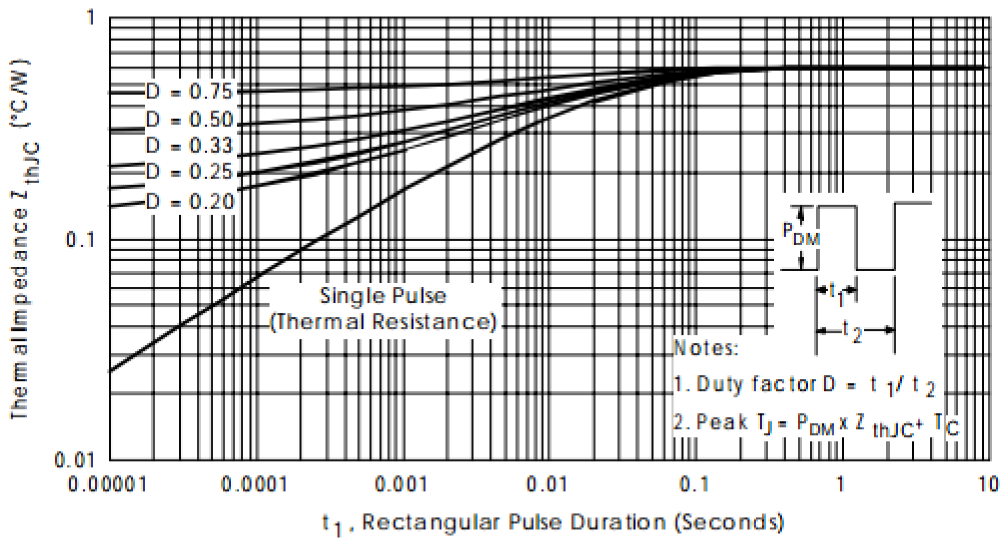


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

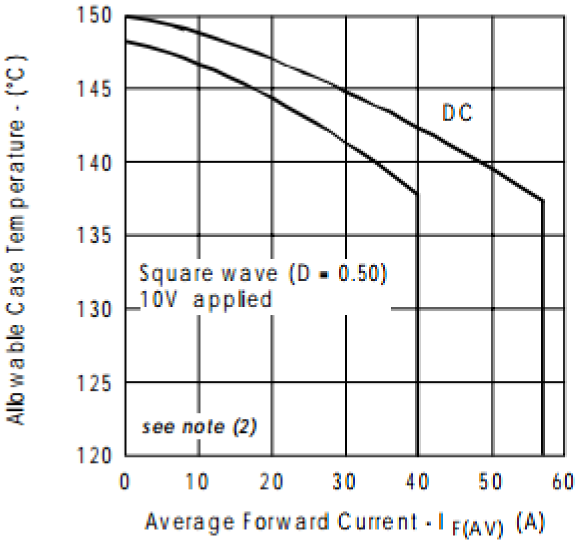


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

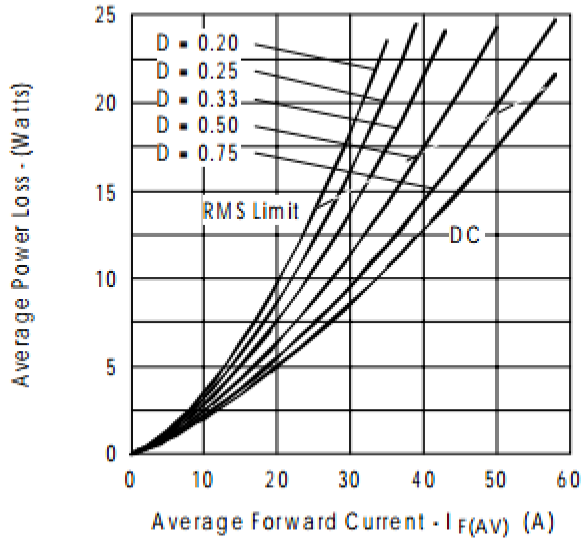


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

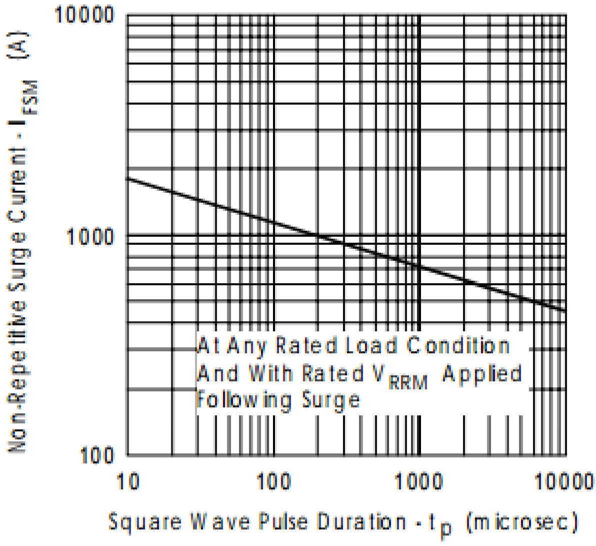


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

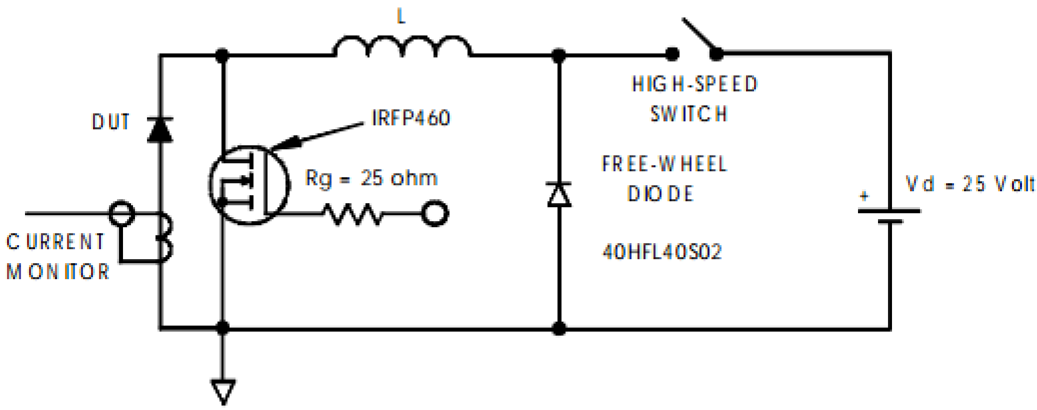


Fig. 8 - Unclamped Inductive Test Circuit

(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 @ $V_{R1} = 10V$