## Vishay High Power Products

# Schottky Rectifier, 10 A



- Popular D-PAK outline
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for AEC Q101 level

### DESCRIPTION

The 10WQ045FN surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUES	UNITS	
I <sub>F(AV)</sub>	Rectangular waveform	10	A	
V <sub>RRM</sub>		45	V	
I <sub>FSM</sub>	t <sub>p</sub> = 5 μs sine	400	A	
V <sub>F</sub>	10 Apk, T <sub>J</sub> = 125 °C	0.53	V	
TJ	Range	- 40 to 175	°C	

VOLTAGE RATINGS				
PARAMETER	SYMBOL	10WQ045FNPbF	UNITS	
Maximum DC reverse voltage	V <sub>R</sub>	45	V	
Maximum working peak reverse voltage	V <sub>RWM</sub>	40	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> = 157 °C, rectangular waveform		10	А
Maximum peak one cycle non-repetitive surge current	1	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with	400	А
See fig. 7	I <sub>FSM</sub>	10 ms sine or 6 ms rect. pulse	rated V <sub>RRM</sub> applied	75	~
Non-repetitive avalanche energy	E <sub>AS</sub>	$T_J = 25 \text{ °C}, I_{AS} = 3 \text{ A}, L = 4.4 \text{ mH}$		20	mJ
Repetitive avalanche current	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>B</sub> typical		3.0	А

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

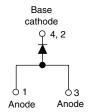




**PRODUCT SUMMARY** 

I<sub>F(AV)</sub>

 $V_{\mathsf{R}}$ 



10 A

45 V



## 10WQ045FNPbF

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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V <sub>FM</sub> <sup>(1)</sup>	10 A	T <sub>J</sub> = 25 °C	0.63	v
		20 A		0.80	
		10 A	- T <sub>J</sub> = 125 °C	0.53	
		20 A		0.71	
Maximum reverse leakage current See fig. 2	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V <sub>R</sub> = Rated V <sub>R</sub>	1	mA
		T <sub>J</sub> = 125 °C		15	
Threshold voltage	V <sub>F(TO)</sub>	- T <sub>J</sub> = T <sub>J</sub> maximum		0.255	V
Forward slope resistance	r <sub>t</sub>			22	mΩ
Typical junction capacitance	CT	$V_{\rm R}$ = 5 $V_{\rm DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		760	pF
Typical series inductance	L <sub>S</sub>	Measured lead to lead 5 mm from package body		5.0	nH

### 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 <sub>J</sub> <sup>(1)</sup> , T <sub>Stg</sub>		- 40 to 175	°C
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation See fig. 4	2.0	°C/W
Maximum thermal resistance, junction to ambient	R <sub>thJA</sub>		50	°C/w
Annrovimete weight			0.3	g
Approximate weight			0.01	0Z.
Marking device		Case style D-PAK (similar to TO-252AA)	10WQ045FN	

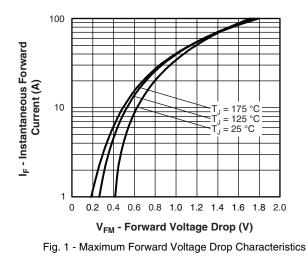
#### Note

<sup>(1)</sup>  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$  thermal runaway condition for a diode on its own heatsink



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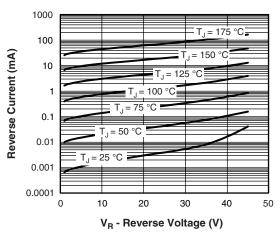


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

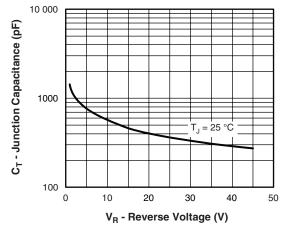


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

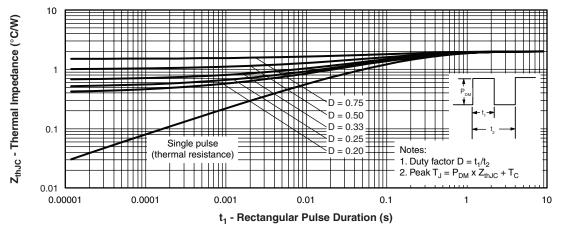


Fig. 4 - Maximum Thermal Impedance  $\mathsf{Z}_{\mathsf{thJC}}$  Characteristics

## 10WQ045FNPbF

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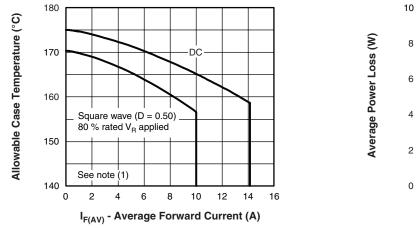
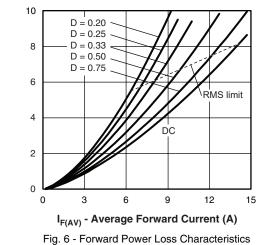


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



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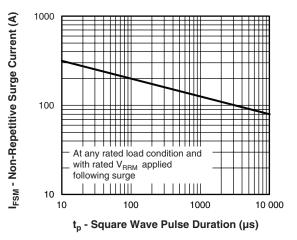


Fig. 7 - Maximum Non-Repetitive Surge Current

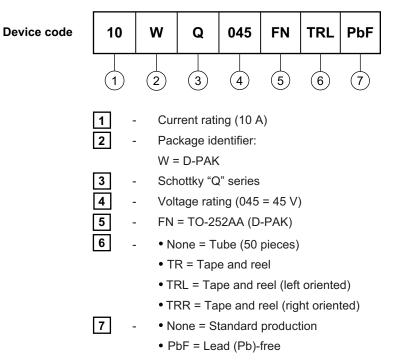
### Note



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### ORDERING INFORMATION TABLE



LINKS TO RELATED DOCUMENTS			
Dimensions	http://www.vishay.com/doc?95016		
Part marking information	http://www.vishay.com/doc?95059		
Packaging information	http://www.vishay.com/doc?95033		



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