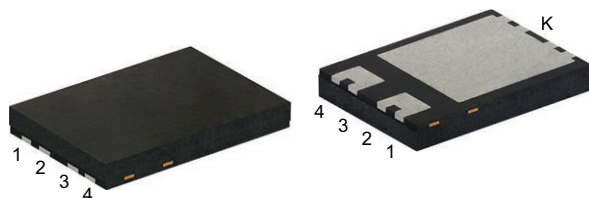
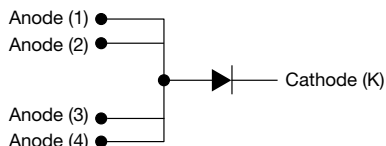


Ultrafast Rectifier, 15 A FRED Pt®


DFN6546A

AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE

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
- AEC-Q101 qualified
- For PFC, CRM snubber operation
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

Designed for high-performance automotive applications including High-frequency rectifiers, DC/DC converters, freewheeling diodes, load dump protection, clamping and snubber circuits, reverse and series polarity protection, Engine Control Unit (ECUs) and LED lighting systems.

Suitable for low power auxiliary circuitry and medium power applications.

MECHANICAL DATA

Case: DFN6546A

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

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_R	200 V
V_F at I_F	0.75 V
t_{rr} (typ.)	18 ns
I_{FSM}	264 A
T_J max.	175 °C
Package	DFN6546A
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		200	V
Average rectified forward current	$I_{F(AV)}$	$T_M = 154\text{ °C}$, $D = 0.50$	15	A
Non-repetitive peak surge current	I_{FSM}	$T_J = 25\text{ °C}$, 10 ms sine pulse	264	
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	$I_R = 100\text{ }\mu\text{A}$	200	-	-	V
Forward voltage	V_F	$I_F = 15\text{ A}$	-	0.95	1.1	
		$I_F = 15\text{ A}$, $T_J = 150\text{ °C}$	-	0.75	0.85	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	-	1	μA
		$T_J = 150\text{ °C}$, $V_R = V_R$ rated	-	-	300	
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	67	-	pF

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}	$I_F = 0.5\text{ A}$, $I_R = 1\text{ A}$, $I_{rr} = 0.25\text{ A}$	-	18	28	ns
		$T_J = 25\text{ }^{\circ}\text{C}$	-	18	-	
		$T_J = 125\text{ }^{\circ}\text{C}$	-	29	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	5.2	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	10.6	-	
		$I_F = 15\text{ A}$, $di_F/dt = 500\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	-	54	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	169	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	169	-	

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		-55	-	175	$^{\circ}\text{C}$
Thermal resistance, junction to mount	$R_{thJM}^{(1)}$		-	-	1.7	$^{\circ}\text{C}/\text{W}$
Weight			-	0.086	-	9
Marking device		Case style DFN6546A	15H2			

