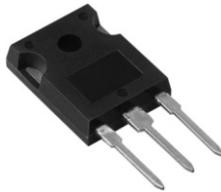
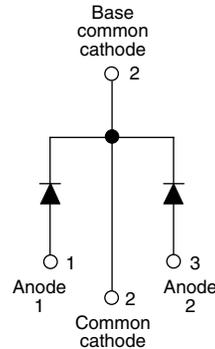


## Schottky Rectifier, 2 x 40 A


**TO-247AC**


### FEATURES

- 150 °C  $T_J$  operation
- Center tap configuration
- Optimized for 3.3 V 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
- Designed and qualified for industrial level

### DESCRIPTION

This center tap Schottky rectifier has been optimized for ultra low forward voltage drop specifically for 3.3 V 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.

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 40 A
$V_R$	20 V
$I_{RM}$	1100 mA at 125 °C

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
$V_{RRM}$		20	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	2200	A
$V_F$	40 Apk, $T_J = 150 \text{ °C}$ (per leg)	0.32	V
$T_J$	Range	- 55 to 150	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	80CPQ020	UNITS
Maximum DC reverse voltage	$V_R$	20	V

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg per device	$I_{F(AV)}$	50 % duty cycle at $T_C = 138 \text{ °C}$ , rectangular waveform	40	A
			80	
Maximum peak one cycle non-repetitive surge current per leg	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	2200
		10 ms sine or 6 ms rect. pulse		500
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25 \text{ °C}$ , $I_{AS} = 6 \text{ A}$ , $L = 1.5 \text{ mH}$	27	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	6	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg	$V_{FM}^{(1)}$	40 A	$T_J = 25\text{ }^\circ\text{C}$	0.46	V
		80 A		0.55	
		40 A	$T_J = 125\text{ }^\circ\text{C}$	0.36	
		80 A		0.46	
		40 A	$T_J = 150\text{ }^\circ\text{C}$	0.32	
		80 A		0.43	
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 125\text{ }^\circ\text{C}$	$V_R = 5\text{ V}$	110	mA
		$T_J = 150\text{ }^\circ\text{C}$	$V_R = 10\text{ V}$	600	
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	5.5	
		$T_J = 125\text{ }^\circ\text{C}$		1100	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.185	V
Forward slope resistance	$r_t$			3.2	m $\Omega$
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$		6500	pF
Typical series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body		7.5	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$			- 55 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation		0.6	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per package				0.3	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.25	
Approximate weight				6	g
				0.21	oz.
Mounting torque	minimum			6 (5)	kgf · cm
	maximum			12 (10)	(lbf · in)
Marking device		Case style TO-247AC (JEDEC)		80CPQ020	

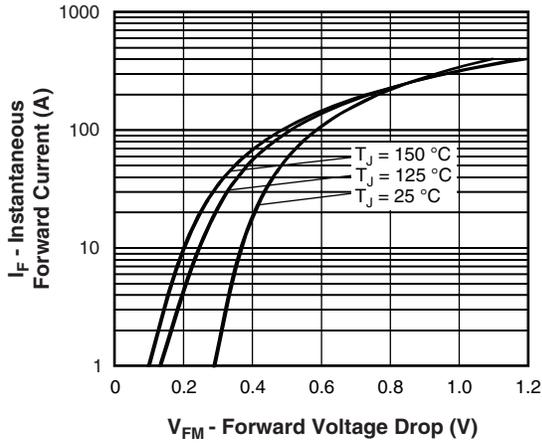


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

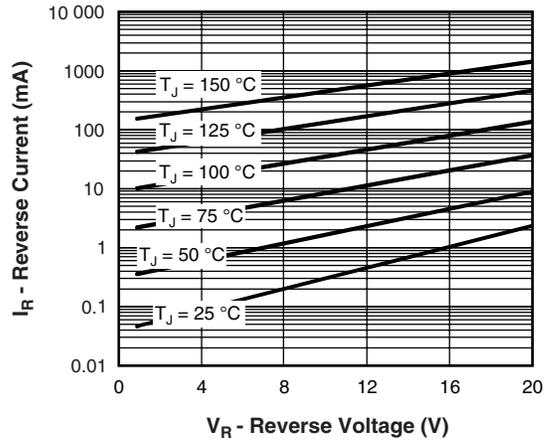


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

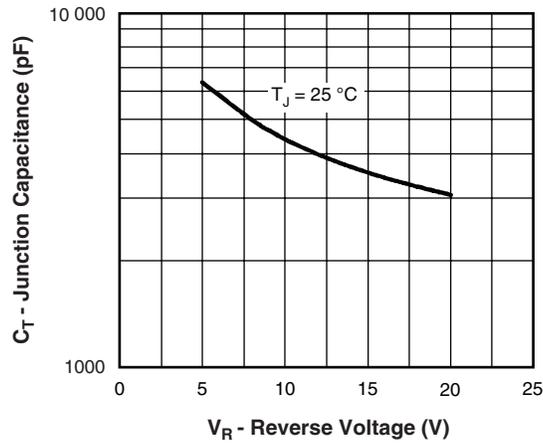
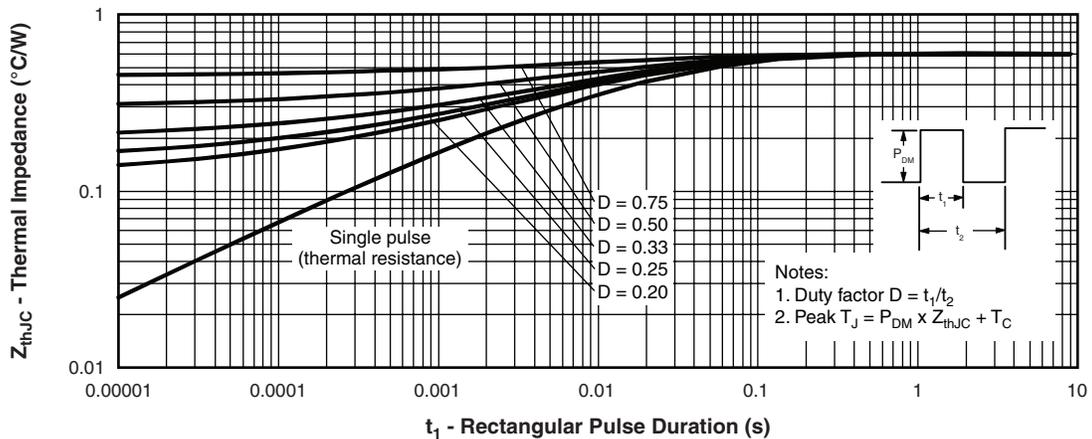


