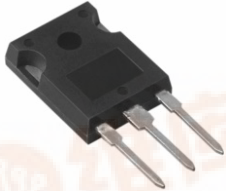




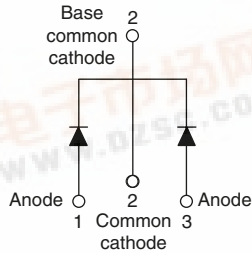
**60CPT045**

Vishay High Power Products

## High Performance Schottky Generation 5.0, 2 x 30 A



TO-247AC



### FEATURES

- 175 °C high performance Schottky diode
- Very low forward voltage drop
- Extremely low reverse leakage
- Optimized  $V_F$  vs.  $I_R$  trade off for high efficiency
- Increased ruggedness for reverse avalanche capability
- RBSOA available
- Negligible switching losses
- Submicron trench technology
- Full lead (Pb)-free and RoHS compliant devices
- Designed and qualified for industrial level



**RoHS COMPLIANT**

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 30 A
$V_R$	45 V
$V_F$ at 30 A at 125 °C	0.50 V

### APPLICATIONS

- High efficiency SMPS
- Automotive
- High frequency switching
- Output rectification
- Reverse battery protection
- Freewheeling
- Dc-to-dc systems
- Increased power density systems

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$		45	V
$V_F$	30 Apk, $T_J = 125$ °C (typical, per leg)	0.46	
$T_J$	Range	- 55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	60CPT045	UNITS
Maximum DC reverse voltage	$V_R$	$T_J = 25$ °C	45	V

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 159$ °C, rectangular waveform	30	A
			60	
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	2500	A
		10 ms sine or 6 ms rect. pulse	450	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 8$ A, $L = 4.4$ mH	140	mJ
Repetitive avalanche current	$I_{AR}$	Limited by frequency of operation and time pulse duration so that $T_J < T_{J \text{ max}}$ . $I_{AS}$ at $T_J \text{ max}$ . as a function of time pulse See fig. 8	$I_{AS}$ at $T_J \text{ max}$ .	A



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ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Forward voltage drop per leg	$V_{FM}^{(1)}$	30 A	$T_J = 25\text{ }^\circ\text{C}$	-	0.58	V
		60 A		-	0.67	
		30 A	$T_J = 125\text{ }^\circ\text{C}$	-	0.50	
		60 A		-	0.65	
Reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	-	250	$\mu\text{A}$
		$T_J = 125\text{ }^\circ\text{C}$		-	20	mA
Junction capacitance per leg	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		3500	-	pF
Series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body		7.5	-	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		-	10 000	V/ $\mu\text{s}$

**Note**

(1) Pulse width < 300  $\mu\text{s}$ , 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 per leg	$R_{thJC}$	DC operation	0.8	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per device			0.4	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased	0.25	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC (TO-3P)	60CPT045	



High Performance Schottky Generation 5.0,  
2 x 30 A

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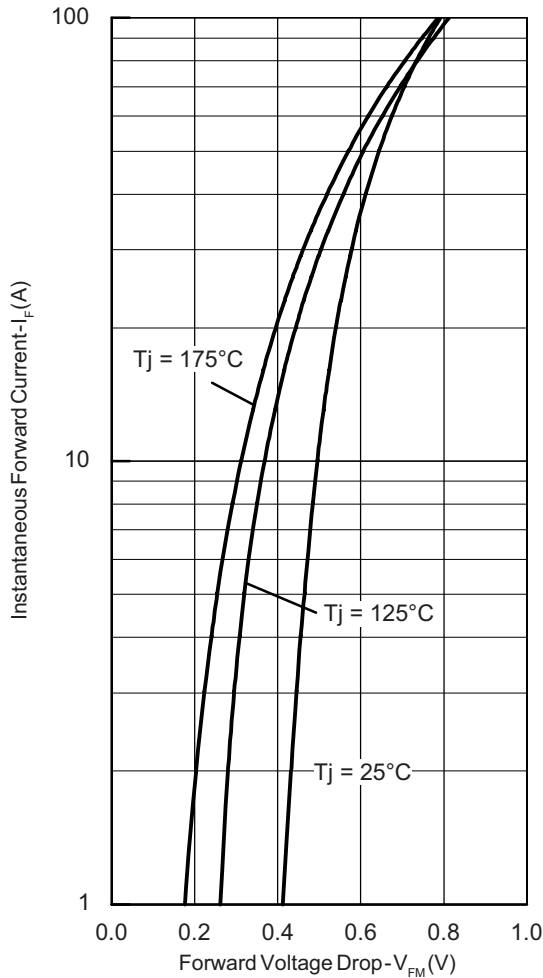


