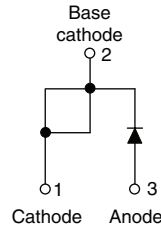


Schottky Rectifier, 18 A


TO-220AC

FEATURES

- 175 °C T_J operation
- 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

PRODUCT SUMMARY

$I_{F(AV)}$	18 A
V_R	35 to 50 V

DESCRIPTION

The 18TQ...PbF 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, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	18	A
V_{RRM}	Range	35 to 50	V
I_{FSM}	$t_p = 5 \mu s$ sine	1800	A
V_F	18 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.53	V
T_J	Range	- 55 to 175	$^\circ\text{C}$

VOLTAGE RATINGS

PARAMETER	SYMBOL	18TQ035PbF	18TQ040PbF	18TQ045PbF	18TQ050PbF	UNITS
Maximum DC reverse voltage	V_R	35	40	45	50	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 $T_C = 149 \text{ }^\circ\text{C}$, rectangular waveform	18	A
Maximum peak one cycle non-repetitive surge current See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	1800	
		10 ms sine or 6 ms rect. pulse	390	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 3.6 \text{ A}$, $L = 3.7 \text{ mH}$	24	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	3.6	A

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

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	18 A	$T_J = 25\text{ }^\circ\text{C}$	0.60	V
		36 A		0.72	
		18 A	$T_J = 125\text{ }^\circ\text{C}$	0.53	
		36 A		0.67	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	2.5	mA
		$T_J = 125\text{ }^\circ\text{C}$		25	
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		1400	pF
Typical series inductance	L_S	Measured lead to lead 5 mm from package body		8	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μ s

Note

(1) Pulse width < 300 μ 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	R_{thJC}	DC operation See fig. 4		1.50	$^\circ\text{C/W}$
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		0.50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style TO-220AC		18TQ050	

