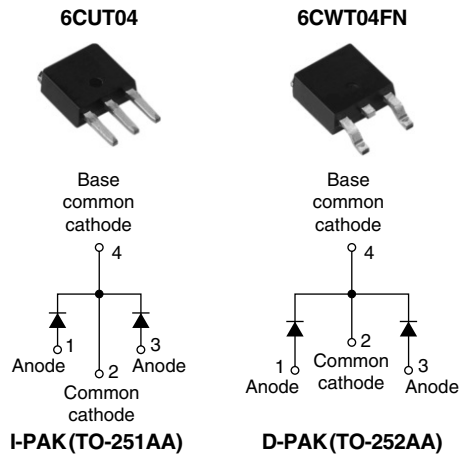


High Performance Schottky Generation 5.0, 2 x 3 A



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
- Fully lead (Pb)-free and RoHS compliant devices
- Qualified for AEC Q101


**RoHS
COMPLIANT**

APPLICATIONS

- Specific for PV cells bypass diode
- 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 3 A
V_{RRM}	45 V
Maximum V_F at 3 A at 125 °C	0.54 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		45	V
V_F	3 Apk, $T_J = 125$ °C (typical, per leg)	0.46	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	6CUT04 6CWT04FN	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 per device	$I_{F(AV)}$	50 % duty cycle at $T_C = 166\text{ }^\circ\text{C}$, 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	Following any rated load condition and with rated V_{RRM} applied	440	A
		10 ms sine or 6 ms rect. pulse		70	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 1.3\text{ A}$, $L = 16\text{ mH}$		14	mJ
Repetitive avalanche current per leg	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

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Forward voltage drop per leg	$V_{FM}^{(1)}$	3 A	$T_J = 25\text{ }^\circ\text{C}$	0.535	0.600	V
		6 A		0.615	0.680	
		3 A	$T_J = 125\text{ }^\circ\text{C}$	0.485	0.540	
		6 A		0.570	0.640	
Reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	-	25	μA
		$T_J = 125\text{ }^\circ\text{C}$		-	3	mA
Junction capacitance per leg	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		240	-	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/ μs

Notes(1) Pulse width < 300 μs , 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		6CUT04	
		Case style D-PAK		6CWT04FN	

