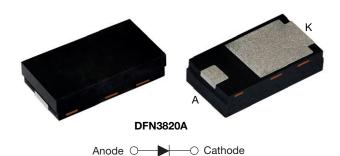
Vishay Semiconductors

Ultrafast Rectifier, 5 A FRED Pt®



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LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS					
I _{F(AV)}	5 A				
V _R	200 V				
V _F at I _F	0.72 V				
t _{rr} (typ.)	15 ns				
I _{FSM}	102 A				
T _J max.	175 °C				
Package	DFN3820A				
Circuit configuration	Single				

FEATURES

- Very low profile typical height of 0.88 mm
- Ideal for automated placement
- Wettable flanks allows easy inspection with AOI (automated optical inspection). No X-ray necessary
- Low forward voltage drop, low power losses
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- For PFC, CRM snubber operation
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in high frequency inverters, DC/DC converters, freewheeling diodes, clamping and snubber, polarity protection, and LED lighting

MECHANICAL DATA

Case: DFN3820A

Molding compound meets UL 94 V-0 flammability rating

Terminals: matte tin plated leads, solderable per J-STD-002, meets JESD 201 class 2 whisker test **Polarity:** color band denotes cathode end

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS		
Peak repetitive reverse voltage	V _{RRM}		200	V		
Average rectified forward current	I _{F(AV)}	T _M = 154 °C	5	^		
Non-repetitive peak surge current	I _{FSM}	$T_J = 25 \ ^{\circ}C$, 10 ms sine pulse	102	A		
Operating junction and storage temperatures	T _J , T _{Stg}		-55 to +175	°C		

ELECTRICAL SPECIFICATIONS ($T_J = 25 \text{ °C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Breakdown voltage, blocking voltage	V_{BR} , V_{R}	I _R = 100 μA	200	-	-		
Forward voltage	V	I _F = 5 A	-	0.88	0.97	V	
Forward voltage	V _F	I _F = 5 A, T _J = 150 °C	-	0.72	0.79		
Deverse leakerse eurrent	I	V _R = V _R rated	-	-	4		
Reverse leakage current	IR	$T_J = 150 \text{ °C}, V_R = V_R \text{ rated}$	-	-	50	μΑ	
Junction capacitance	CT	V _R = 200 V	-	19	-	pF	

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FREE



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DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CO	TEST CONDITIONS MIN. TYP			MAX.	UNITS
		$I_{\rm F} = 0.5 \text{ A}, I_{\rm R} = 1 \text{ A}$	A, I _{rr} = 0.25 A	-	15	25	
Reverse recovery time	t _{rr}	T _J = 25 °C		-	12	-	ns
		T _J = 125 °C		-	19	-	
Doold recovery ourrent		T _J = 25 °C	$I_F = 5 A$	-	4.1	-	A nC
Peak recovery current	IRRM	T _J = 125 °C	dI _F /dt = 500 A/µs V _R = 200 V	-	6.8	-	
Reverse recovery charge	0	T _J = 25 °C		-	27	-	
	Q _{rr}	T _J = 125 °C		-	69	-	

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS		
Maximum junction and storage temperature range	T _J , T _{Stg}		-55	-	175	°C		
Thermal resistance, junction to mount	R _{thJM} ⁽¹⁾		-	3.5	4.5			
Thermal resistance, junction to ambient	R _{thJA}	Device mounted on FR4 PCB, 2 oz. standard footprint	-	140	-	°C/W		
Weight			-	0.023	-	9		
Marking device		Case style DFN3820A		5H	-12			

Note

⁽¹⁾ Thermal resistance junction to mount follows JEDEC[®] 51-14 transient dual interface test method (TDIM)

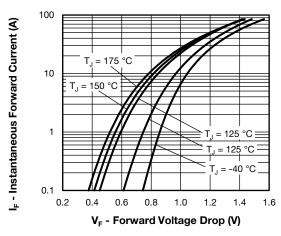


Fig. 1 - Typical Forward Voltage Drop Characteristics

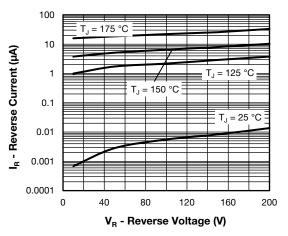


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



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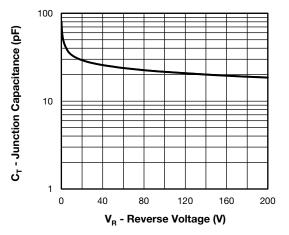


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

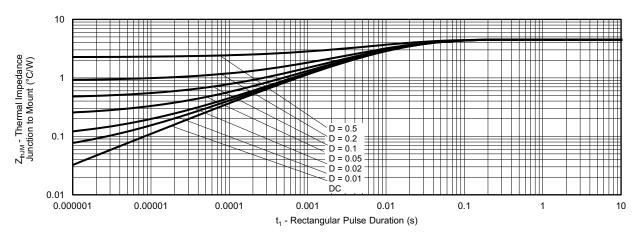
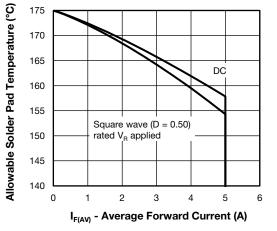
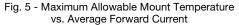


