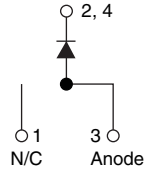


Ultralow V_F Ultrafast Rectifier, 6 A FRED Pt[®]


D-PAK (TO-252AA)


FEATURES

- Hyperfast recovery time, reduced Q_{rr} and soft recovery
- 175 °C maximum operating junction temperature
- For PFC CRM/CCM operation
- Low forward voltage drop
- Low leakage current
- AEC-Q101 qualified
- Meets JESD 201 class 2 whisker test
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

PRODUCT SUMMARY	
Package	D-PAK (TO-252AA)
$I_{F(AV)}$	6 A
V_R	600 V
V_F at I_F	2.1 V
t_{rr} (typ.)	18 ns
T_J max.	175 °C
Diode variation	Single die

DESCRIPTION/APPLICATIONS

State of the art hyperfast recovery rectifiers designed with optimized performance of forward voltage drop, hyperfast recovery time, and soft recovery.

The planar structure and the platinum doped life time control guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in PFC boost stage in the AC/DC section of SMPS inverters or as freewheeling diodes. Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

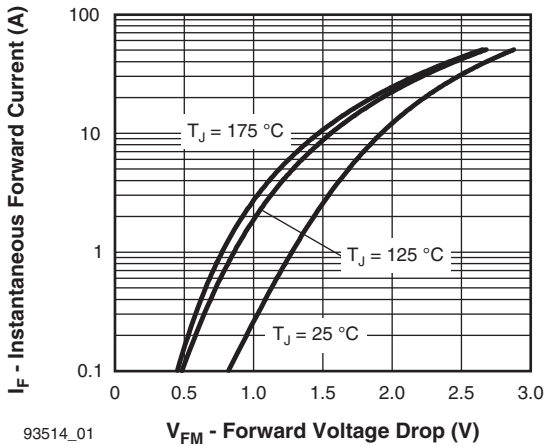
ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		600	V
Average rectified forward current	$I_{F(AV)}$	$T_C = 144$ °C	6	A
Non-repetitive peak surge current	I_{FSM}	$T_J = 25$ °C	70	
Peak repetitive forward current	I_{FM}	$T_C = 144$ °C, $f = 20$ kHz, $d = 50$ %	12	
Operating junction and storage temperatures	T_J, T_{Stg}		- 65 to 175	°C

ELECTRICAL SPECIFICATIONS ($T_J = 25$ °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100$ μ A	600	-	-	V
Forward voltage	V_F	$I_F = 6$ A $I_F = 6$ A, $T_J = 150$ °C	-	1.60 1.26	2.1 1.7	
Reverse leakage current	I_R	$V_R = V_R$ rated $T_J = 150$ °C, $V_R = V_R$ rated	-	-	50 250	μ A
Junction capacitance	C_T	$V_R = 600$ V	-	3.5	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8	-	nH



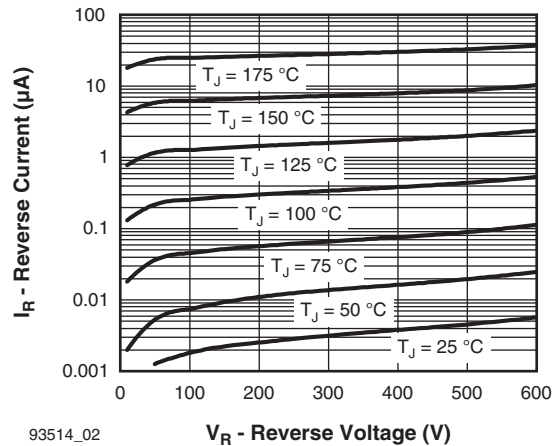
DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$I_F = 1\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	18	25	ns
		$I_F = 1\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	22	-	
		$T_J = 25\text{ }^\circ\text{C}$	-	27	-	
		$T_J = 125\text{ }^\circ\text{C}$	-	37	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^\circ\text{C}$	-	4.1	-	A
		$T_J = 125\text{ }^\circ\text{C}$	-	5.3	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^\circ\text{C}$	-	57	-	nC
		$T_J = 125\text{ }^\circ\text{C}$	-	103	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 65	-	175	$^\circ\text{C}$
Thermal resistance, junction to case per leg	R_{thJC}		-	-	3	$^\circ\text{C}/\text{W}$
Approximate weight			0.3			g
			0.01			oz.
Marking device		Case style D-PAK	6EWH06FNH			