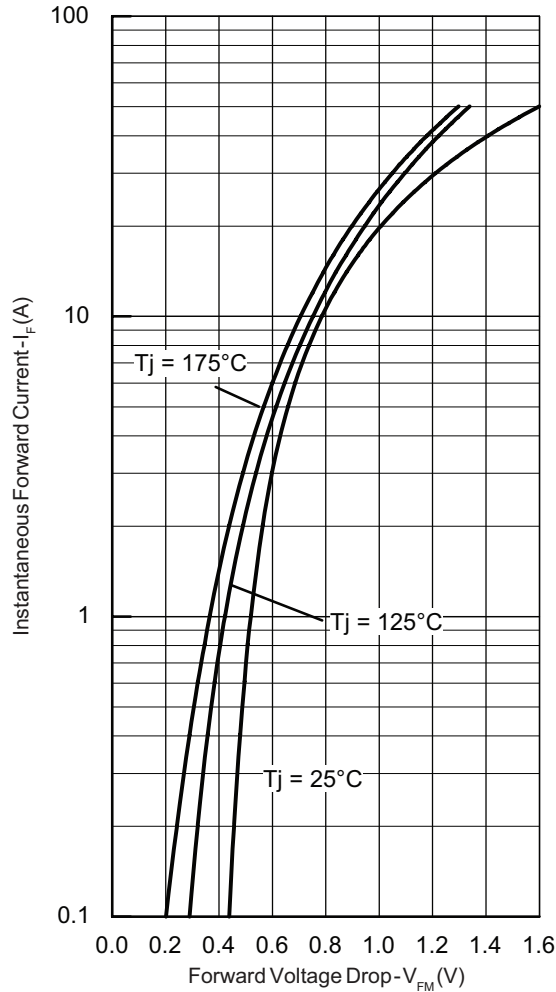


Fig. 1 - Maximum Forward Voltage Drop Characteristics

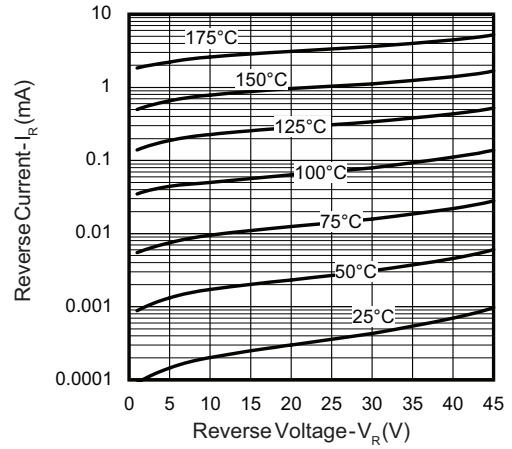


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

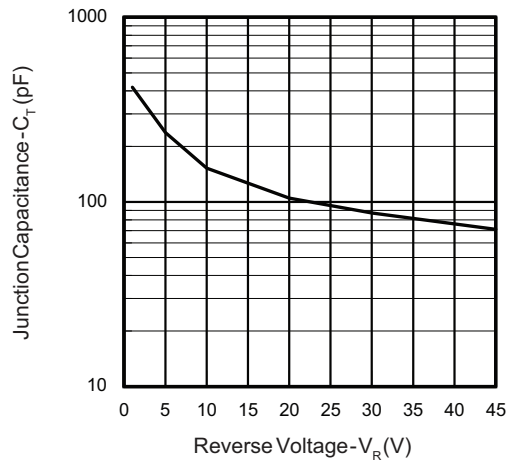


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

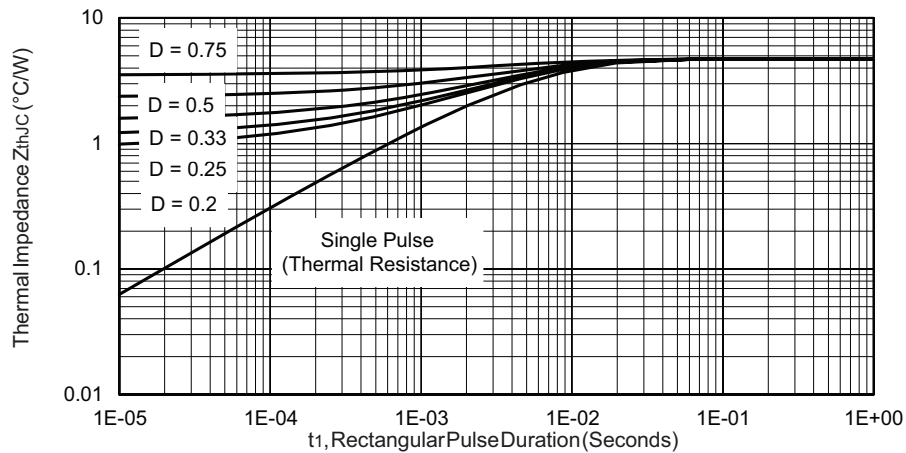


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

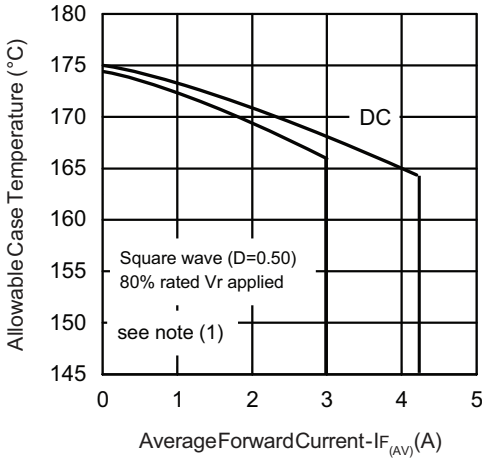


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

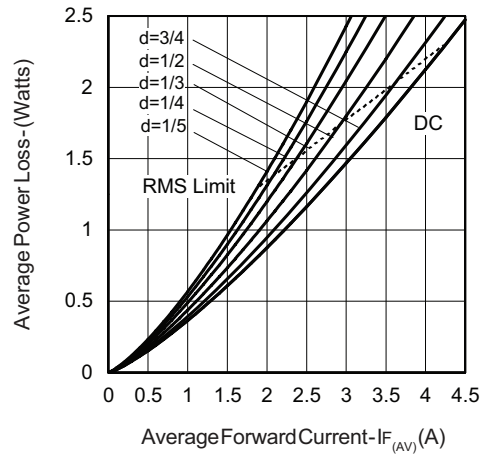


Fig. 6 - Forward Power Loss Characteristics

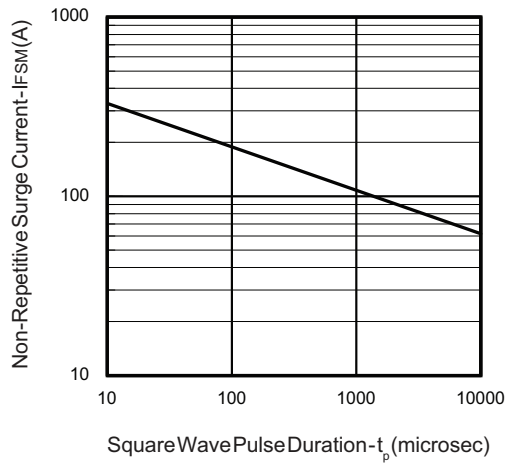


Fig. 7 - Maximum Non-Repetitive Surge Current

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

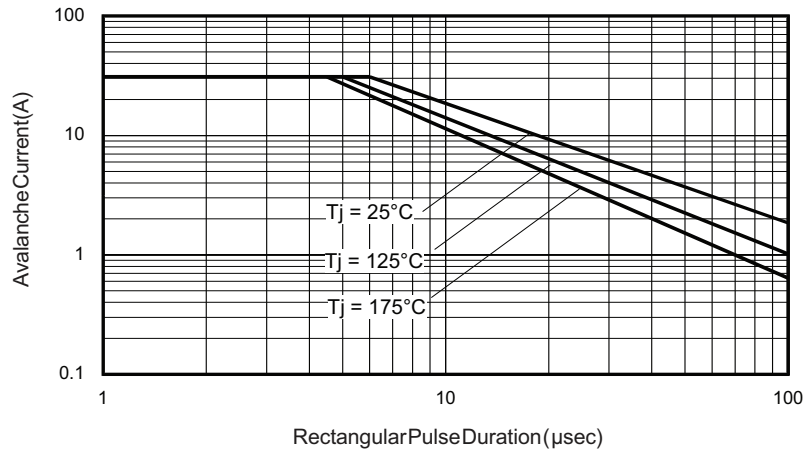


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

