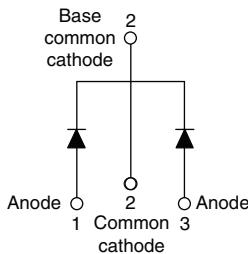


## High Performance Schottky Generation 5.0, 2 x 30 A


**TO-247AC**

**RoHS**  
COMPLIANT

**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

**APPLICATIONS**

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

**PRODUCT SUMMARY**

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

**MAJOR RATINGS AND CHARACTERISTICS**

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$	30 Apk, $T_J = 125$ °C (typical, per leg)	45	V
$V_F$		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 per leg	$I_{F(AV)}$	50 % duty cycle at $T_C = 159$ °C, rectangular waveform	30	A
per device			60	
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 $\mu$ s sine or 3 $\mu$ s rect. pulse	2500	
		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 $T_J < T_J$ max. $I_{AS}$ at $T_J$ max. as a function of time pulse See fig. 8	$I_{AS}$ at $T_J$ max.	A

**60CPT045**

Vishay High Power Products

High Performance  
Schottky Generation 5.0,  
2 x 30 A**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	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (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	$^\circ\text{C}/\text{W}$
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)	$\text{kgf} \cdot \text{cm}$ (lbf · in)
	maximum			12 (10)	
Marking device		Case style TO-247AC (TO-3P)		60CPT045	

High Performance  
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2 x 30 A

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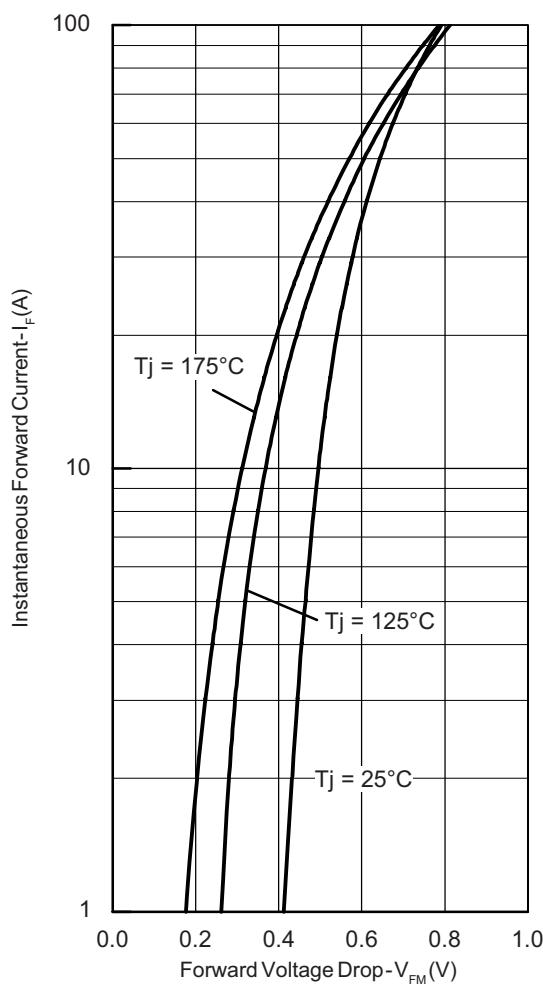