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)


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

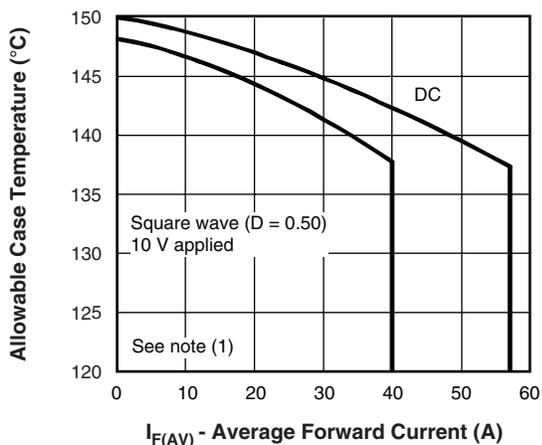


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

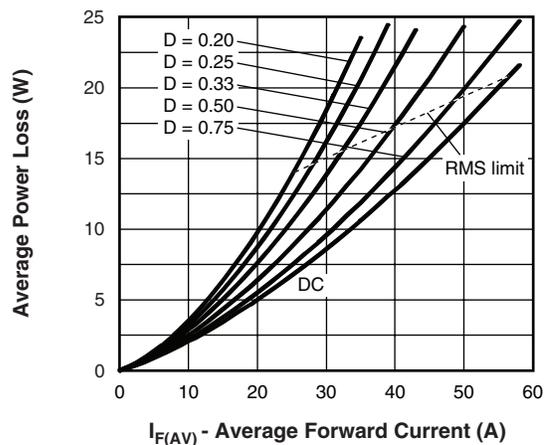


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

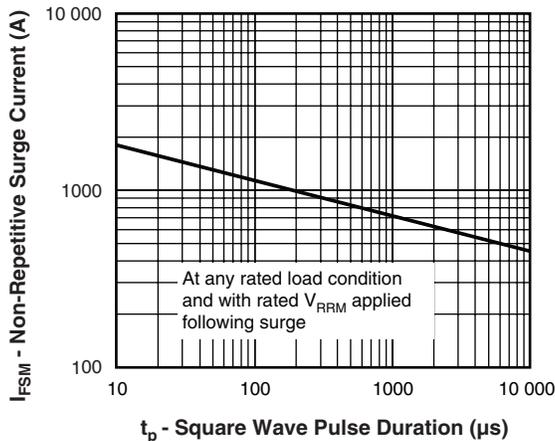


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

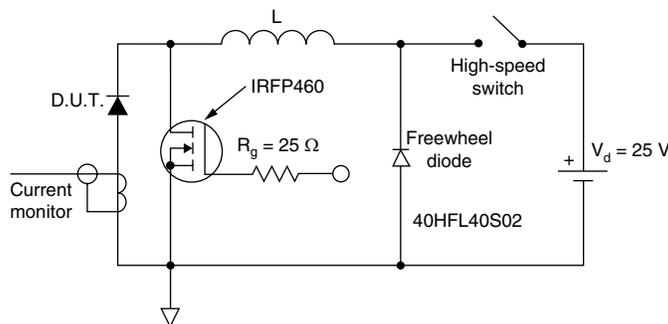


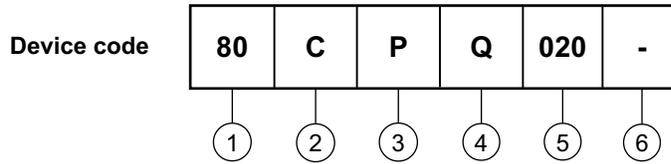
Fig. 8 - Unclamped Inductive Test Circuit

**Note**

- (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;
- $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);
- $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 10 V$



**ORDERING INFORMATION TABLE**



- 1** - Current rating (80 = 80 A)
- 2** - Circuit configuration:  
C = Common cathode
- 3** - Package:  
P = TO-247
- 4** - Schottky "Q" series
- 5** - Voltage code (020 = 20 V)
- 6** -
  - None = Standard production
  - PbF = Lead (Pb)-free

Tube standard pack quantity: 25 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95223">http://www.vishay.com/doc?95223</a>
Part marking information	<a href="http://www.vishay.com/doc?95226">http://www.vishay.com/doc?95226</a>
SPICE model	<a href="http://www.vishay.com/doc?95289">http://www.vishay.com/doc?95289</a>



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