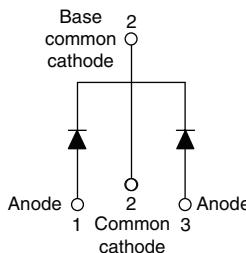


## Schottky Rectifier, 2 x 30 A



TO-220AB



### FEATURES

- 150 °C  $T_J$  operation
- Center tap TO-220 package
- 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

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. 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.

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 30 A
$V_R$	45 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	60	A
$V_{RRM}$		45	V
$I_{FRM}$	$T_C = 113$ °C (per leg)	60	A
$I_{FSM}$	$t_p = 5$ $\mu$ s sine	1500	
$V_F$	30 Apk, $T_J = 125$ °C	0.53	V
$T_J$	Range	- 65 to 150	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	60CTQ045	UNITS
Maximum DC reverse voltage	$V_R$	45	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg	$I_{F(AV)}$	50 % duty cycle at $T_C = 113$ °C, rectangular waveform	30	A
per device			60	
Peak repetitive forward current per leg	$I_{FRM}$	Rated $V_R$ , square wave, 20 kHz, $T_C = 113$ °C	60	
Maximum peak one cycle non-repetitive surge current per leg	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	1500	
		10 ms sine or 6 ms rect. pulse	300	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 3$ A, $L = 4.40$ mH	20	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu$ s Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	3	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS	
Maximum forward voltage drop	$V_{FM}^{(1)}$	30 A	$T_J = 25 \text{ }^\circ\text{C}$	0.51	0.56	V	
		60 A		0.66	0.72		
		30 A	$T_J = 125 \text{ }^\circ\text{C}$	0.48	0.53		
		60 A		0.68	0.75		
Maximum instantaneous reverse current	$I_{RM}$	$T_J = 25 \text{ }^\circ\text{C}$	Rated DC voltage	0.33	2	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		145	250		
Maximum junction capacitance	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		2000		pF	
Typical series inductance	$L_S$	Measured from top of terminal to mounting plane		8.0		nH	
Maximum voltage rate of change	$dV/dt$	Rated $V_R$		10 000		V/ $\mu$ s	

**Note**(1) Pulse width < 300  $\mu$ s, duty cycle < 2 %
 **THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	$T_J$		- 65 to 150	$^\circ\text{C}$
Maximum storage temperature range	$T_{Stg}$		- 65 to 175	
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation	1.2	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$		0.50	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum	Non-lubricated threads	6 (5)	kgf $\cdot$ cm (lbf $\cdot$ in)
	maximum		12 (10)	
Marking device		Case style TO-220AB	60CTQ045	

