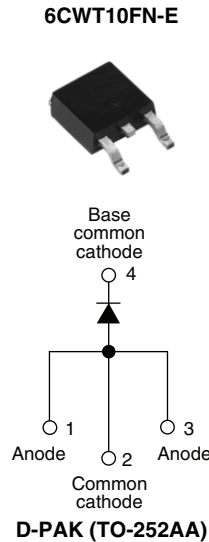
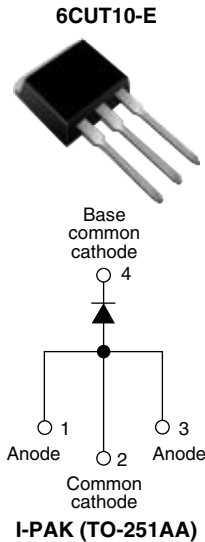


## High Performance Schottky Generation 5.0, 2 x 3 A



### 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
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



**RoHS**  
COMPLIANT

### APPLICATIONS

- Specific for PV cells bypass diode
- High efficiency SMPS
- Automotive
- High frequency switching
- Output rectification
- Reverse battery protection
- Freewheeling
- DC/DC systems
- Increased power density systems

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 3 A
$V_R$	100 V
Maximum $V_F$ at 3 A at 125 °C	0.63 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$V_{RRM}$		100	V
$V_F$	3 A <sub>pk</sub> , T <sub>J</sub> = 125 °C (typical, per leg)	0.6	
T <sub>J</sub>	Range	- 55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	6CUT10-E 6CWT10FN-E	UNITS
Maximum DC reverse voltage	$V_R$	T <sub>J</sub> = 25 °C	100	V

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current <small>per leg</small> <small>per device</small>	$I_{F(AV)}$	50 % duty cycle at T <sub>C</sub> = 166 °C, rectangular waveform	3	A
			6	
Maximum peak one cycle non-repetitive surge current per leg	$I_{FSM}$	5 μs sine or 3 μs rect. pulse	440	
		10 ms sine or 6 ms rect. pulse	70	
Non-repetitive avalanche energy per leg	$E_{AS}$	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 4 A, L = 1.5 mH	12	mJ
Repetitive avalanche current per leg	$I_{AR}$	Limited by frequency of operation and time pulse duration so that T <sub>J</sub> < T <sub>J</sub> max. I <sub>AS</sub> at T <sub>J</sub> max. as a function of time pulse. See fig. 8	I <sub>AS</sub> at T <sub>J</sub> max.	A

# 6CUT10-E, 6CWT10FN-E



Vishay High Power Products High Performance Schottky  
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ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Forward voltage drop per leg	$V_{FM}^{(1)}$	3 A	$T_J = 25\text{ }^\circ\text{C}$	0.720	0.79	V
		6 A		0.825	0.91	
		3 A	$T_J = 125\text{ }^\circ\text{C}$	0.60	0.63	
		6 A		0.69	0.74	
Reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.3	30	$\mu\text{A}$
		$T_J = 125\text{ }^\circ\text{C}$		0.3	1	mA
Junction capacitance per leg	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		114	-	pF
Series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body		8.0	-	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	4.7	$^\circ\text{C/W}$
Maximum thermal resistance, junction to case per device			2.35	
Typical thermal resistance, case to heatsink	$R_{thCS}$		0.3	
Approximate weight			0.3	g
			0.01	oz.
Marking device		Case style I-PAK	6CUT10	
		Case style D-PAK	6CWT10FN	