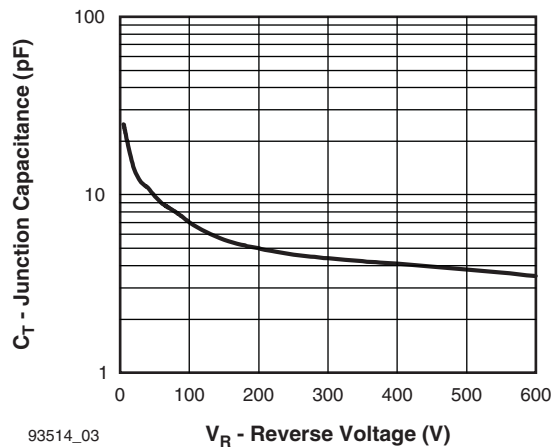
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Fig. 1 - Typical Forward Voltage Drop Characteristics



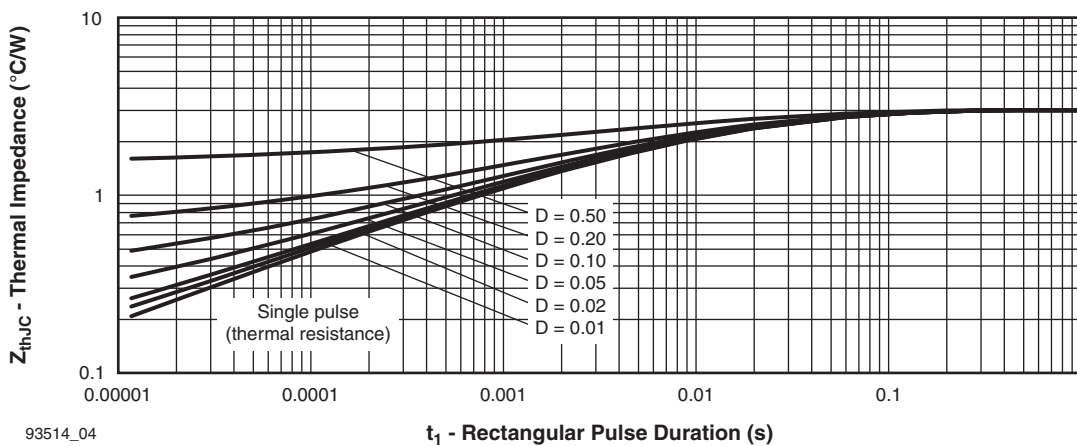
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Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



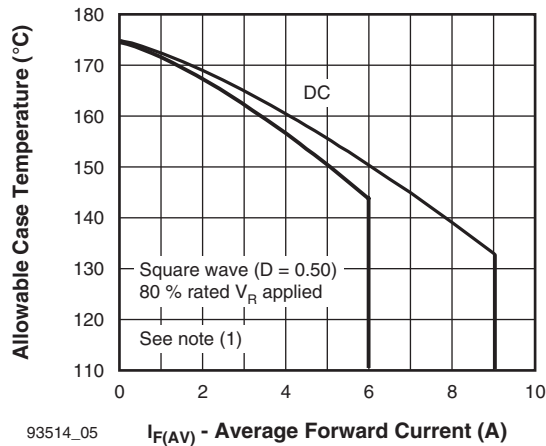
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Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



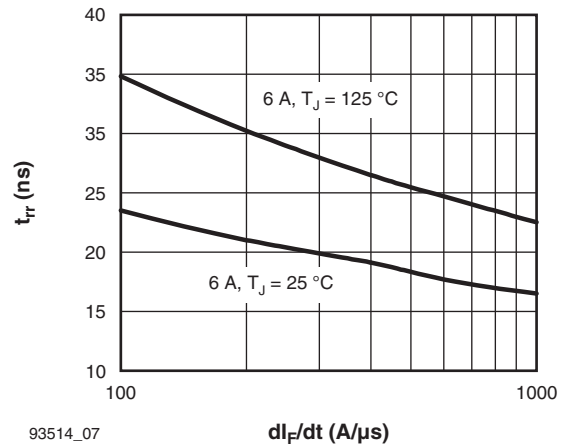
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Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



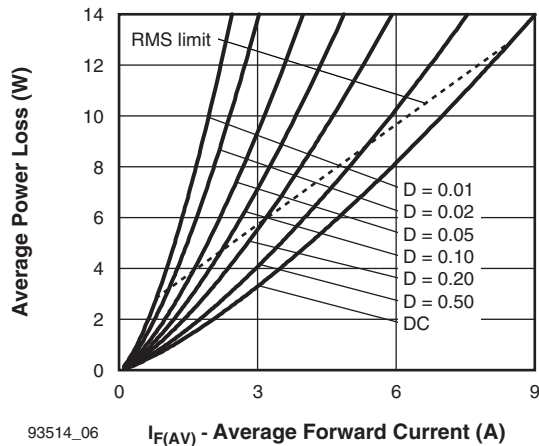
93514_05 $I_{F(AV)}$ - Average Forward Current (A)