Note

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

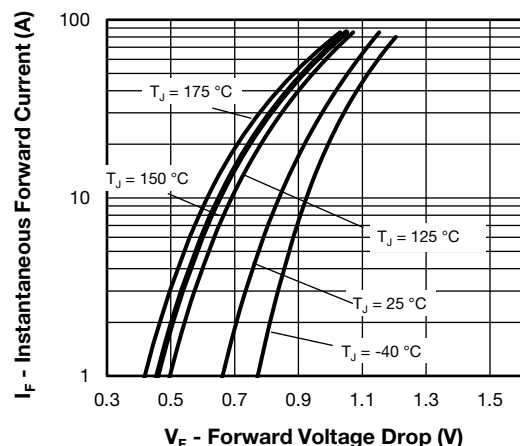


Fig. 1 - Typical Forward Voltage Drop Characteristics

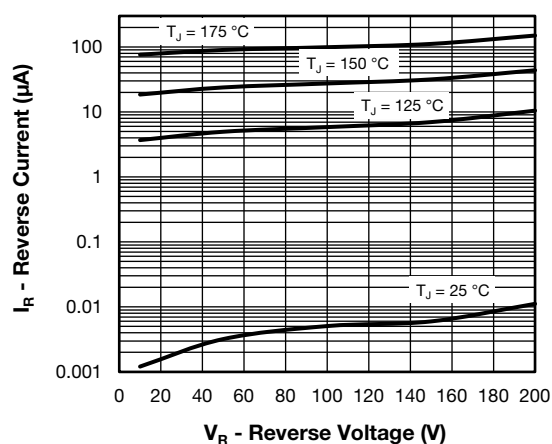


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

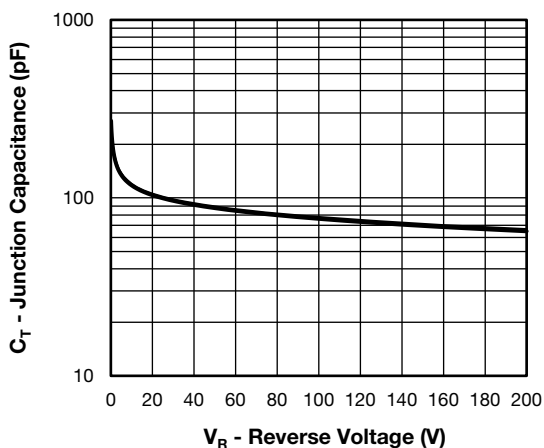


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

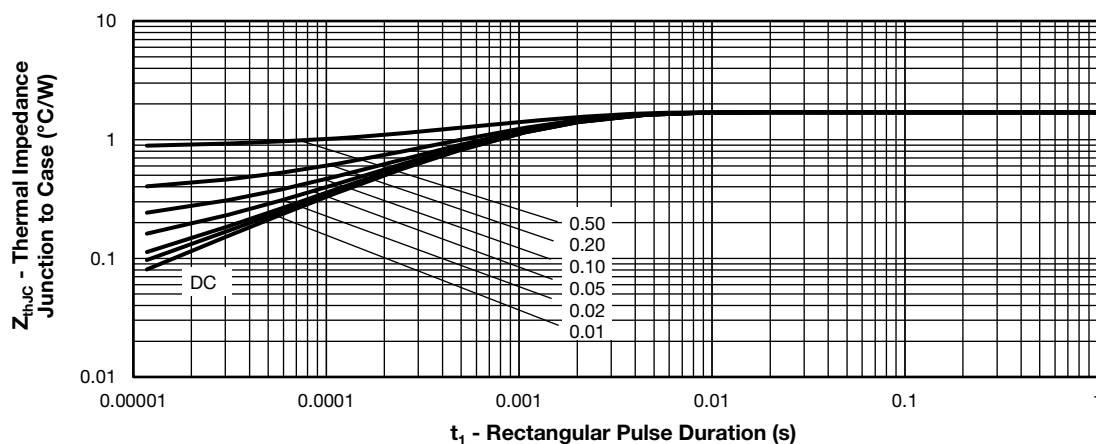


Fig. 4 - Maximum Transient Thermal Impedance, Junction to Mount

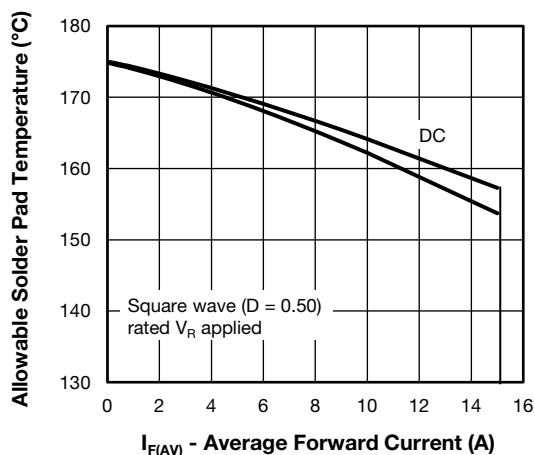


Fig. 5 - Maximum Allowable Mount Temperature vs. Average Forward Current

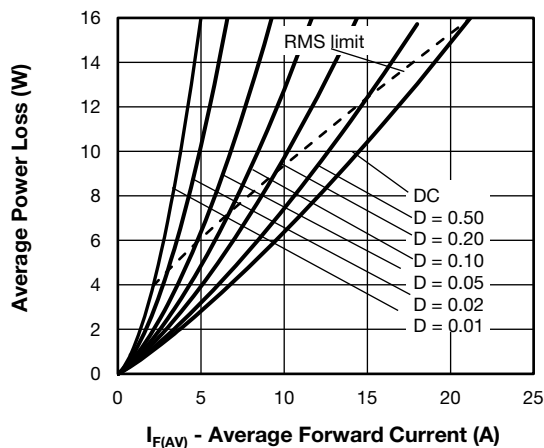
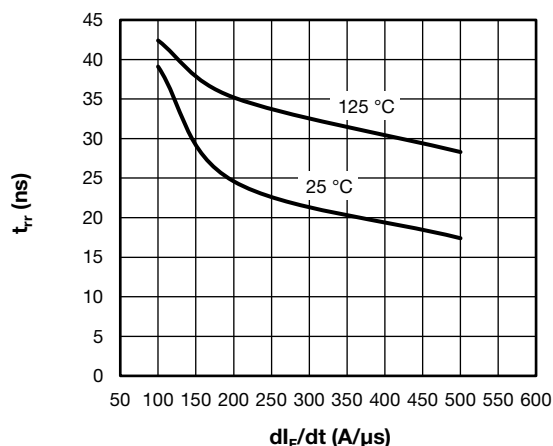
