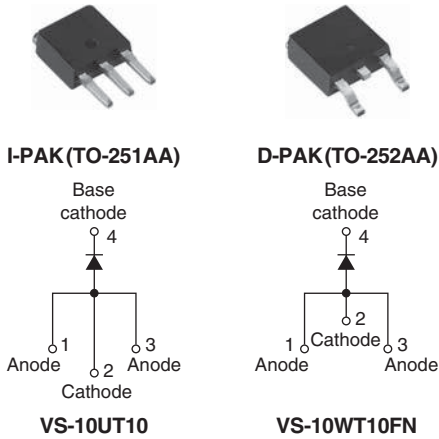


High Performance Schottky Generation 5.0, 10 A



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


RoHS
 COMPLIANT

APPLICATIONS

- High efficiency SMPS
- High frequency switching
- Output rectification
- Reverse battery protection
- Freewheeling
- DC/DC systems
- Increased power density systems

PRODUCT SUMMARY

Package	D-PAK (TO-252AA), I-PAK (TO-251AA)
$I_{F(AV)}$	10 A
V_R	100 V
V_F at I_F	0.66 V
I_{RM} max.	4 mA at 125 °C
T_J max.	175 °C
Diode variation	Single die
E_{AS}	54 mJ

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		100	V
V_F	10 Apk, $T_J = 125$ °C (typical)	0.615	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VS-10UT10 VS-10WT10FN	UNITS
Maximum DC reverse voltage	V_R	$T_J = 25$ °C	100	V

VS-10UT10, VS-10WT10FN



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ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 159\text{ }^\circ\text{C}$, rectangular waveform		10	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	610	A
		10 ms sine or 6 ms rect. pulse		110	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 3\text{ A}$, $L = 12\text{ mH}$		54	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

Note

(1) Measured connecting 2 anode pins

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Forward voltage drop	$V_{FM}^{(1)(2)}$	5 A	$T_J = 25\text{ }^\circ\text{C}$	0.630	-	V
		10 A		0.735	0.810	
		20 A		0.840	0.890	
		5 A	$T_J = 125\text{ }^\circ\text{C}$	0.530	-	
		10 A		0.615	0.660	
		20 A		0.730	0.770	
Reverse leakage current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	-	50	μA
		$T_J = 125\text{ }^\circ\text{C}$		-	4	mA
Junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		400	-	pF
Series inductance	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 %

(2) Only 1 anode pin connected

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	R_{thJC}	DC operation		2	$^\circ\text{C/W}$
Typical thermal resistance, case to heatsink	R_{thCS}			0.3	
Approximate weight				0.3	g
				0.01	oz.
Marking device		Case style I-PAK		10UT10	
		Case style D-PAK		10WT10FN	