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



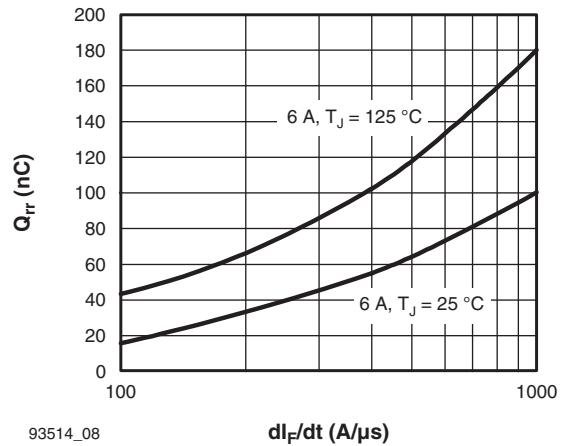
93514_07 dI_F/dt (A/μs)

Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt



93514_06 $I_{F(AV)}$ - Average Forward Current (A)

Fig. 6 - Forward Power Loss Characteristics



93514_08 dI_F/dt (A/μs)

Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

- (1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 Pd_{REV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R

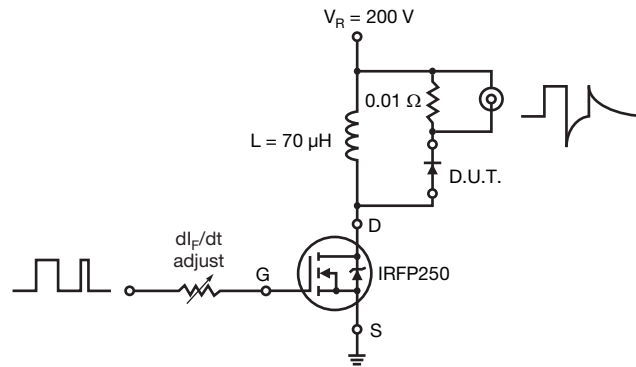
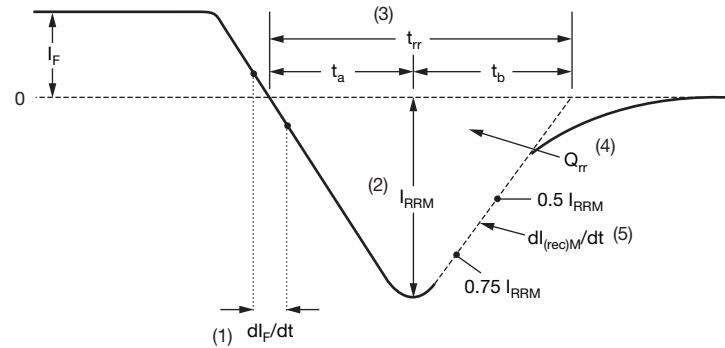


Fig. 9 - Reverse Recovery Parameter Test Circuit

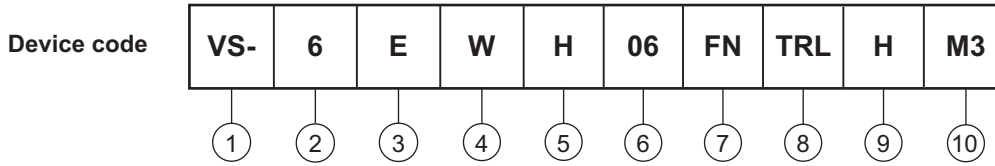


- | | |
|---|---|
| <p>(1) dI_F/dt - rate of change of current through zero crossing</p> <p>(2) I_{RRM} - peak reverse recovery current</p> <p>(3) t_{rr} - reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through $0.75 I_{RRM}$ and $0.50 I_{RRM}$ extrapolated to zero current.</p> | <p>(4) Q_{rr} - area under curve defined by t_{rr} and I_{RRM}</p> $Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$ <p>(5) $dI_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}</p> |
|---|---|

Fig. 10 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (6 = 6 A)
- 3** - Circuit configuration:
E = Single diode
- 4** - Package identifier:
W = D-PAK
- 5** - H = Hyperfast recovery
- 6** - Voltage rating (06 = 600 V)
- 7** - FN = TO-252AA
- 8** -
 - None = Tube
 - TR = Tape and reel
 - TRL = Tape and reel (left oriented)
 - TRR = Tape and reel (right oriented)
- 9** - H = AEC-Q101 qualified
- 10** - Environmental digit:
M3 = Halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-6EWH06FNHM3	75	3000	Antistatic plastic tube
VS-6EWH06FNTRHM3	2000	2000	13" diameter reel
VS-6EWH06FNTRRHM3	3000	3000	13" diameter reel
VS-6EWH06FNTRLHM3	3000	3000	13" diameter reel

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95519
Part marking information	www.vishay.com/doc?95518
Packaging information	www.vishay.com/doc?95033



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Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.



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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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