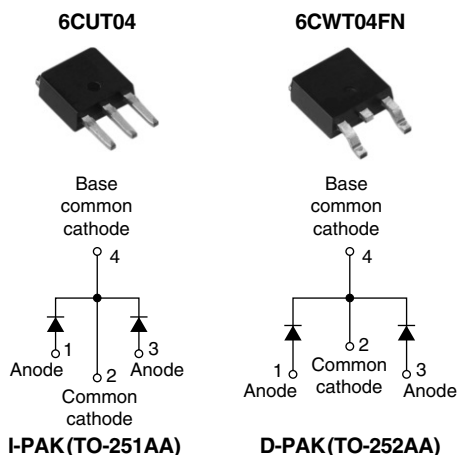


High Performance Schottky Generation 5.0, 2 x 3 A



FEATURES

- 175 °C high performance Schottky diode
- Very low forward voltage drop
- Extremely low reverse leakage
- Optimized V_F vs. I_F 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 pybass 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 °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 °C, I _{AS} = 1.3 A, L = 16 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 max. I _{AS} at T _J max. as a function of time pulse (see fig. 8)		I _{AS} at T _J 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	

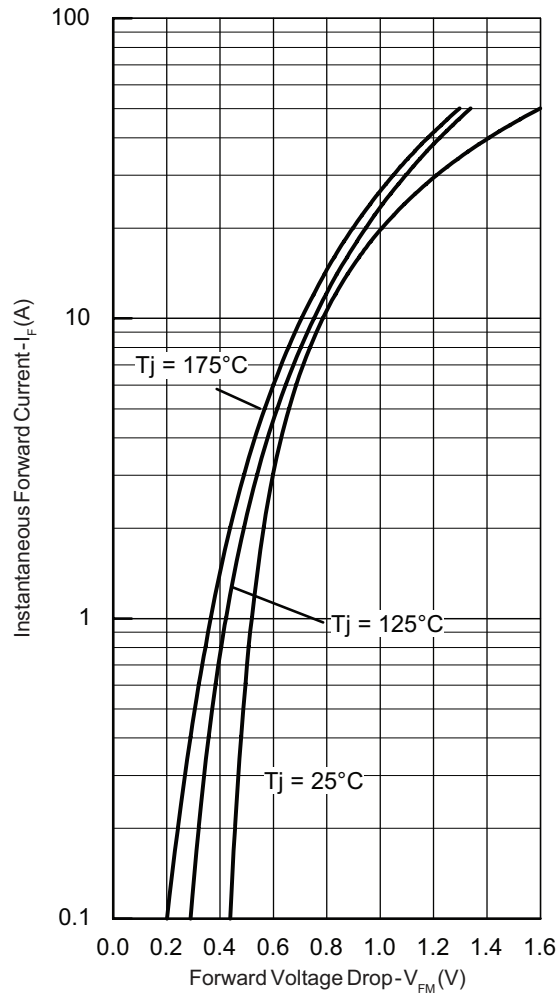


Fig. 1 - Maximum Forward Voltage Drop Characteristics

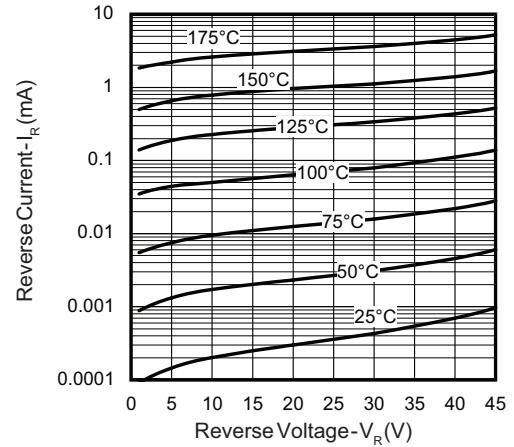


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