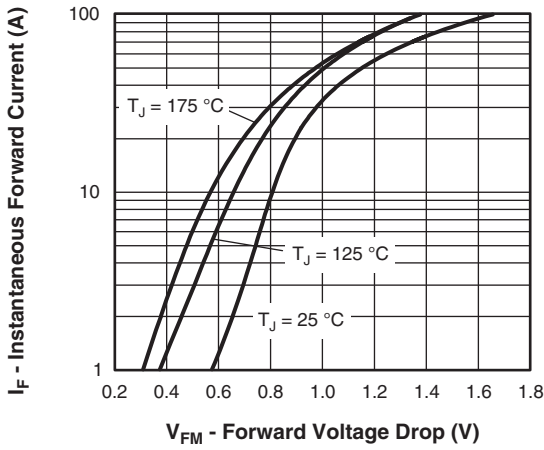


Fig. 1 - Maximum Forward Voltage Drop Characteristics

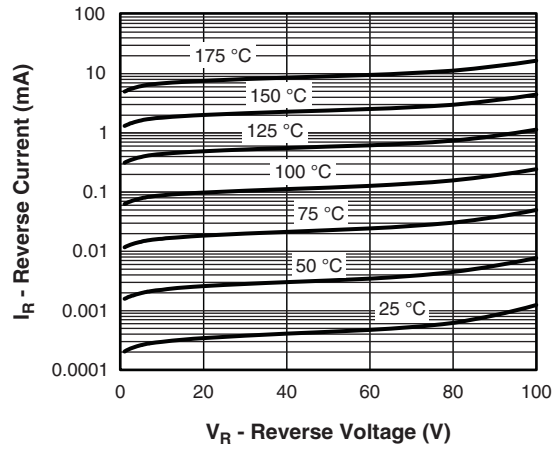


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

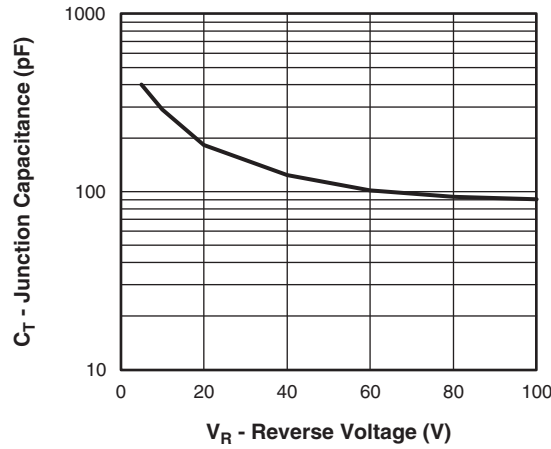


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

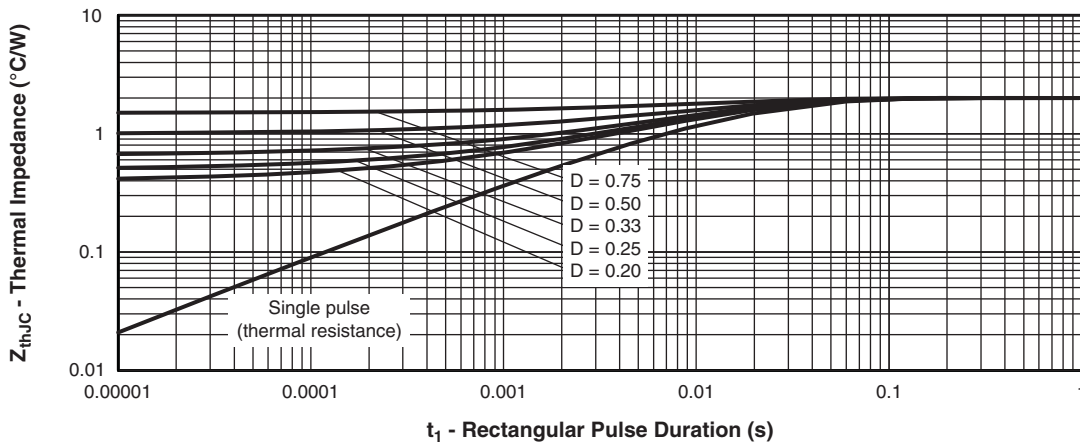


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

VS-10UT10, VS-10WT10FN



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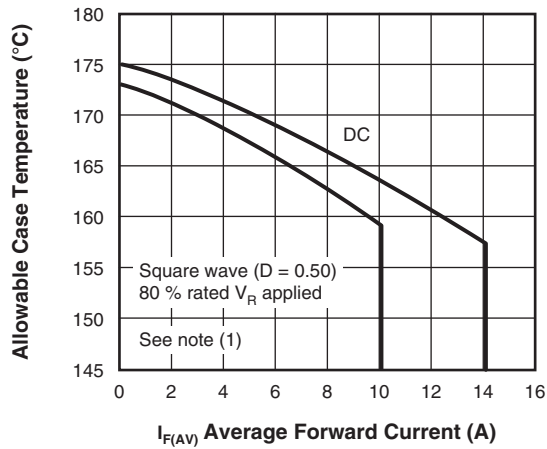


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

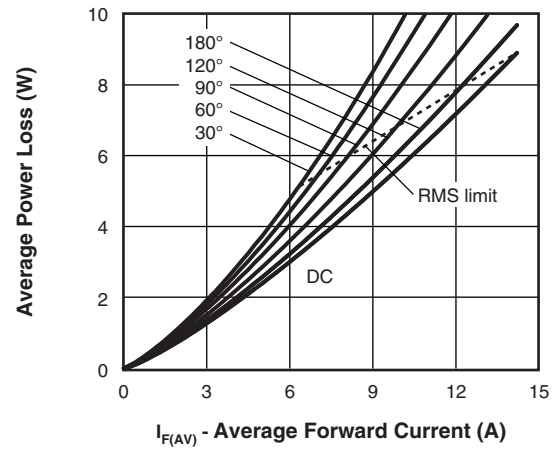


Fig. 6 - Forward Power Loss Characteristics

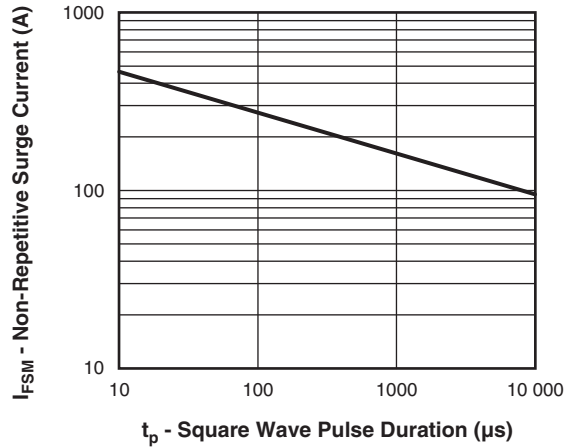


Fig. 7 - Maximum Non-Repetitive Surge Current

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = 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