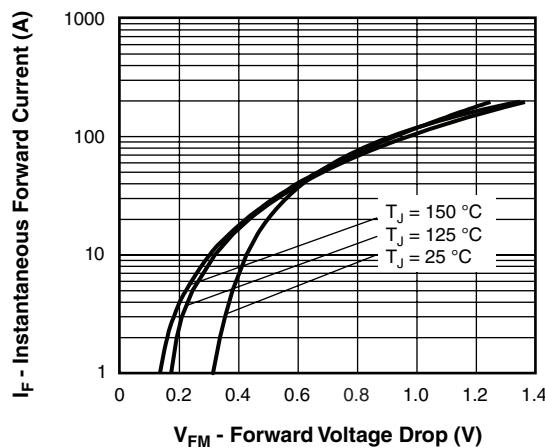


Fig. 1 - Maximum Forward Voltage Drop Characteristics

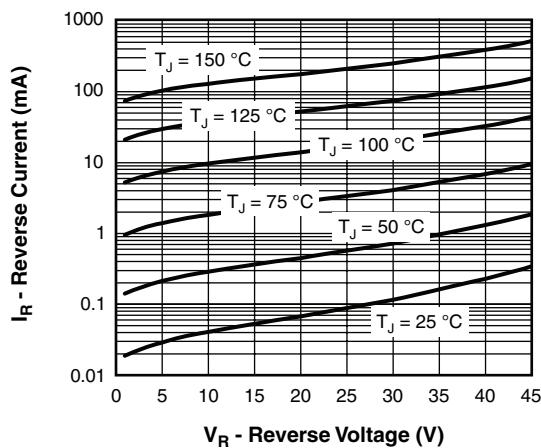


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

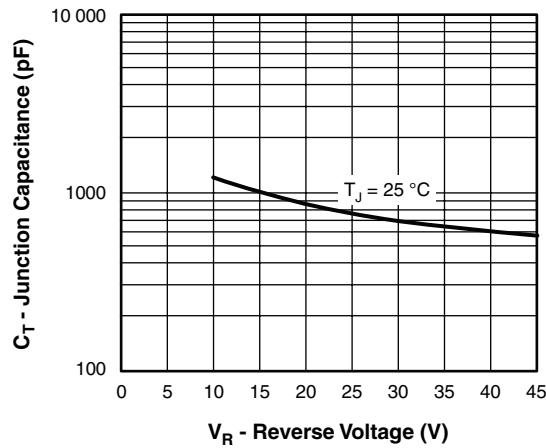


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

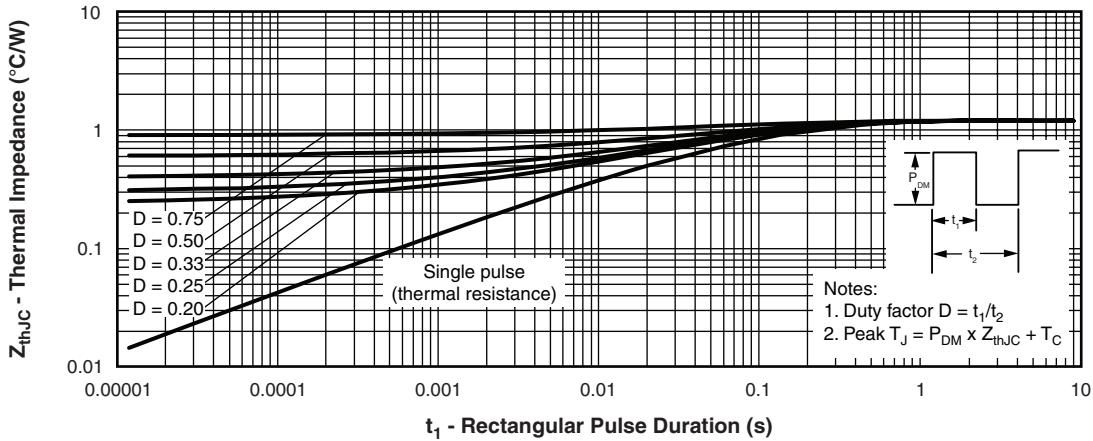


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

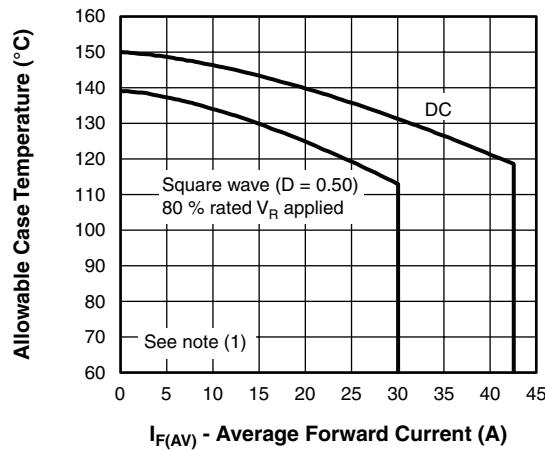


Fig. 5 - Maximum Allowable Case Temperature vs.  
Average Forward Current

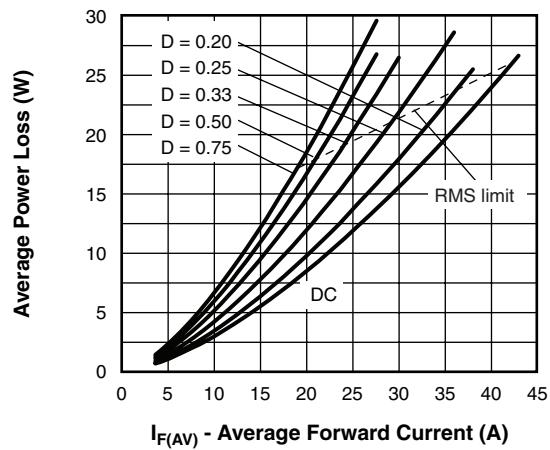


Fig. 6 - Forward Power Loss Characteristics

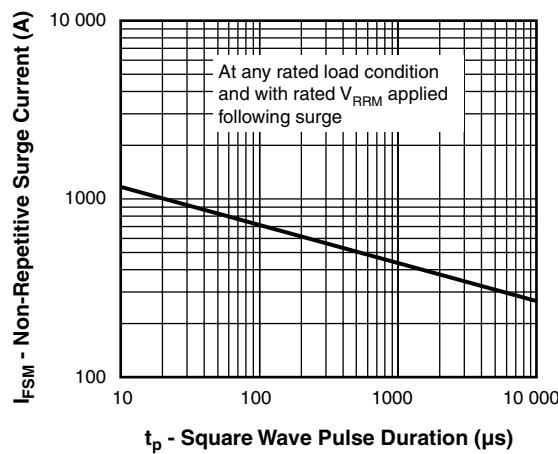


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

#### Note

(1) Formula used:  $T_C = T_J - (P_d + P_{d,REV}) \times R_{thJC}$ ;  
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  
 $P_{d,REV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$

**ORDERING INFORMATION TABLE**

Device code	60	C	T	Q	045	-
	1	2	3	4	5	6

- 1** - Current rating (60 = 60 A)
- 2** - Circuit configuration:  
C = Common cathode
- 3** - Package:  
T = TO-220
- 4** - Schottky "Q" series
- 5** - Voltage rating (045 = 45 V)
- 6** - • None = Standard production  
• PbF = Lead (Pb)-free

Tube standard pack quantity: 50 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95222">http://www.vishay.com/doc?95222</a>
Part marking information	<a href="http://www.vishay.com/doc?95225">http://www.vishay.com/doc?95225</a>

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