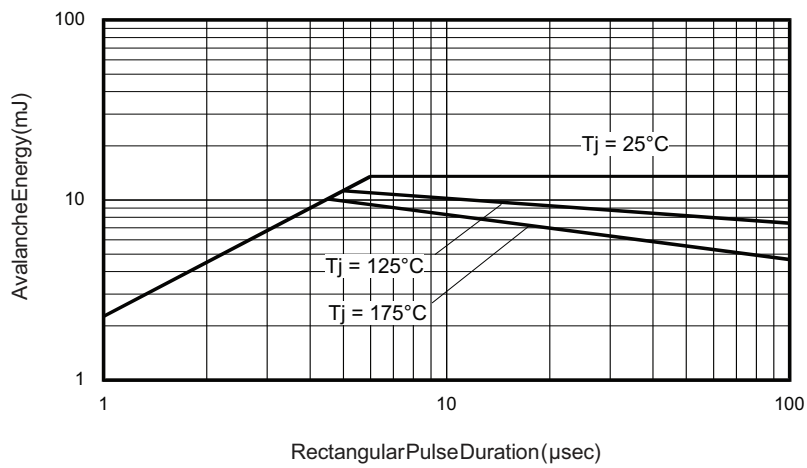


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

6CUT04, 6CWT04FN

Vishay High Power Products

High Performance
Schottky Generation 5.0, 2 x 3 A



ORDERING INFORMATION TABLE

Device code	6	C	U	T	04	FN	TRL
	①	②	③	④	⑤	⑥	⑦

- 1** - Current rating (6 A)
- 2** - Circuit configuration:
 - C = Common cathode
- 3** - Package:
 - U = I-PAK
 - W = D-PAK
- 4** - T = Trench
- 5** - Voltage rating (04 = 45 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)

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95024
Part marking information	http://www.vishay.com/doc?95025
Packaging information	http://www.vishay.com/doc?95033
SPICE model	http://www.vishay.com/doc?95038



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