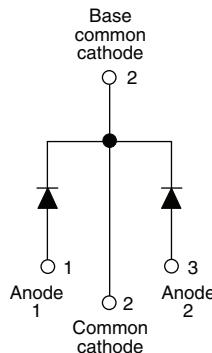


Schottky Rectifier, 2 x 20 A


TO-247AC


FEATURES

- 175 °C T_J 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...PbF 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

$I_{F(AV)}$	2 x 20 A
V_R	80/100 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		80/100	V
I_{FSM}	$t_p = 5 \mu s$ sine	2950	A
V_F	20 Apk, $T_J = 125^\circ C$ (per leg)	0.61	V
T_J		- 55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	40CPQ080PbF	40CPQ100PbF	UNITS
Maximum DC reverse voltage	V_R	80	100	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 145^\circ C$, rectangular waveform	40	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	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_{AS}	$T_J = 25^\circ C$, $I_{AS} = 2 A$, $L = 5.6 \text{ mH}$	11.25	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	0.75	A

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

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	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	1.25	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		15		
Maximum junction capacitance per leg	C_T	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		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/μs	

Note

(1) Pulse width < 300 μs, 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	°C	
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation See fig. 4		1.25	°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)		40CPQ080		
				40CPQ100		

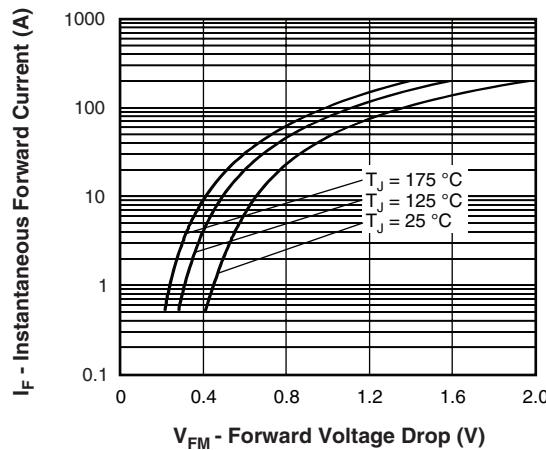


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

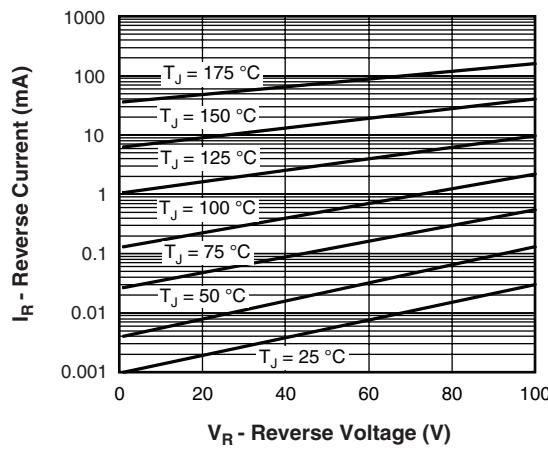


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

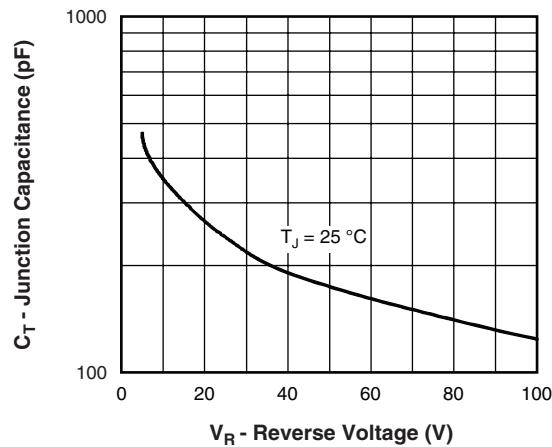


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

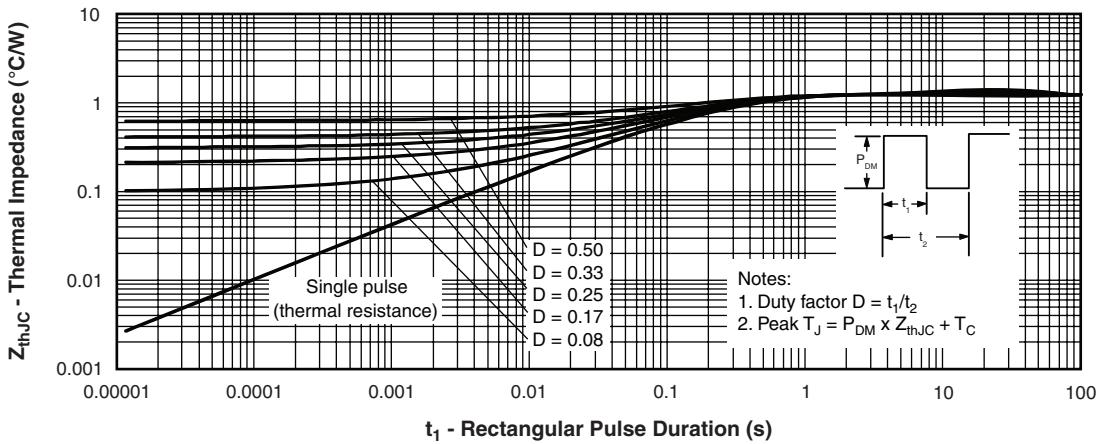


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

40CPQ080PbF/40CPQ100PbF

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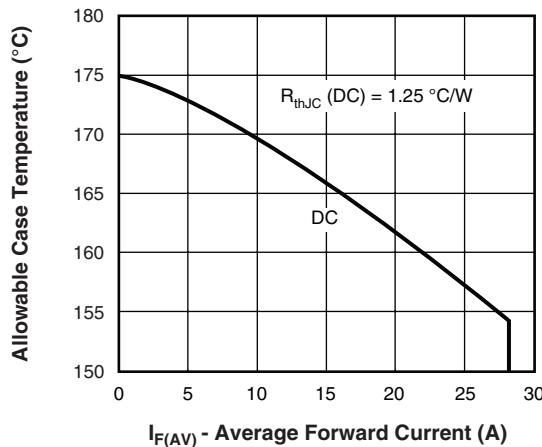


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

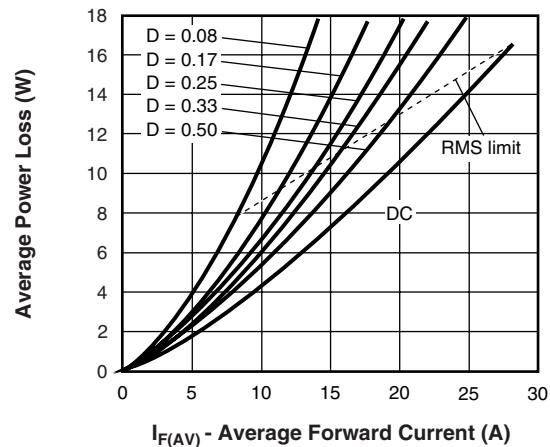


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

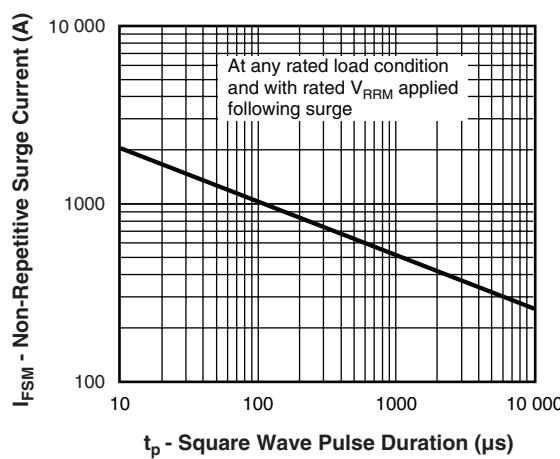


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

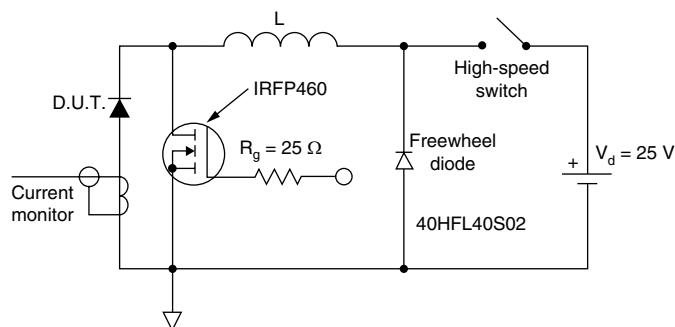


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code	40	C	P	Q	100	PbF
	1	2	3	4	5	6
1	-	Current rating (40 = 40 A)				
2	-	Circuit configuration:				
		C = Common cathode				
3	-	Package:				
		P = TO-247				
4	-	Schottky "Q" series				
5	-	Voltage code	080 = 80 V			
6	-	• None = Standard production	100 = 100 V			
		• PbF = Lead (Pb)-free				

Tube standard pack quantity: 25 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95223
Part marking information	http://www.vishay.com/doc?95226

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