Fig. 1 - Maximum Forward Voltage Drop Characteristics

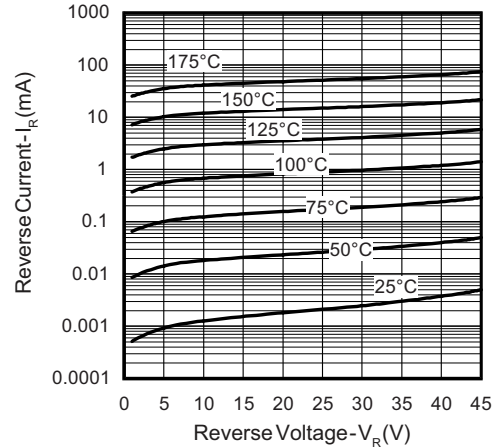


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

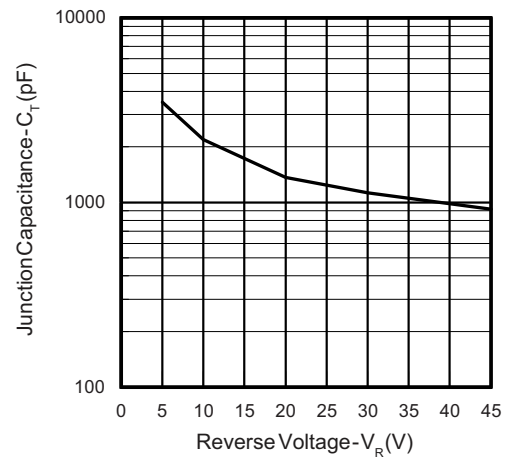


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

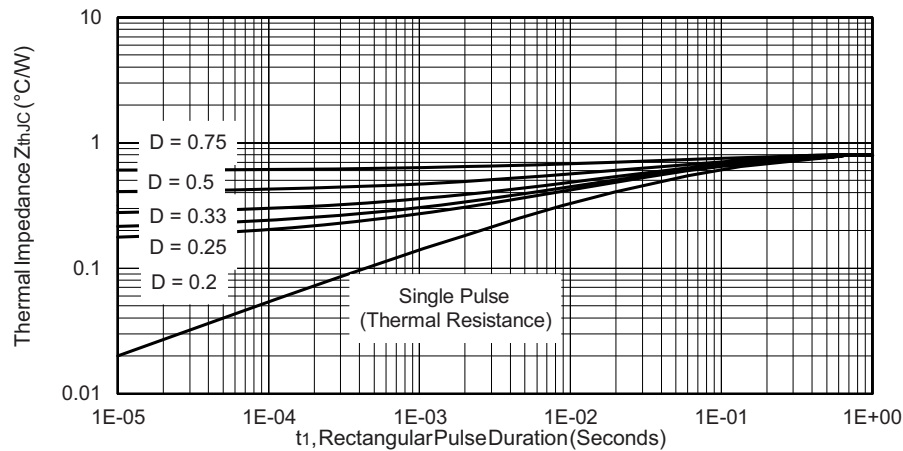


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

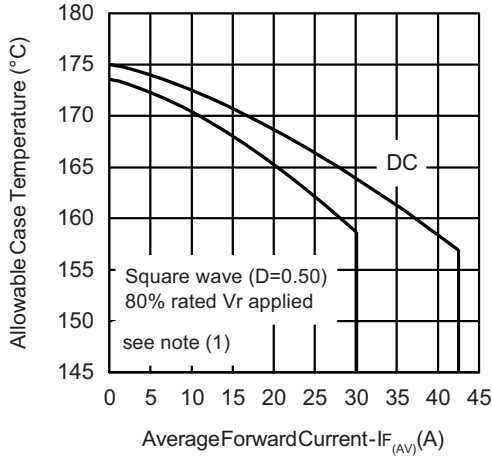


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

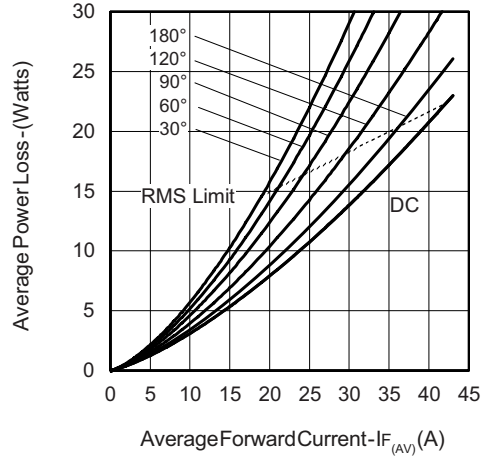


Fig. 6 - Forward Power Loss Characteristics

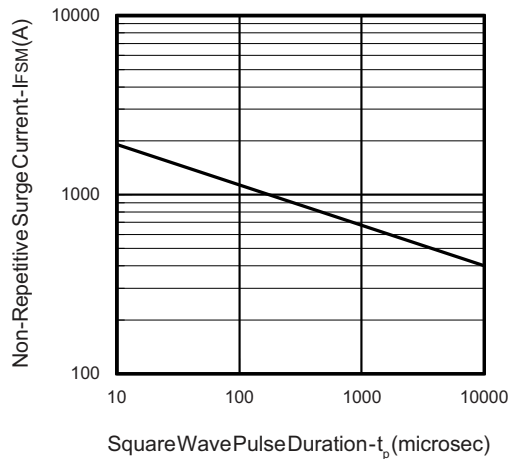


Fig. 7 - Maximum Non-Repetitive Surge Current

**Note**

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



High Performance Schottky Generation 5.0,  
2 x 30 A Vishay High Power Products

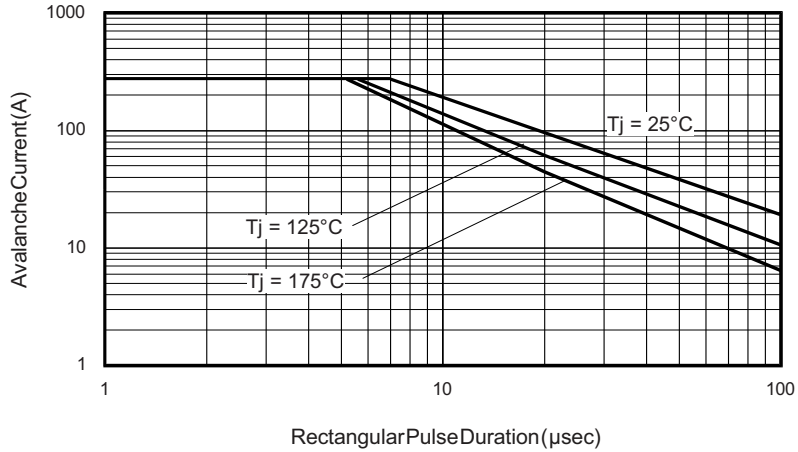


