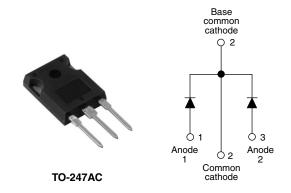


### Vishay High Power Products

### Schottky Rectifier, 2 x 20 A



PRODUCT SUMMARY				
I <sub>F(AV)</sub>	2 x 20 A			
$V_{R}$	50/60 V			

#### **FEATURES**

- 150 °C T<sub>J</sub> operation
- Center tap TO-247 package
- · Very 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
- Designed and qualified for industrial level

#### **DESCRIPTION**

The 40CPQ... 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 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES	UNITS		
I <sub>F(AV)</sub>	Rectangular waveform	40	Α		
V <sub>RRM</sub>		50/60	V		
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	3200	Α		
V <sub>F</sub>	20 Apk, T <sub>J</sub> = 125 °C (per leg)	0.49	V		
T <sub>J</sub>		- 55 to 150	°C		

VOLTAGE RATINGS				
PARAMETER	SYMBOL	40CPQ050	40CPQ060	UNITS
Maximum DC reverse voltage	$V_{R}$	50	60	V
Maximum working peak reverse voltage	$V_{RWM}$	50	00	v

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> = 120 °C, rectangular waveform		40	
Maximum peak one cycle		5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	3200	Α
non-repetitive surge current per leg See fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	V <sub>RRM</sub> applied	320	
Non-repetitive avalanche energy per leg	E <sub>AS</sub>	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 2 A, L = 9.0 mH		18	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		2	Α

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## 40CPQ050/40CPQ060

# Vishay High Power Products Schottky Rectifier, 2 x 20 A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	V <sub>FM</sub> <sup>(1)</sup>	20 A	T <sub>J</sub> = 25 °C	0.53	V
		40 A		0.68	
		20 A	T <sub>J</sub> = 125 °C	0.49	
		40 A		0.64	
Maximum reverse leakage current per leg	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V <sub>B</sub> = Rated V <sub>B</sub>	1.7	mA
See fig. 2		T <sub>J</sub> = 125 °C	VR = nateu VR	96	IIIA
Maximum junction capacitance per leg	C <sub>T</sub>	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		1600	pF
Typical series inductance per leg	L <sub>S</sub>	Measured lead to lead 5 mm from package body		7.5	nΗ
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>		10 000	V/µs

#### Note

 $<sup>^{(1)}</sup>$  Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction and storage temperature range		T <sub>J</sub> , T <sub>Stg</sub>		- 55 to 150	°C	
Maximum thermal resistance, junction to case per leg		В	DC operation See fig. 4	1.25		
Maximum thermal resistance, junction to case per package		$R_{thJC}$	DC operation	0.63	°C/W	
Typical thermal resistance, case to heatsink		R <sub>thCS</sub>	Mounting surface, smooth and greased	0.24		
Approximate weight				6	g	
Approximate weight				0.21	OZ.	
Mounting torque —	minimum		Niew lubyinatad thuranda	6 (5)	kgf · cm (lbf · in)	
	maximum		Non-lubricated threads	12 (10)		
			On a state TO 04740 (JEDEO)	40CP	40CPQ050	
Marking device			Case style TO-247AC (JEDEC)	40CP	40CPQ060	

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## Schottky Rectifier, 2 x 20 A Vishay High Power Products

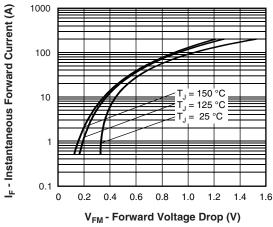


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

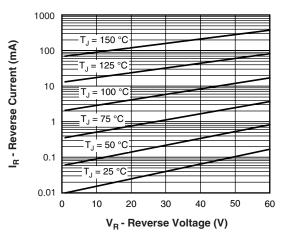


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

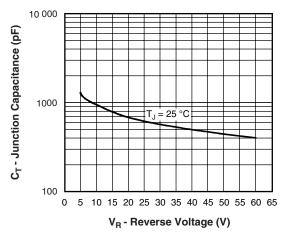


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

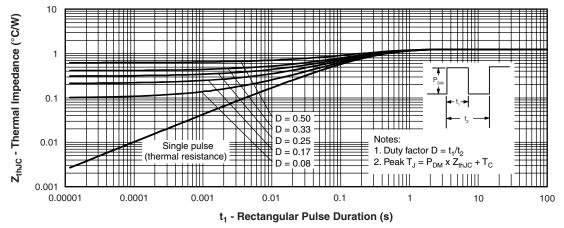


Fig. 4 - Maximum Thermal Impedance Z<sub>thJC</sub> Characteristics (Per Leg)

# Vishay High Power Products Schottky Rectifier, 2 x 20 A



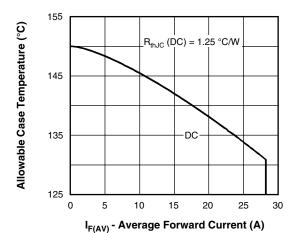


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

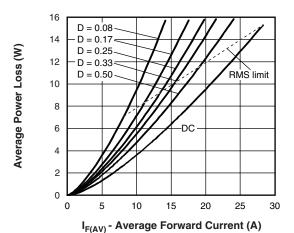


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

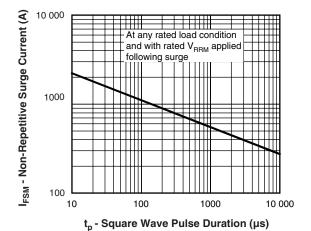


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

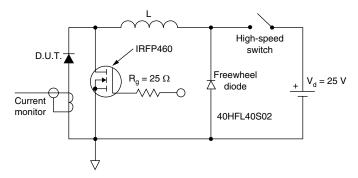


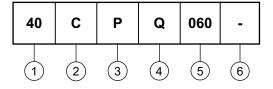
Fig. 8 - Unclamped Inductive Test Circuit



# Schottky Rectifier, 2 x 20 A Vishay High Power Products

#### **ORDERING INFORMATION TABLE**





1 - Current rating (40 = 40 A)

2 - Circuit configuration:

C = Common cathode

3 - Package:

P = TO-247

4 - Schottky "Q" series

- Voltage code 050 = 50 V 060 = 60 V

None = Standard production

• 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			

Document Number: 93337 Revision: 21-Aug-08



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Document Number: 91000 Revision: 18-Jul-08