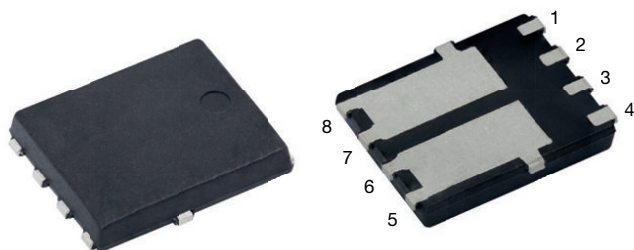


Hyperfast Rectifier, 2 x 3 A FRED Pt®



FlatPAK 5 x 6

1, 2 ○ —▶—○ 7, 8

3, 4 ○ —▶—○ 5, 6

FEATURES

- Hyperfast recovery time, reduced Q_{rr} , and soft recovery
- 175 °C maximum operating junction temperature
- Specific for output and snubber operation
- Low forward voltage drop
- Low leakage current
- AEC-Q101 qualified
- 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

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS

Package	FlatPAK 5 x 6
$I_{F(AV)}$	2 x 3 A
V_R	200 V
V_F at I_F	0.71 V
t_{rr} (typ.)	25 ns
T_J max.	175 °C
Circuit configuration	Separated cathode

DESCRIPTION / APPLICATIONS

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

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 snubber, boost, piezo-injection, as high frequency rectifiers, and freewheeling diodes.

The extremely optimized stored charge and low recovery current minimize the switching losses and reduce power dissipation in the switching element.

MECHANICAL DATA

Case: FlatPAK 5 x 6

Molding compound meets UL 94 V-0 flammability rating
Halogen-free, RoHS-compliant

Terminals: matte tin plated leads, solderable per J-STD-002, meets JESD 201 class 2 whisker test

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		200	V
Average rectified forward current	$I_{F(AV)}$	$T_{Solderpad} = 170\text{ °C}$, DC	6	A
		$T_{Solderpad} = 169\text{ °C}$, D = 0.5		
Non-repetitive peak surge current	I_{FSM}	$T_J = 25\text{ °C}$, 10 ms sinusoidal pulse	173	
			87	
Operating junction and storage temperatures	T_J, T_{Stg}		-55 to +175	°C

**ELECTRICAL SPECIFICATIONS** ($T_J = 25\text{ }^{\circ}\text{C}$ 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, per diode	V_F	$I_F = 3\text{ A}$	-	0.88	0.94	
		$I_F = 3\text{ A}, T_J = 150\text{ }^{\circ}\text{C}$	-	0.71	0.74	
Reverse leakage current, per diode	I_R	$V_R = V_R\text{ rated}$	-	-	2	μA
		$T_J = 150\text{ }^{\circ}\text{C}, V_R = V_R\text{ rated}$	-	2	40	
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	14	-	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}	$I_F = 1.0\text{ A}, dI_F/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}$	-	20	-	ns
		$I_F = 0.5\text{ A}, I_R = 1\text{ A}, I_{rr} = 0.25\text{ A}$	-	-	25	
		$T_J = 25\text{ }^{\circ}\text{C}$	-	15	-	
		$T_J = 125\text{ }^{\circ}\text{C}$	-	25	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	2	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	3	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	12	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	40	-	

THERMAL - 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 ambient, per diode	$R_{thJA}^{(1)(2)}$		-	90	103	$^{\circ}\text{C}/\text{W}$
Thermal resistance, junction to mount, per diode	$R_{thJM}^{(3)}$		-	2.3	2.6	

Notes

- (1) The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{thJA}$
(2) Free air, mounted or recommended copper pad area; thermal resistance R_{thJA} - junction to ambient
(3) Mounted on infinite heatsink