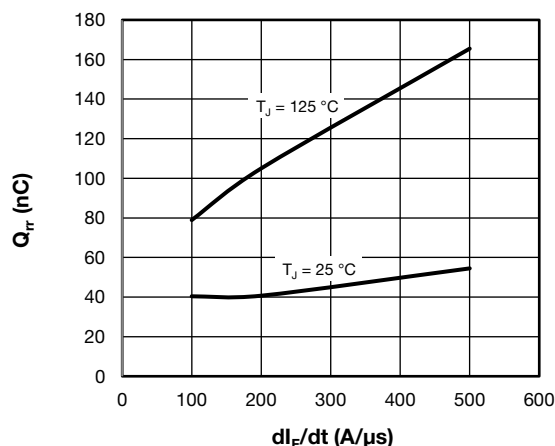
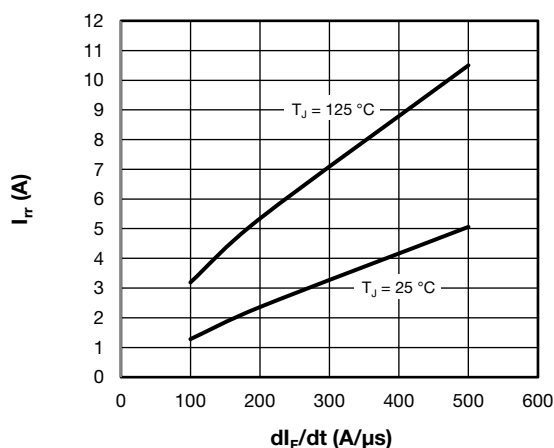
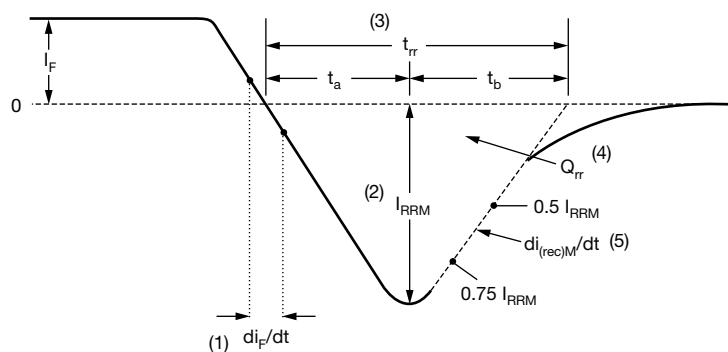


Fig. 6 - Forward Power Loss Characteristics

Note

Formula used: $T_M = T_J - (P_d + P_{dREV}) \times R_{thJM}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 5);
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = rated V_R


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

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

Fig. 9 - I_{rr} vs. di/dt


- (1) di_F/dt - rate of change of current through zero crossing
- (2) I_{RRM} - peak reverse recovery current
- (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.