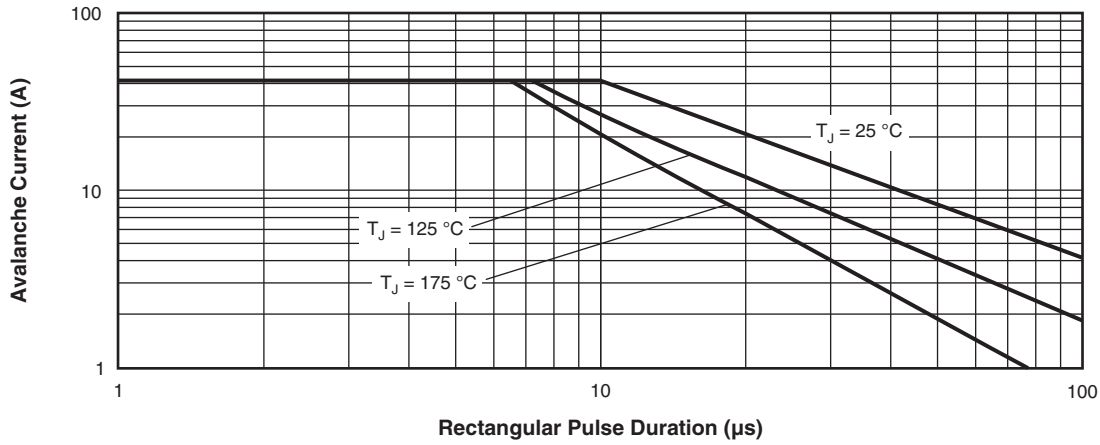


Fig. 8 - Reverse Bias Safe Operating Area (Avalanche Current vs. Rectangular Pulse Duration)

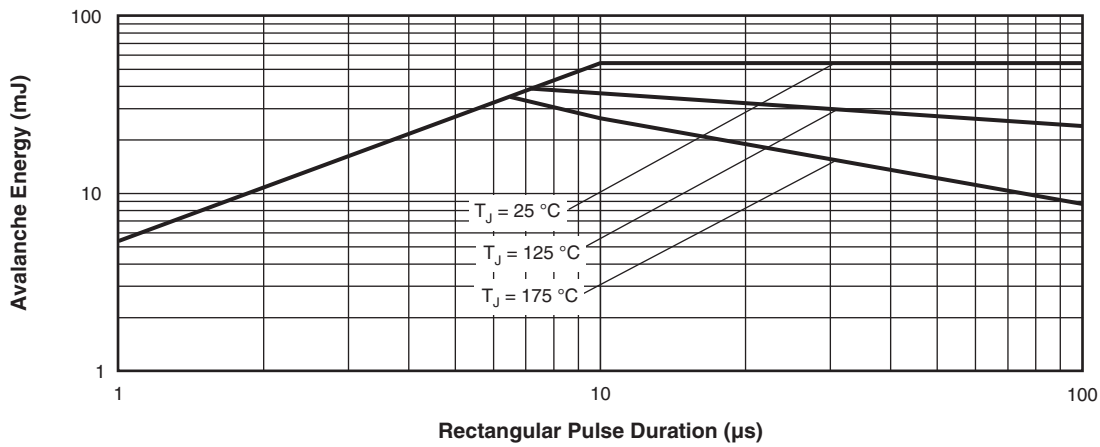


Fig. 9 - Reverse Bias Safe Operating Area (Avalanche Energy vs. Rectangular Pulse Duration)

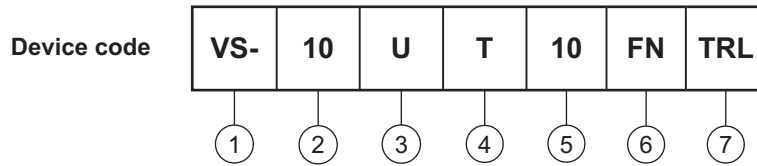
VS-10UT10, VS-10WT10FN

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ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (10 A)
- 3** - Package:
 - U = I-PAK
 - W = D-PAK
- 4** - T = Trench
- 5** - Voltage code (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)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95024
Part marking information	www.vishay.com/doc?95025
Packaging information	www.vishay.com/doc?95033
SPICE model	www.vishay.com/doc?95026



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