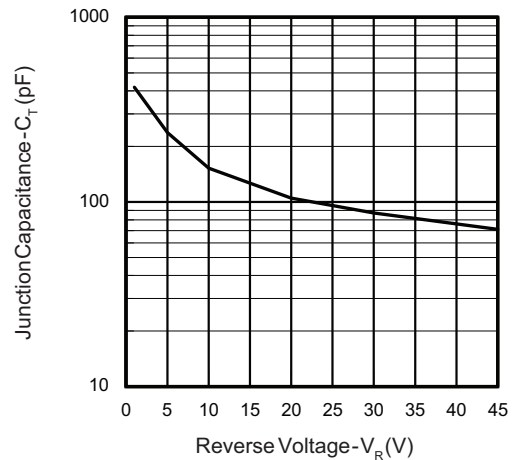


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

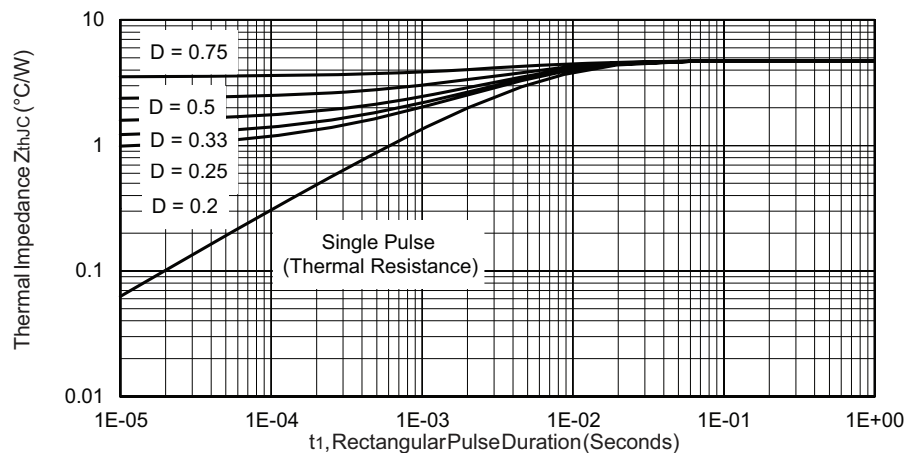


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

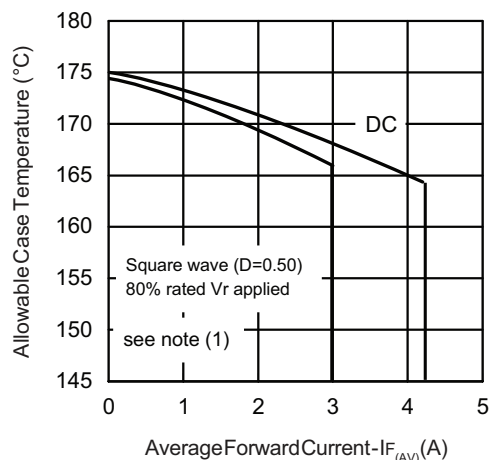


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

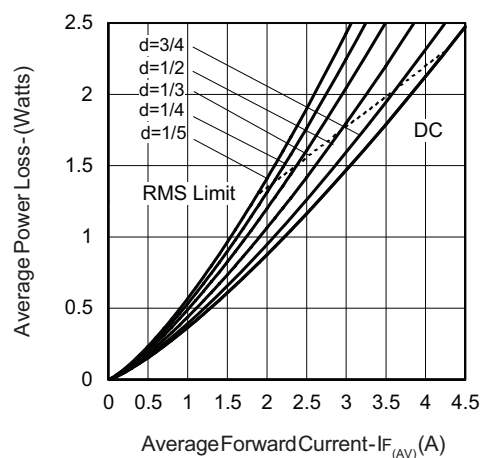


Fig. 6 - Forward Power Loss Characteristics

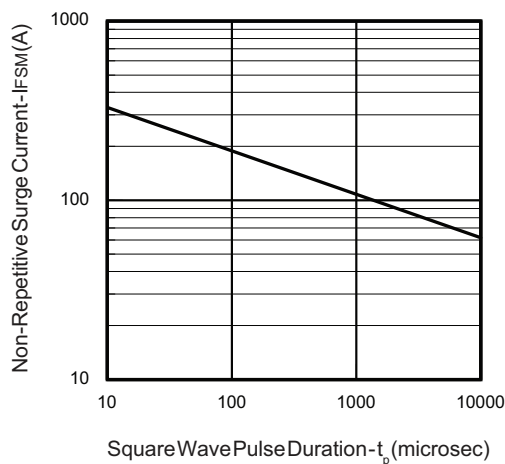


Fig. 7 - Maximum Non-Repetitive Surge Current

Note

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

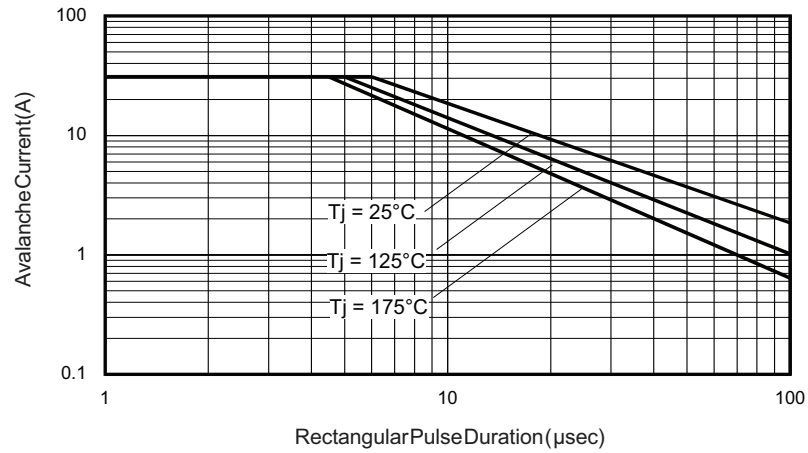


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

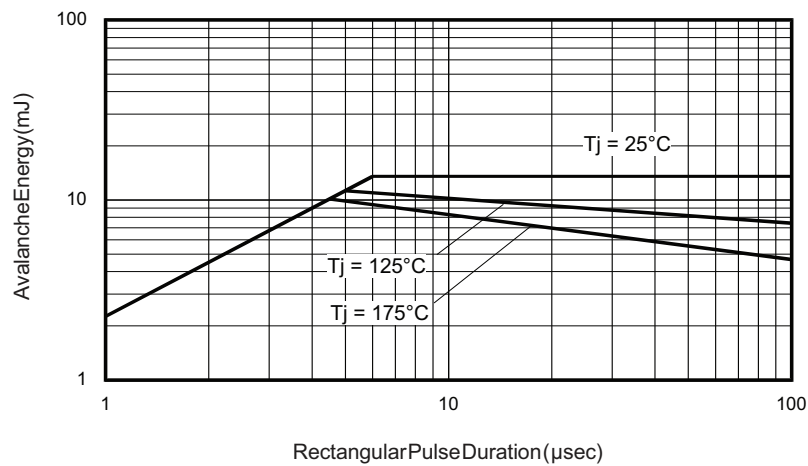


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

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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