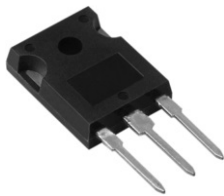




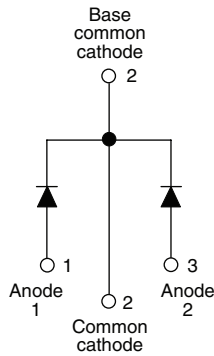
# 40CPQ080GPbF/40CPQ100GPbF

Vishay High Power Products

## Schottky Rectifier, 2 x 20 A



TO-247AC



### FEATURES

- 175 °C T<sub>J</sub> operation
- Center tap TO-247 package
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level



RoHS\*  
COMPLIANT

### DESCRIPTION

The 40CPQ...GPbF center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### PRODUCT SUMMARY

I <sub>F(AV)</sub>	2 x 20 A
V <sub>R</sub>	80/100 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I <sub>F(AV)</sub>	Rectangular waveform	40	A
V <sub>RRM</sub>		80/100	V
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	2950	A
V <sub>F</sub>	20 Apk, T <sub>J</sub> = 125 °C (per leg)	0.61	V
T <sub>J</sub>		- 55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	40CPQ080GPbF	40CPQ100GPbF	UNITS
Maximum DC reverse voltage	V <sub>R</sub>	80	100	V
Maximum working peak reverse voltage	V <sub>RWM</sub>			

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	I <sub>F(AV)</sub>	50 % duty cycle at T <sub>C</sub> = 145 °C, rectangular waveform	40	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I <sub>FSM</sub>	5 μs sine or 3 μs rect. pulse	2950	
		10 ms sine or 6 ms rect. pulse	300	
Non-repetitive avalanche energy per leg	E <sub>AS</sub>	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 A, L = 5.6 mH	11.25	mJ
Repetitive avalanche current per leg	I <sub>AR</sub>	Current decaying linearly to zero in 1 μs Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical	0.75	A

\* Pb containing terminations are not RoHS compliant, exemptions may apply

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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	20 A	$T_J = 25\text{ }^\circ\text{C}$	0.77	V
		40 A		0.91	
		20 A	$T_J = 125\text{ }^\circ\text{C}$	0.61	
		40 A		0.75	
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.27	mA
		$T_J = 125\text{ }^\circ\text{C}$		15	
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		600	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/ $\mu$ s

**Note**

(1) Pulse width < 300  $\mu$ 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 175	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation See fig. 4		1.25	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per package		DC operation		0.63	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.24	
Approximate weight				6	g
				0.21	oz.
Mounting torque	minimum	Non-lubricated threads		6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-247AC (JEDEC)	40CPQ080G	
				40CPQ100G	



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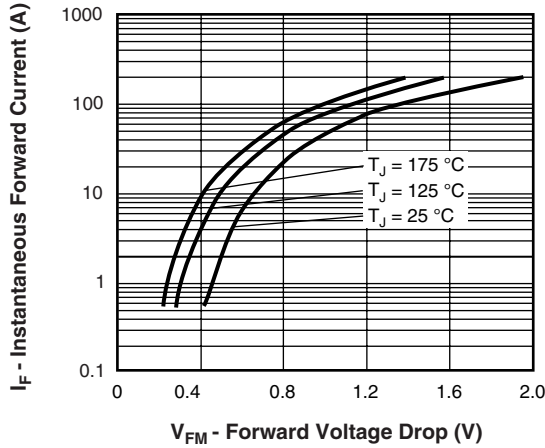