- (4) Q_{rr} - area under curve defined by t_{rr} and I_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

- (5) $di_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

**ORDERING INFORMATION TABLE**

Device code	VS-	15	E	R	H	02	H	M3
	1	2	3	4	5	6	7	8
	1	2	3	4	5	6	7	8
	1	-	Vishay Semiconductors product					
	2	-	Current rating (15 = 15 A)					
	3	-	Circuit configuration:					
			E = single diode					
	4	-	R = DFN6546A package					
	5	-	Process type,					
			H = ultrafast recovery					
	6	-	Voltage code (02 = 200 V)					
	7	-	H = AEC-Q101 qualified					
	8	-	M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free					

ORDERING INFORMATION (Example)

PREFERRED P/N	PREFERRED PACKAGE CODE	BASE QUANTITY	PACKAGING DESCRIPTION
VS-15ERH02HM3/I	I	6000	13" diameter plastic tape and reel

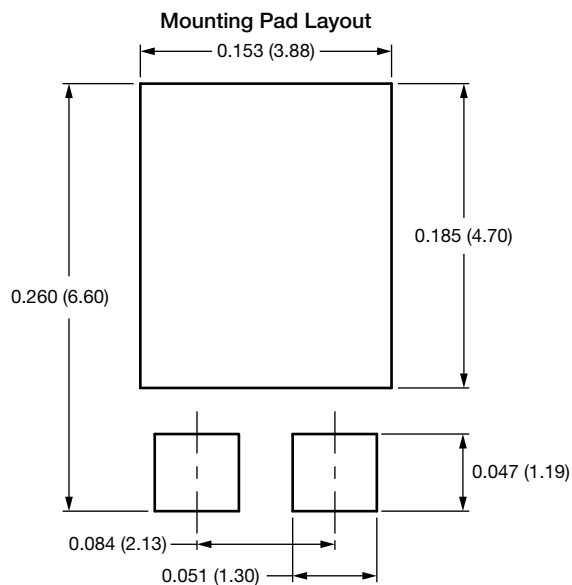
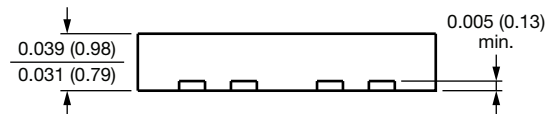
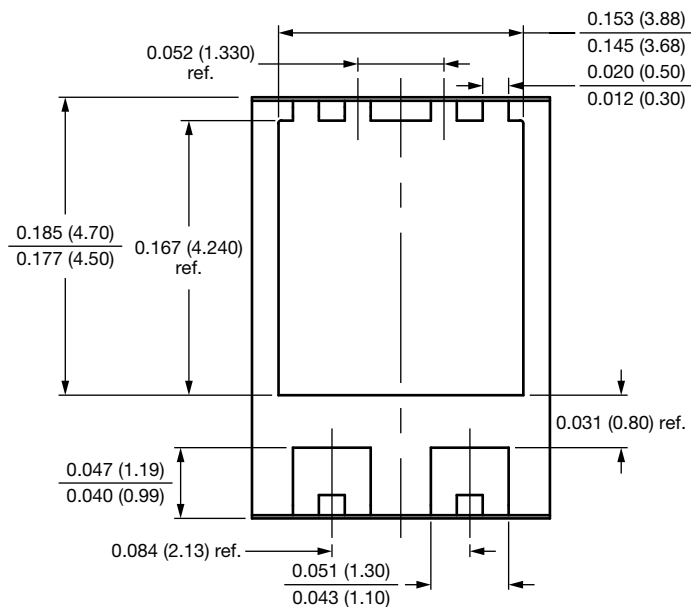
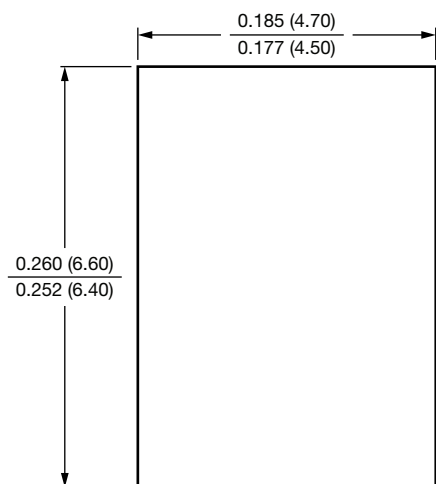
LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?97347
Part marking information	www.vishay.com/doc?97348
Packaging information	www.vishay.com/doc?98691



DFN6546A, FRED Pt®

DIMENSIONS in inches (millimeters)





Disclaimer

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