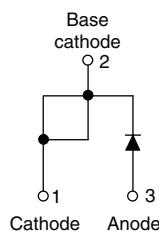


## Schottky Rectifier, 18 A



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
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


 RoHS\*  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	18 A
$V_R$	35 V 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, $T_J = 125^\circ C$	0.53	V
$T_J$	Range	- 55 to 175	°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 $T_C = 149^\circ C$ , rectangular waveform	18	A
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	1800	
Non-repetitive avalanche energy		10 ms sine or 6 ms rect. pulse	390	
Repetitive avalanche current	$I_{AR}$	Following any rated load condition and with rated $V_{RRM}$ applied		
		$T_J = 25^\circ C$ , $I_{AS} = 3.6 A$ , $L = 3.7 mH$	24	mJ
		Current decaying linearly to zero in 1 $\mu s$ 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**

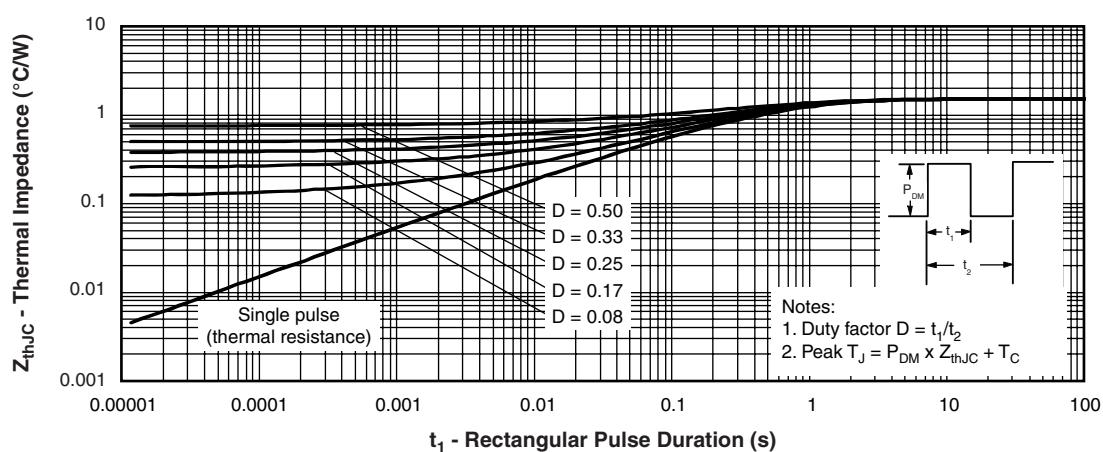
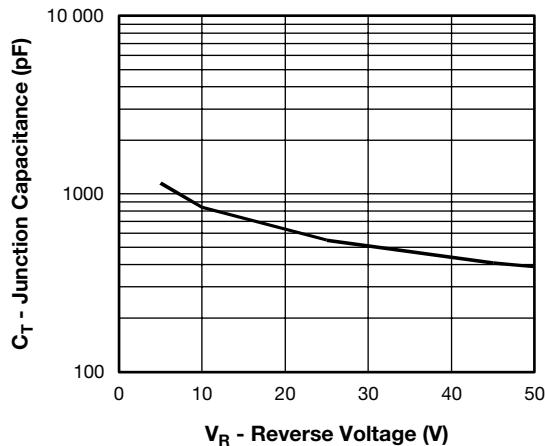
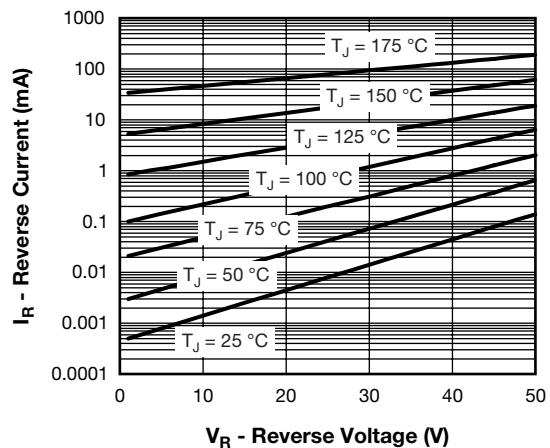
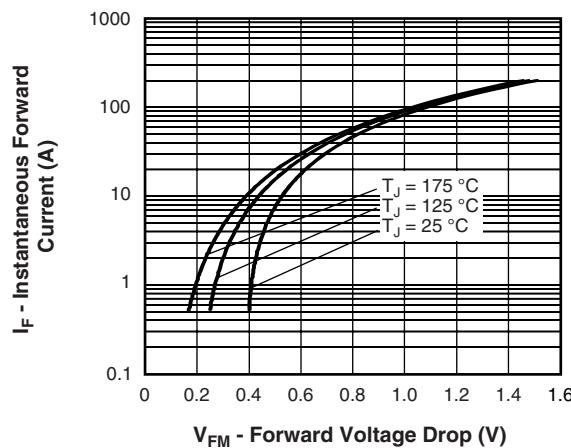
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	18 A	$T_J = 25 \text{ }^\circ\text{C}$	0.60	V	
		36 A		0.72		
		18 A	$T_J = 125 \text{ }^\circ\text{C}$	0.53		
		36 A		0.67		
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	2.5	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		25		
Maximum junction capacitance	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		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/μs	

