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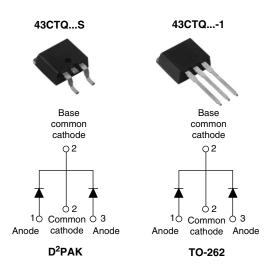
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### Vishay High Power Products

### Schottky Rectifier, 2 x 20 A



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

#### **FEATURES**

- 175 °C T<sub>J</sub> operation
- Center tap configuration
- · Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for AEC-Q101 level

#### **DESCRIPTION**

This center tap Schottky rectifier series 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, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	CHARACTERISTICS VALUES			
I <sub>F(AV)</sub>	Rectangular waveform	40	А		
V <sub>RRM</sub>		80/100	V		
I <sub>FSM</sub>	$t_p = 5 \mu s sine$	850	Α		
V <sub>F</sub>	20 Apk, T <sub>J</sub> = 125 °C (per leg)	0.67	V		
T <sub>J</sub>	Range	- 55 to 175	°C		

VOLTAGE RATINGS				
PARAMETER SYMBOL		43CTQ080S 43CTQ080-1	43CTQ100S 43CTQ100-1	UNITS
Maximum DC reverse voltage	$V_R$	80	100	V
Maximum working peak reverse voltage	$V_{RWM}$	60	100	V

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average per leg		50 % duty cycle at $T_C$ = 135 °C, rectangular waveform		20	
See fig. 5 per device	I <sub>F(AV)</sub>			40	A
Maximum peak one cycle non-repetitive surge current per leg	1	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V <sub>RRM</sub> applied	850	
See fig. 7	I <sub>FSM</sub>	10 ms sine or 6 ms rect. pulse		275	
Non-repetitive avalanche energy per leg	E <sub>AS</sub>	$T_J = 25  ^{\circ}\text{C}$ , $I_{AS} = 0.50  \text{A}$ , $L = 60  \text{mH}$		7.50	mJ
Repetitive avalanche current per leg	I <sub>AR</sub>	Current decaying linearly to zero in 1 $\mu$ s Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical		0.50	Α

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## 43CTQ...S, 43CTQ...-1

## 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	0.81	
		40 A		0.98	V
		20 A	T <sub>J</sub> = 125 °C	0.67	
		40 A		0.81	
Maximum reverse leakage current per leg	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V Datad V	1	A
See fig. 2	IRM ('')	$V_R = Rated V_R$	11	mA	
Threshold voltage	V <sub>F(TO)</sub>	$T_{J} = T_{J}$ maximum		0.71	V
Forward slope resistance	r <sub>t</sub>			0.43	mΩ
Maximum junction capacitance per leg	C <sub>T</sub>	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		1480	pF
Typical series inductance per leg	L <sub>S</sub>	Measured lead to lead 5 mm from package body 8.0		nH	
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 175	°C
Maximum thermal resistance, junction to case per leg		D	DC operation	2.0	
Maximum thermal resistance, junction to case per package		$R_{thJC}$		1.0	°C/W
Typical thermal resistance, case to heatsink		R <sub>thCS</sub>	R <sub>thCS</sub> Mounting surface, smooth and greased (Only for TO-220)		
				2	g
Approximate weight				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm
Mounting torque -	maximum			12 (10)	(lbf · in)
Marking device		Case style D <sup>2</sup> PAK  Case style TO-262	43CTQ080S		
			43CTQ100S		
			43CTQ080-1		
				43CTQ100-1	



# Schottky Rectifier, 2 x 20 A

## Vishay High Power Products

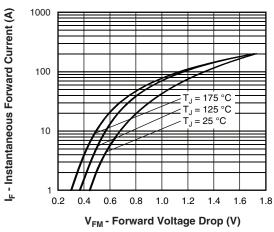


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

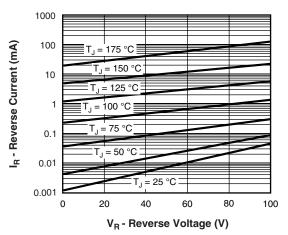


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

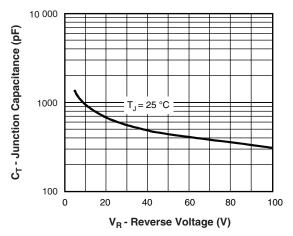


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

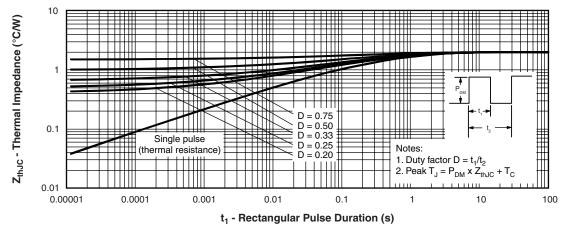
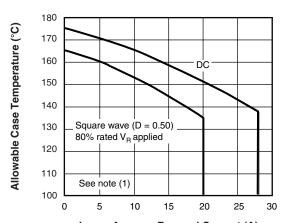


Fig. 4 - Maximum Thermal Impedance Z<sub>thJC</sub> Characteristics (Per Leg)

### Vishay High Power Products

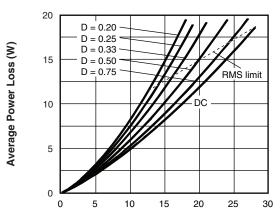
## Schottky Rectifier, 2 x 20 A





I<sub>F(AV)</sub> - Average Forward Current (A)

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



I<sub>F(AV)</sub> - Average Forward Current (A)

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

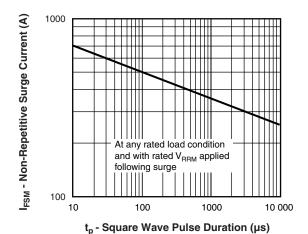


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

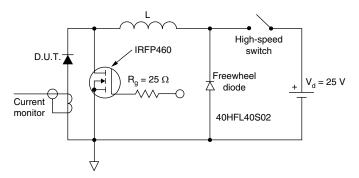


Fig. 8Unclamped Inductive Test Circuit

#### Note

 $^{(1)}$  Formula used: T<sub>C</sub> = T<sub>J</sub> - (Pd + Pd<sub>REV</sub>) x R<sub>thJC</sub>; Pd = Forward power loss = I<sub>F(AV)</sub> x V<sub>FM</sub> at (I<sub>F(AV)</sub>/D) (see fig. 6); Pd<sub>REV</sub> = Inverse power loss = V<sub>R1</sub> x I<sub>R</sub> (1 - D); I<sub>R</sub> at V<sub>R1</sub> = 10 V

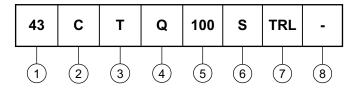


# Schottky Rectifier, 2 x 20 A

### Vishay High Power Products

#### **ORDERING INFORMATION TABLE**

**Device code** 



1 - Current rating (40 A)

2 - Circuit configuration:

C = Common cathode

**3** - T = TO-220

4 - Schottky "Q" series

5 - Voltage ratings — 080 = 80 V 100 = 100 V

6 - • S = D<sup>2</sup>PAK

• -1 = TO-262

7 - • None = Tube (50 pieces)

• TRL = Tape and reel (left oriented - for D<sup>2</sup>PAK only)

• TRR = Tape and reel (right oriented - for D<sup>2</sup>PAK only)

8 - • None = Standard production

• PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS				
Dimensions www.vishay.com/doc?95014				
Part marking information	www.vishay.com/doc?95008			
Packaging information	www.vishay.com/doc?95032			
SPICE model	www.vishay.com/doc?95065			



Vishay

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