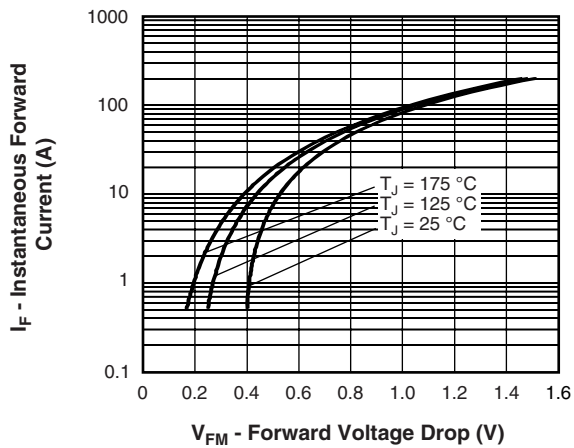


Fig. 1 - Maximum Forward Voltage Drop Characteristics

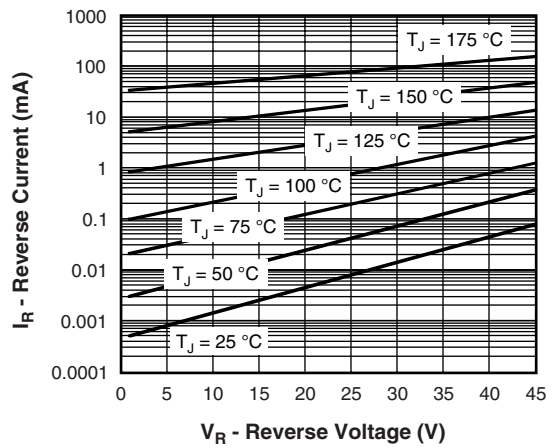


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

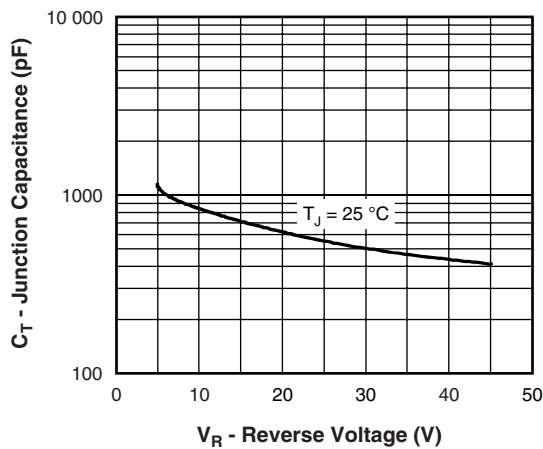


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

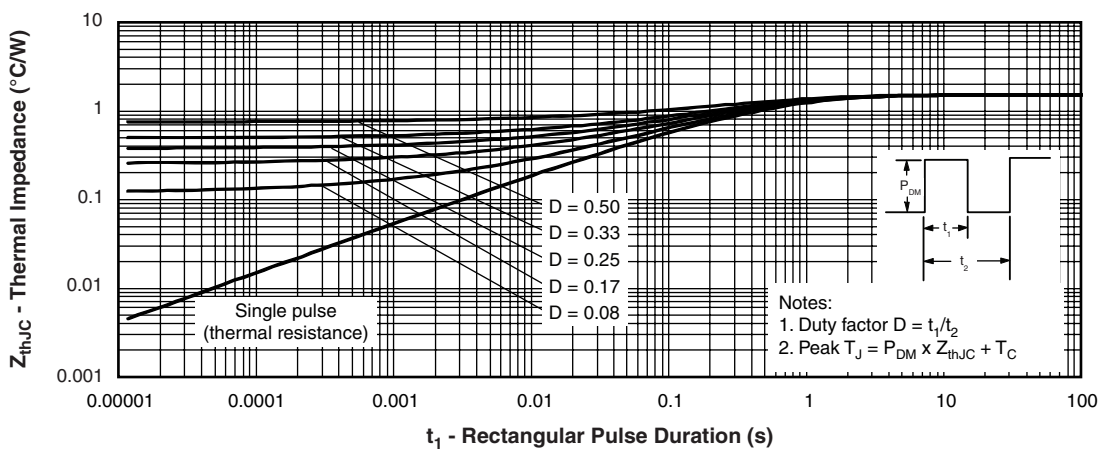


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

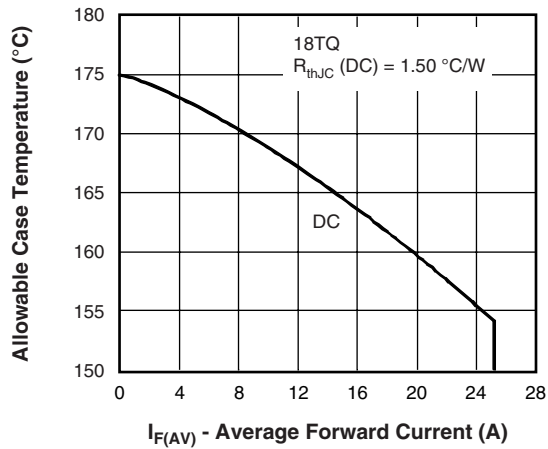


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

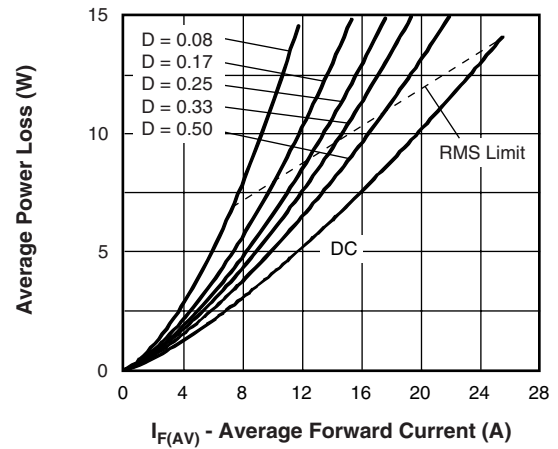


Fig. 6 - Forward Power Loss Characteristics

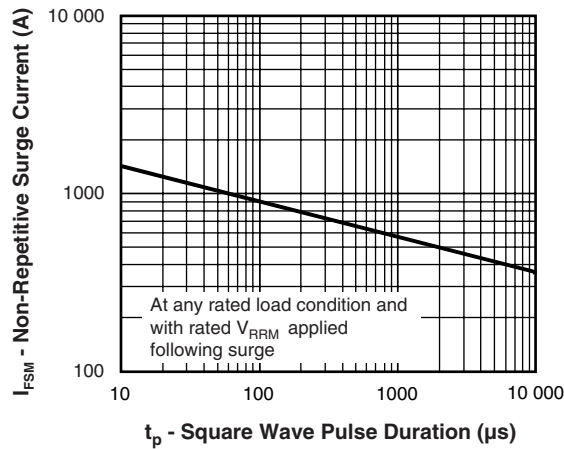


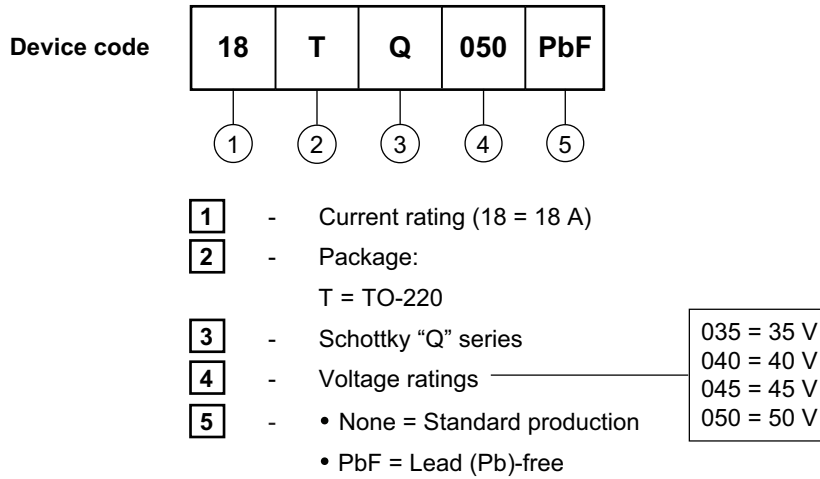
Fig. 7 - Maximum Non-Repetitive Surge Current



Fig. 8 - Unclamped Inductive Test Circuit



ORDERING INFORMATION TABLE



Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95221
Part marking information	http://www.vishay.com/doc?95224
SPICE model	http://www.vishay.com/doc?95280



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