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

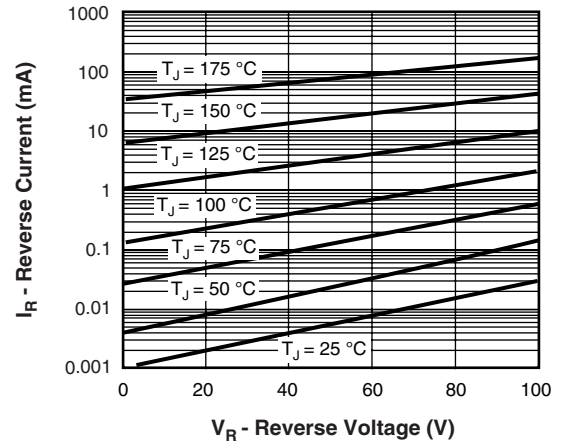


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

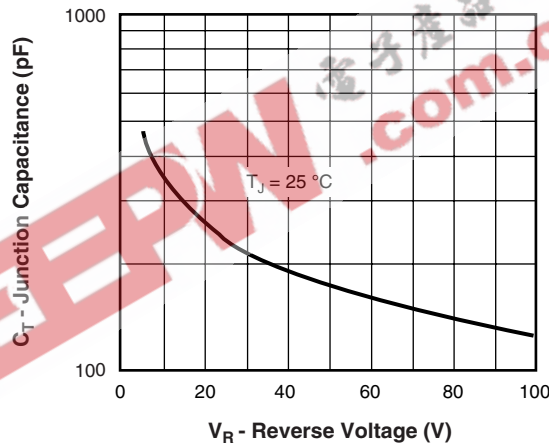


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

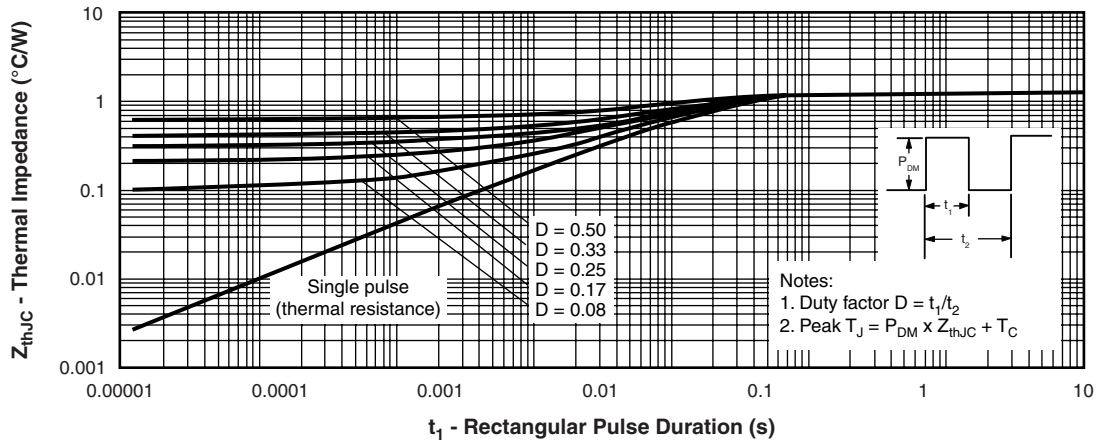


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

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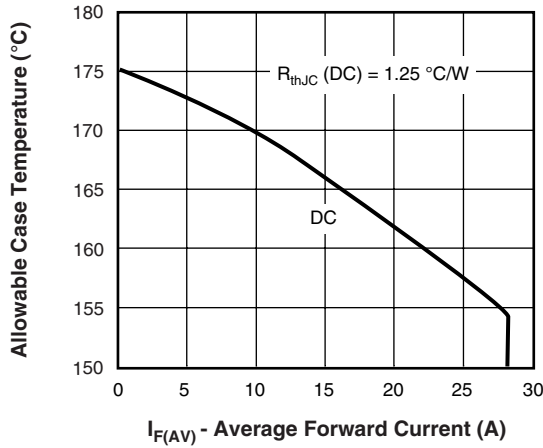


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

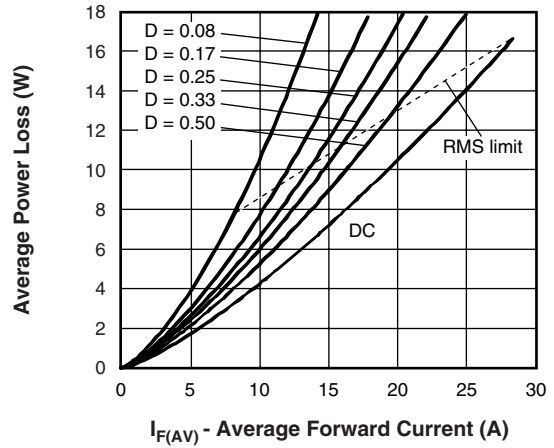


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

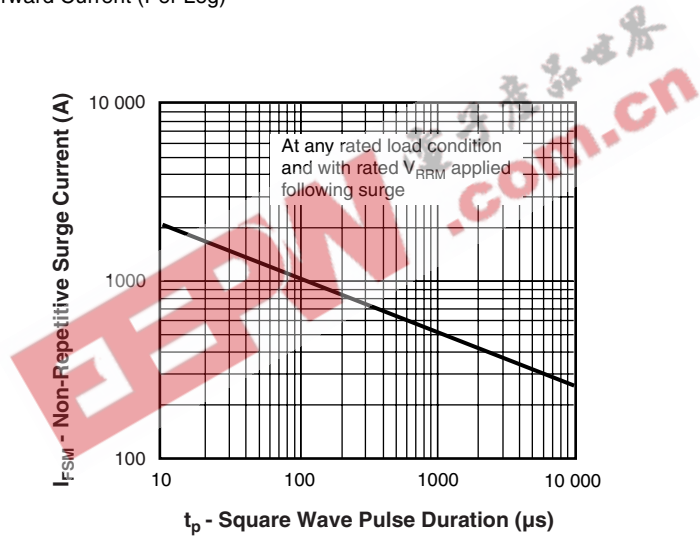


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

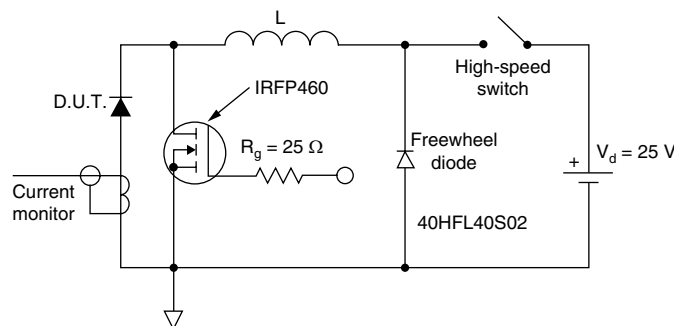


Fig. 8 - Unclamped Inductive Test Circuit



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## ORDERING INFORMATION TABLE

Device code	<b>40</b>	<b>C</b>	<b>P</b>	<b>Q</b>	<b>100</b>	<b>G</b>	<b>PbF</b>
	①	②	③	④	⑤	⑥	⑦
<b>1</b>	-	Current rating (40 = 40 A)					
<b>2</b>	-	Circuit configuration: C = Common cathode					
<b>3</b>	-	Package: P = TO-247					
<b>4</b>	-	Schottky "Q" series					
<b>5</b>	-	Voltage code					
<b>6</b>	-	G = Schottky generation					
<b>7</b>	-	• None = Standard production • PbF = Lead (Pb)-free					

080 = 80 V  
100 = 100 V

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>



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