Fig. 1 - Maximum Forward Voltage Drop Characteristics

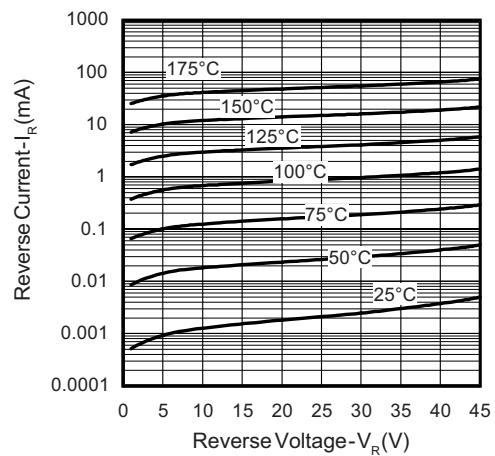


Fig. 2 - Typical Values of Reverse Current vs.  
Reverse Voltage

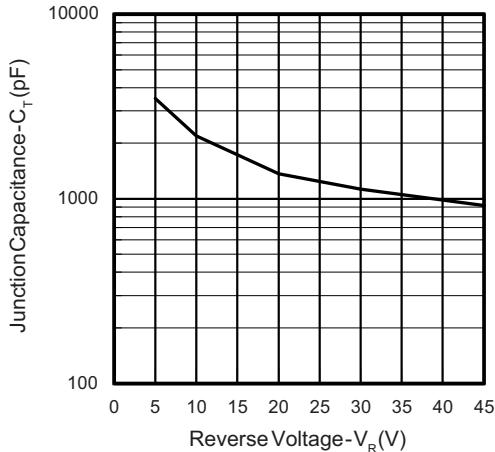


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

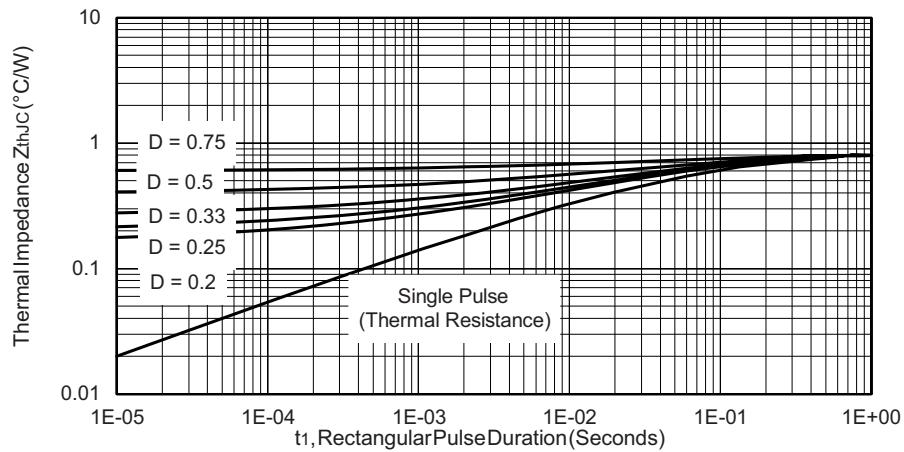


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

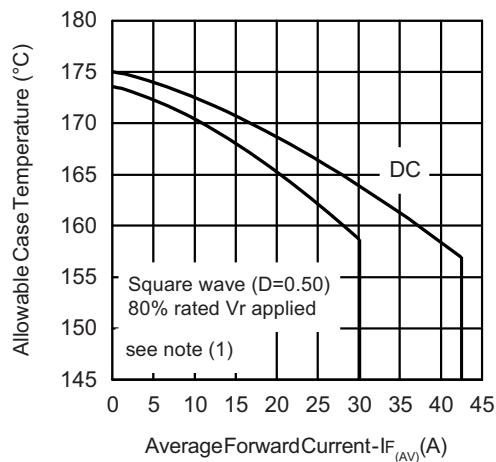


Fig. 5 - Maximum Allowable Case Temperature vs.  