Fig. 4 - Maximum Transient Thermal Impedance, Junction to Mount





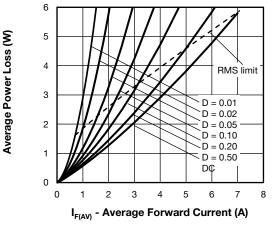


Fig. 6 - Forward Power Loss Characteristics

Note

 $\begin{array}{l} \mbox{Formula used: } T_M = T_J - (Pd + Pd_{REV}) \ x \ R_{thJM}; \\ \mbox{Pd} = \mbox{forward power loss} = I_{F(AV)} \ x \ V_{FM} \ at \ (I_{F(AV)}/D) \ (see \ fig. \ 5); \\ \mbox{Pd}_{REV} = \ inverse \ power \ loss = V_{R1} \ x \ I_R \ (1 - D); \ I_R \ at \ V_{R1} = \ rated \ V_R \end{array}$

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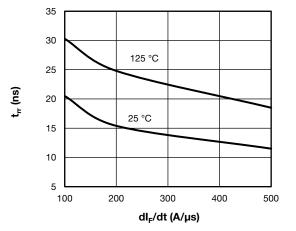
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Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

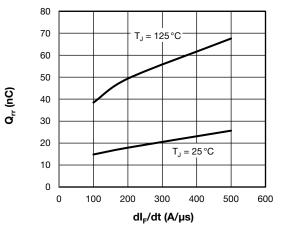


Fig. 8 - Typical Stored Charge vs. dl_F/dt

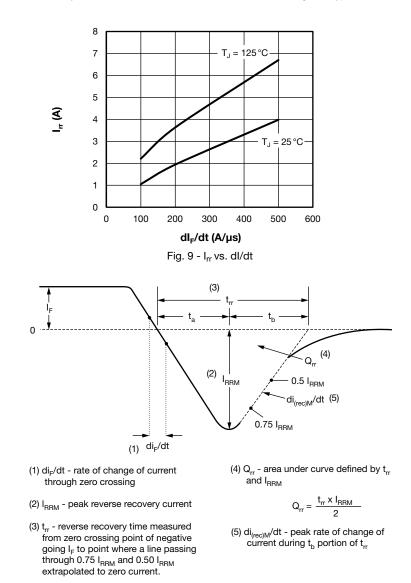


Fig. 10 - Reverse Recovery Waveform and Definitions

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ORDERING INFORMATION TABLE

		_	_	_			
Device code	VS-	5	Е	A	н	02	-M3
	1	2	3	4	5	6	7
	1 .	· Visl	nay Sen	niconduo	ctors pro	oduct	
	2 -	Cur	rent rati	ng (5 =	5 A)		
	3 -	· Circ	uit conf	iguratior	า:		
		E =	single c	liode			
	4	• A =	DFN38	20A pac	kage		
	5 -	· Pro	cess typ	e,			
		H =	ultrafas	t recove	ery		
	6 -	· Volt	age coo	le (02 =	200 V)		
	7 -	-M3	= halog	gen-free	, RoHS-	complia	ant, and

ORDERING INFORMATION (Example)							
PREFERRED P/N	PREFERRED PACKAGE CODE	BASE QUANTITY	PACKAGING DESCRIPTION				
VS-5EAH02-M3/H	н	3500	7" diameter plastic tape and reel				
VS-5EAH02-M3/I	l	14 000	13" diameter plastic tape and reel				

LINKS TO RELATED DOCUMENTS					
Dimensions	www.vishay.com/doc?97066				
Part marking information	www.vishay.com/doc?97065				
Packaging information	www.vishay.com/doc?98488				
SPICE model	www.vishay.com/doc?97098				

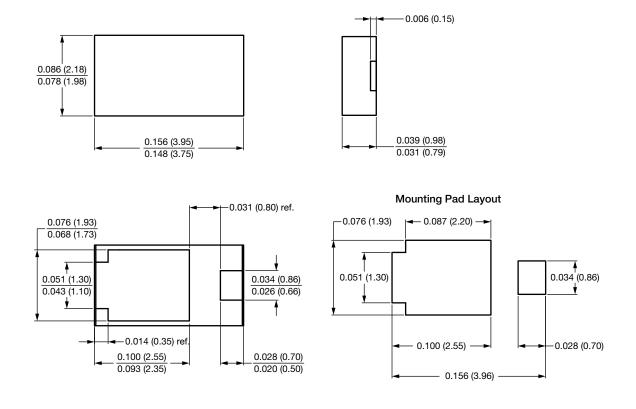






DFN3820A, FRED Pt[®]

DIMENSIONS in inches (millimeters)





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