**Note**

(1) Pulse width &lt; 300 μs, duty cycle &lt; 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	$R_{thJC}$	DC operation See fig. 4	1.50	°C/W	
Typical thermal resistance, case to heatsink	$R_{thCS}$		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	18TQ035		
			18TQ040		
			18TQ045		
			18TQ050		



# 18TQ0..PbF Series

Vishay High Power Products

Schottky Rectifier, 18 A

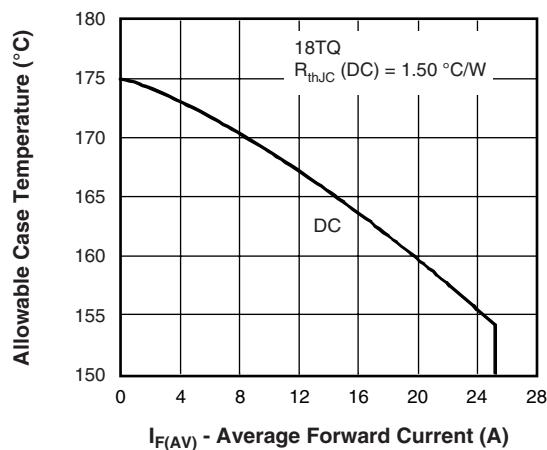


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

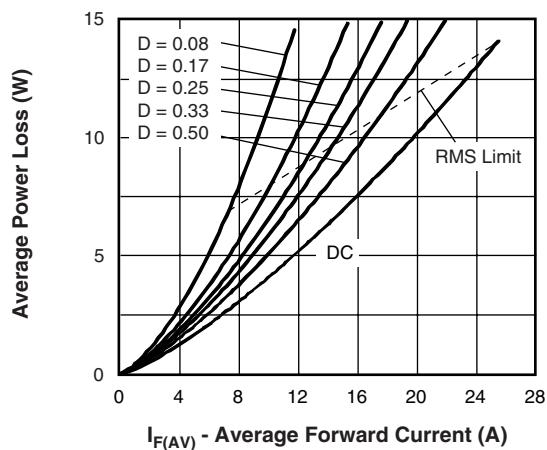


Fig. 6 - Forward Power Loss Characteristics

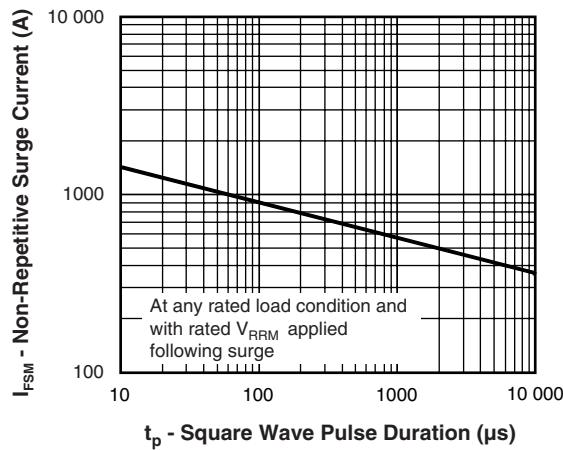


Fig. 7 - Maximum Non-Repetitive Surge Current

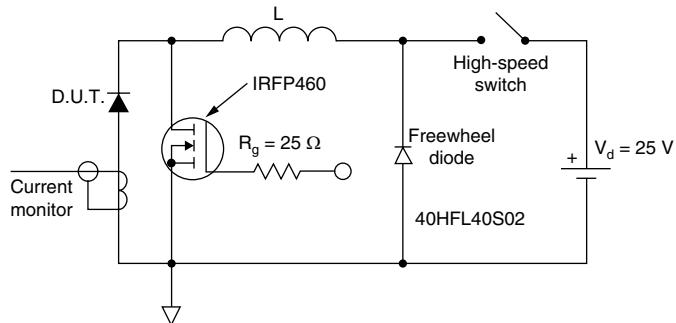


Fig. 8 - Unclamped Inductive Test Circuit

**ORDERING INFORMATION TABLE**

Device code	18	T	Q	050	PbF
	1	2	3	4	5

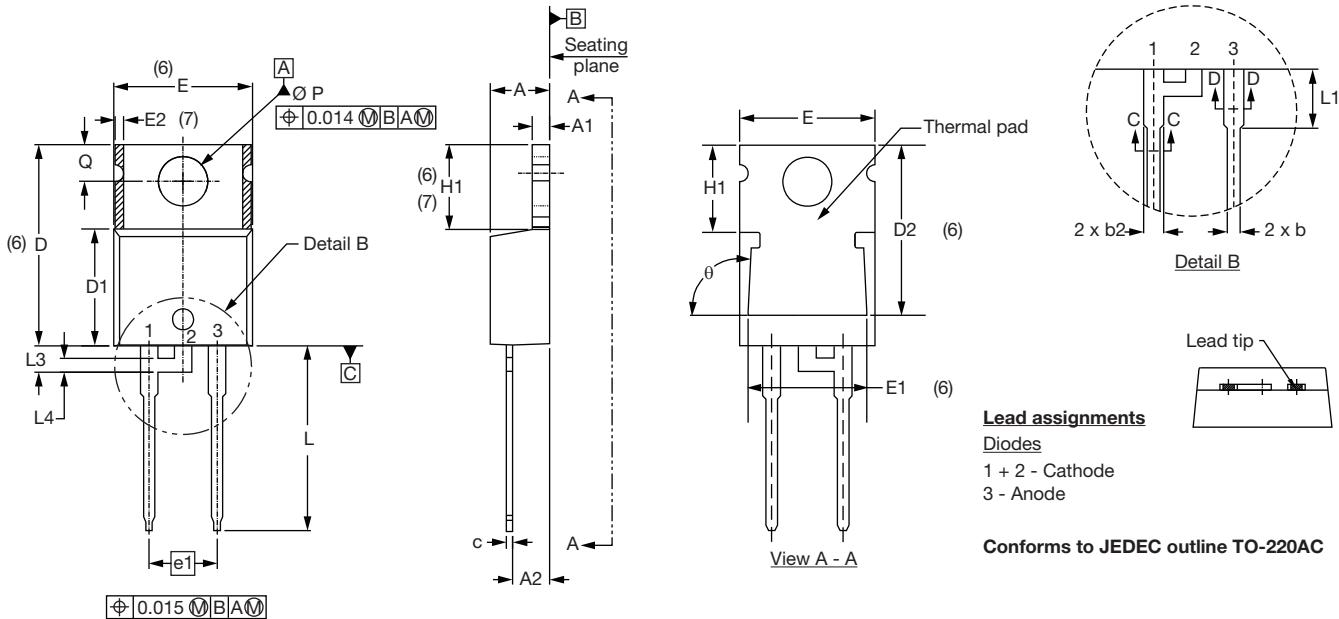
- |          |  |  |
|----------|--|--|
| <b>1</b> | - Current rating (18 = 18 A)   |  |
| <b>2</b> | - Package:<br>T = TO-220   |  |
| <b>3</b> | - Schottky "Q" series  | 035 = 35 V<br>040 = 40 V<br>045 = 45 V<br>050 = 50 V |
| <b>4</b> | - Voltage ratings  |  |
| <b>5</b> | <ul style="list-style-type: none"> <li>• None = Standard production</li> <li>• PbF = Lead (Pb)-free</li> </ul> |  |

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95221">www.vishay.com/doc?95221</a>
Part marking information	<a href="http://www.vishay.com/doc?95224">www.vishay.com/doc?95224</a>