Average Forward Current

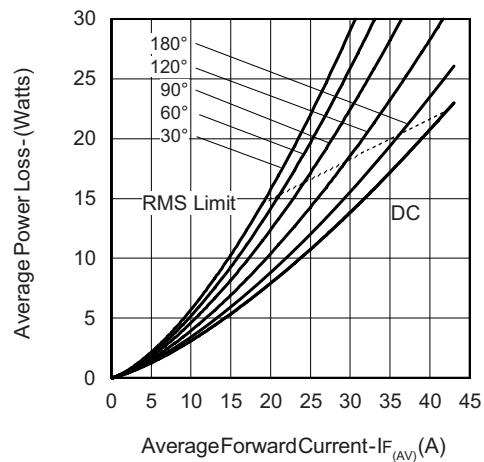


Fig. 6 - Forward Power Loss Characteristics

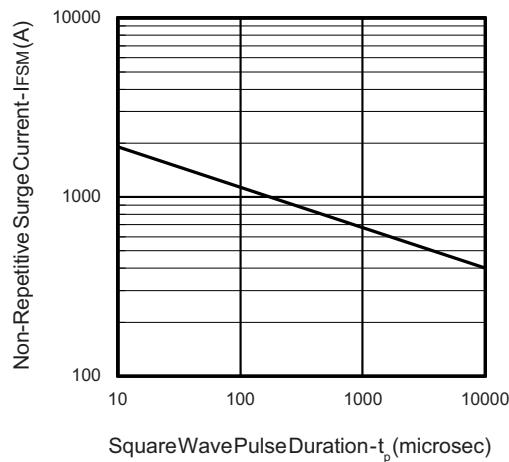


Fig. 7 - Maximum Non-Repetitive Surge Current

#### Note

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

High Performance Schottky Generation 5.0,  
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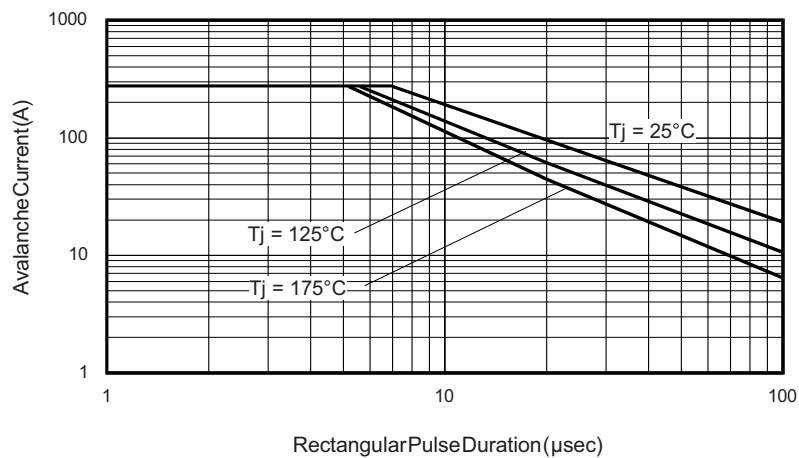