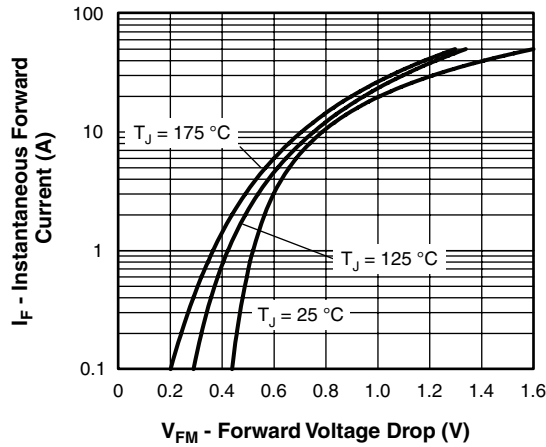


Fig. 1 - Maximum Forward Voltage Drop Characteristics

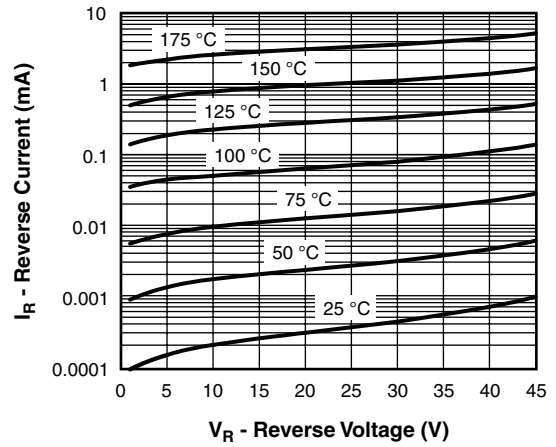


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

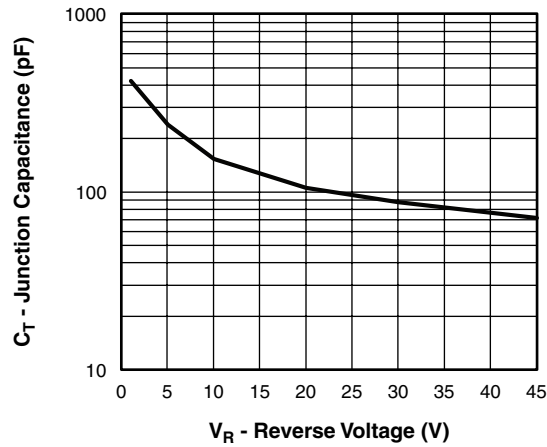


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

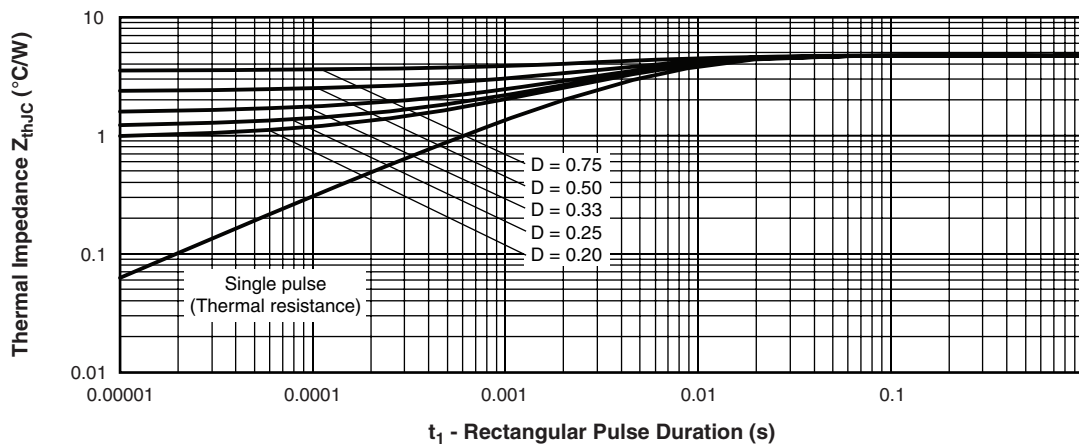


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

# 6CUT10-E, 6CWT10FN-E



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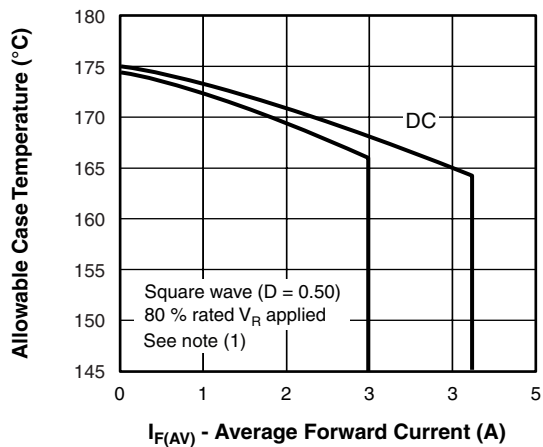