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

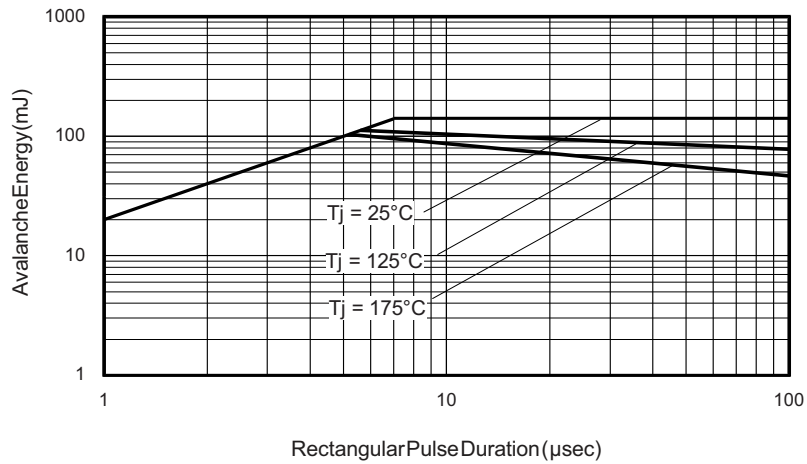


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

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## ORDERING INFORMATION TABLE

Device code	<b>60</b>	<b>C</b>	<b>P</b>	<b>T</b>	<b>045</b>
	①	②	③	④	⑤
<b>1</b>	-	Current rating (60 A)			
<b>2</b>	-	Circuit configuration: C = Common cathode			
<b>3</b>	-	Package: P = TO-247			
<b>4</b>	-	T = Trench			
<b>5</b>	-	Voltage code (45 V)			

Tube standard pack quantity: 25 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95223">http://www.vishay.com/doc?95223</a>
Part marking information	<a href="http://www.vishay.com/doc?95226">http://www.vishay.com/doc?95226</a>



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