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

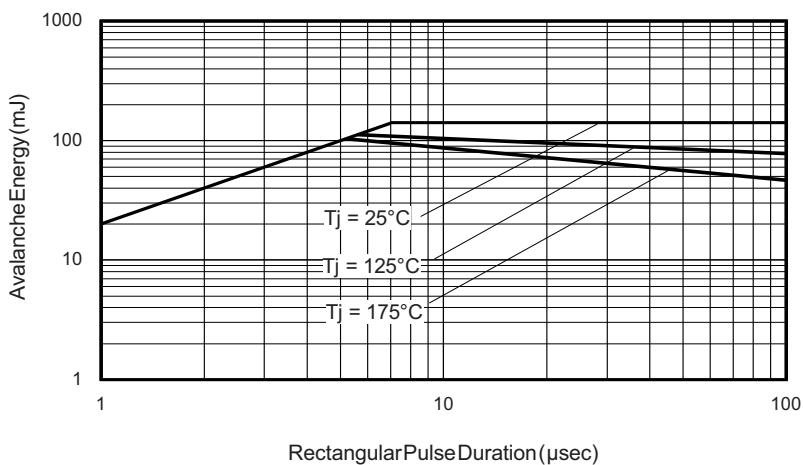


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

**ORDERING INFORMATION TABLE**

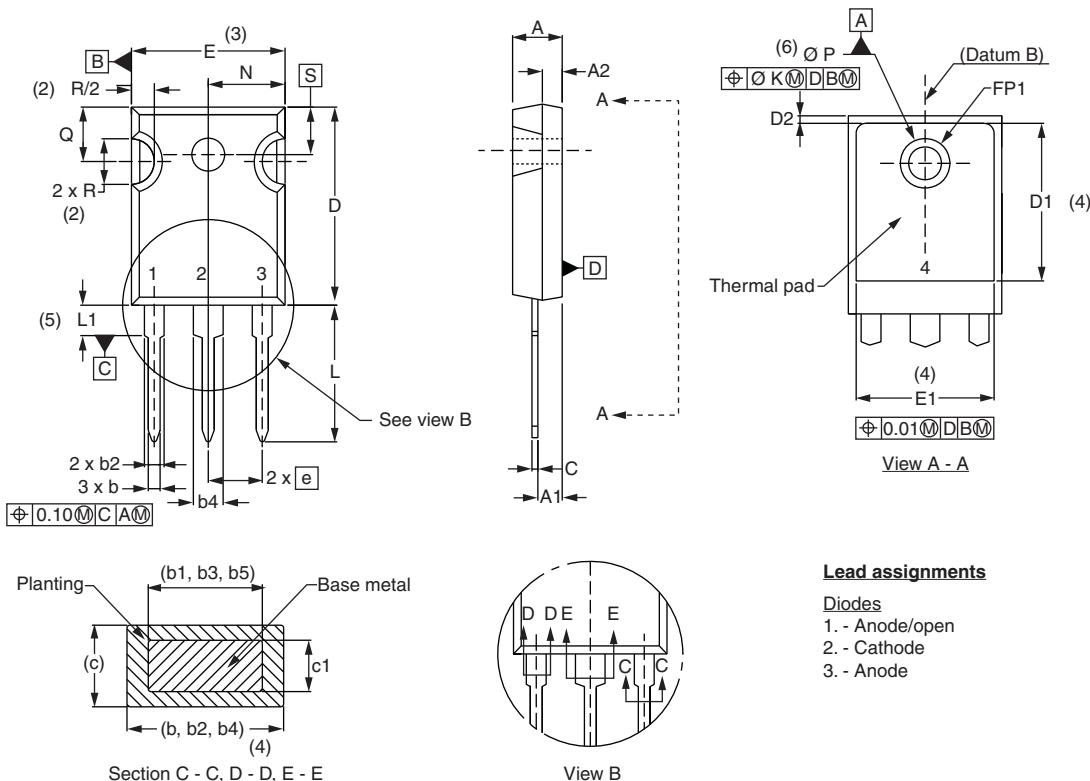
Device code	60	C	P	T	045
	1	2	3	4	5

- 1** - Current rating (60 A)
- 2** - Circuit configuration:  
C = Common cathode
- 3** - Package:  
P = TO-247
- 4** - T = Trench
- 5** - 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>

**DIMENSIONS** in millimeters and inches



Symbol	Millimeters		Inches		Notes		Symbol	Millimeters		Inches		Notes
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.	
A	4.65	5.31	0.183	0.209			D2	0.51	1.30	0.020	0.051	
A1	2.21	2.59	0.087	0.102			E	15.29	15.87	0.602	0.625	3
A2	1.50	2.49	0.059	0.098			E1	13.72	-	0.540	-	
b	0.99	1.40	0.039	0.055			e	5.46 BSC		0.215 BSC		
b1	0.99	1.35	0.039	0.053			FK	2.54		0.010		
b2	1.65	2.39	0.065	0.094			L	14.20	16.10	0.559	0.634	
b3	1.65	2.37	0.065	0.094			L1	3.71	4.29	0.146	0.169	
b4	2.59	3.43	0.102	0.135			N	7.62 BSC		0.3		
b5	2.59	3.38	0.102	0.133			ΦP	3.56	3.66	0.14	0.144	
c	0.38	0.86	0.015	0.034			ΦP1	-	6.98	-	0.275	
c1	0.38	0.76	0.015	0.030			Q	5.31	5.69	0.209	0.224	
D	19.71	20.70	0.776	0.815	3		R	4.52	5.49	1.78	0.216	
D1	13.08	-	0.515	-	4		S	5.51 BSC		0.217 BSC		

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## Notes

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
  - (2) Contour of slot optional
  - (3) Dimension D 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) Thermal pad contour optional with dimensions D1 and E1
  - (5) Lead finish uncontrolled in L1
  - (6) Ø P to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
  - (7) Outline conforms to JEDEC outline TO-247 with exception of dimension c

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