SPICE model	<a href="http://www.vishay.com/doc?95280">www.vishay.com/doc?95280</a>

# TO-220AC

**DIMENSIONS** in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.25	4.65	0.167	0.183	
A1	1.14	1.40	0.045	0.055	
A2	2.56	2.92	0.101	0.115	
b	0.69	1.01	0.027	0.040	
b1	0.38	0.97	0.015	0.038	4
b2	1.20	1.73	0.047	0.068	
b3	1.14	1.73	0.045	0.068	4
c	0.36	0.61	0.014	0.024	
c1	0.36	0.56	0.014	0.022	4
D	14.85	15.25	0.585	0.600	3
D1	8.38	9.02	0.330	0.355	
D2	11.68	12.88	0.460	0.507	6
E	10.11	10.51	0.398	0.414	3, 6

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
E1	6.86	8.89	0.270	0.350	6
E2	-	0.76	-	0.030	7
e	2.41	2.67	0.095	0.105	
e1	4.88	5.28	0.192	0.208	
H1	6.09	6.48	0.240	0.255	6, 7
L	13.52	14.02	0.532	0.552	
L1	3.32	3.82	0.131	0.150	2
L3	1.78	2.13	0.070	0.084	
L4	0.76	1.27	0.030	0.050	2
Ø P	3.54	3.73	0.139	0.147	
Q	2.60	3.00	0.102	0.118	
θ	90° to 93°		90° to 93°		

## Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
  - (2) Lead dimension and finish uncontrolled in L1
  - (3) Dimension D, D1 and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
  - (4) Dimension b1, b3 and c1 apply to base metal only
  - (5) Controlling dimension: inches
  - (6) Thermal pad contour optional within dimensions E, H1, D2 and E1
  - (7) Dimension E2 x H1 define a zone where stamping and singulation irregularities are allowed
  - (8) Outline conforms to JEDEC TO-220, D2 (minimum) where dimensions are derived from the actual package outline

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