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

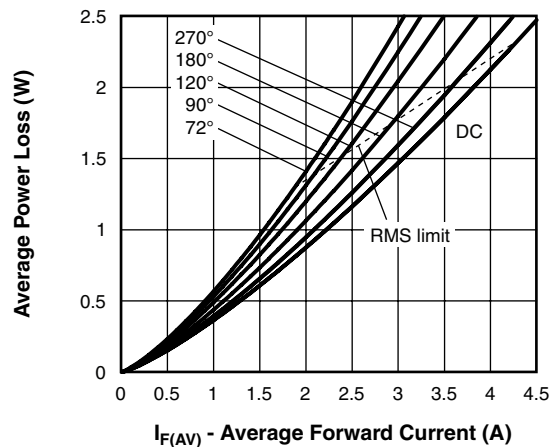


Fig. 6 - Forward Power Loss Characteristics

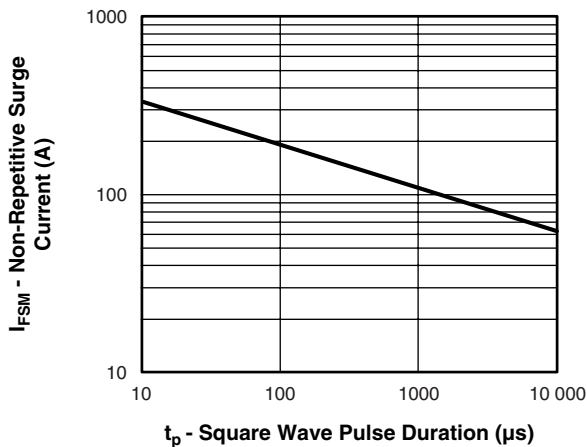


Fig. 7 - Maximum Non-Repetitive Surge Current

## Note

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



# 6CUT10-E, 6CWT10FN-E

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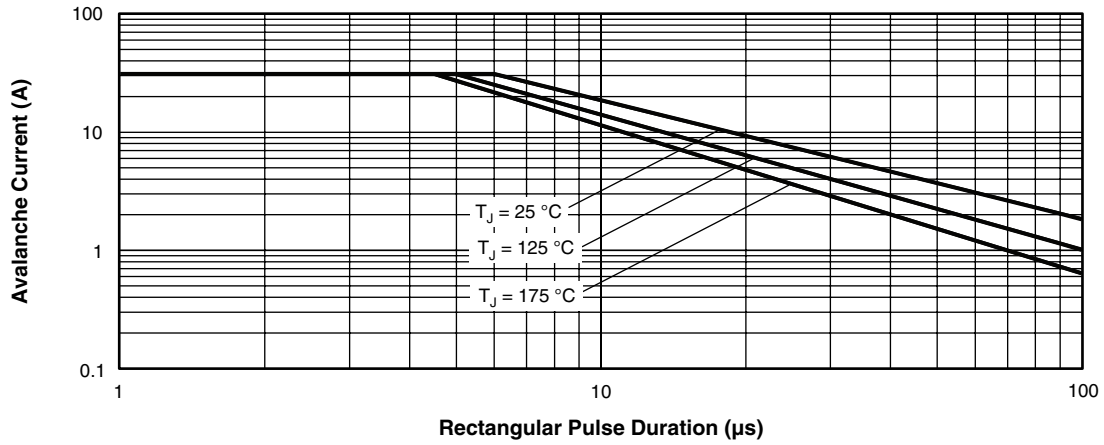


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

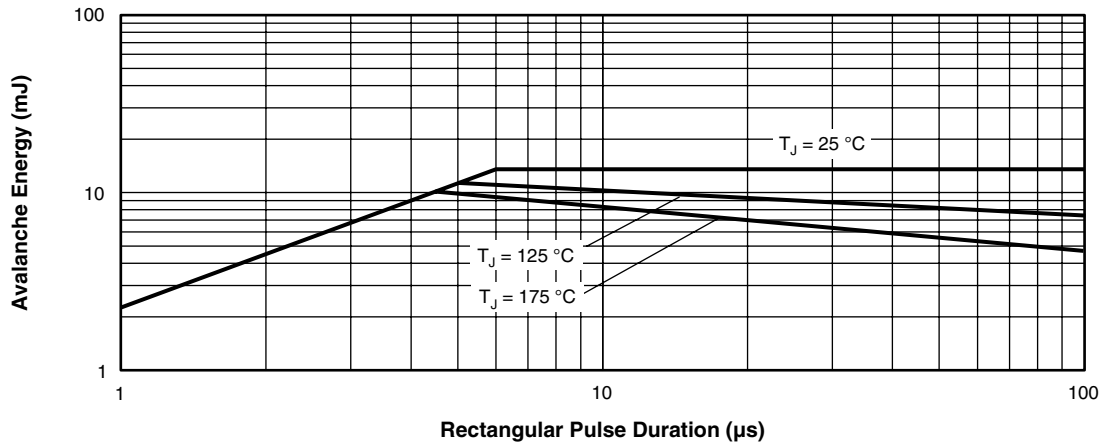


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

# 6CUT10-E, 6CWT10FN-E



Vishay High Power Products High Performance Schottky  
Generation 5.0, 2 x 3 A

## ORDERING INFORMATION TABLE

Device code	<b>6</b>	<b>C</b>	<b>U</b>	<b>T</b>	<b>10</b>	<b>FN</b>	<b>TRL</b>	<b>-</b>	<b>E</b>
	①	②	③	④	⑤	⑥	⑦		⑧

- 1** - Current rating (2 x 3 A)
- 2** - Circuit configuration:  
C = Common cathode
- 3** - Package:
  - U = I-PAK
  - W = D-PAK
- 4** - T = Trench
- 5** - Voltage rating (10 = 100 V)
- 6** - TO-252AA (D-PAK)
- 7** - D-PAK, I-PAK:  
None = Tube (75 pieces)  
D-PAK only:
  - TR = Tape and reel
  - TRL = Tape and reel (left oriented)
  - TRR = Tape and reel (right oriented)
- 8** - E = RoHS compliant and termination lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95024">www.vishay.com/doc?95024</a>
Part marking information	<a href="http://www.vishay.com/doc?95097">www.vishay.com/doc?95097</a>



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