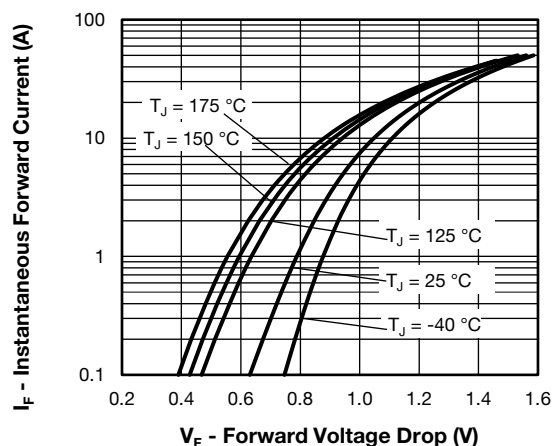


Fig. 1 - Typical Forward Voltage Drop Characteristics

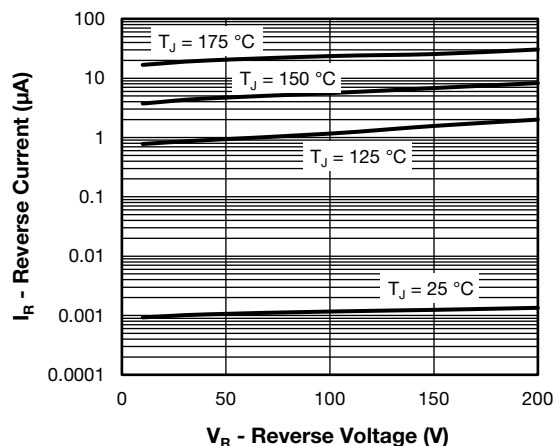


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

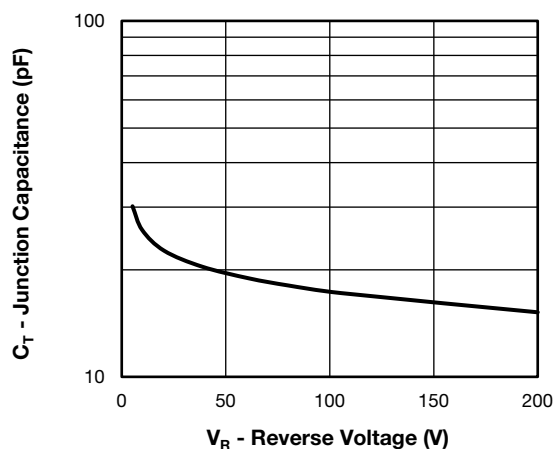
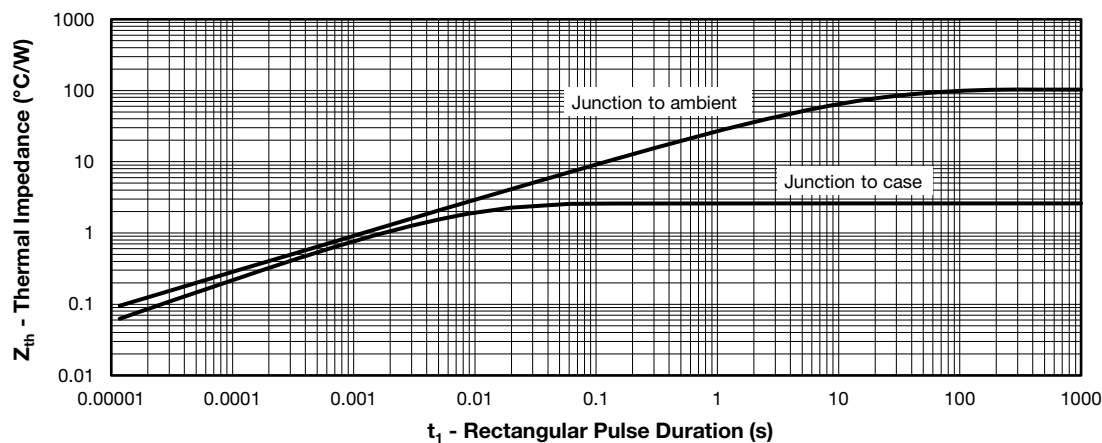


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

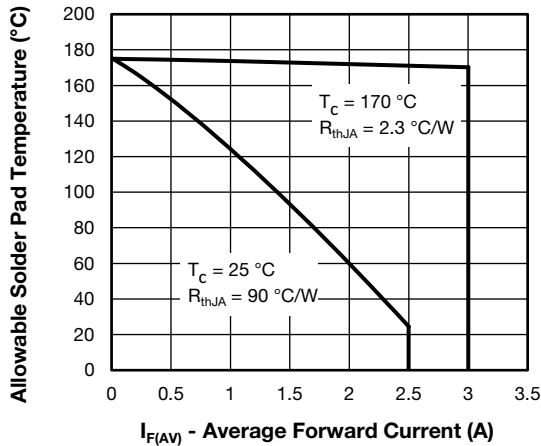


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

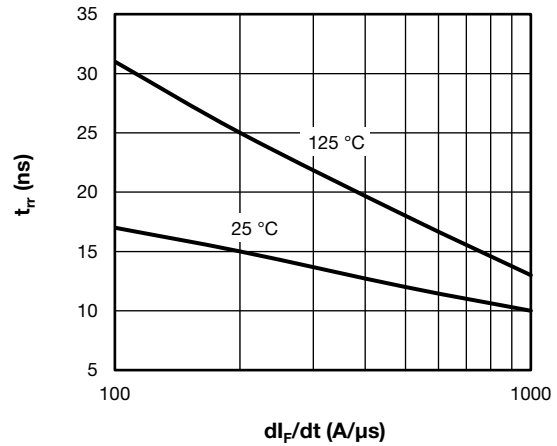


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

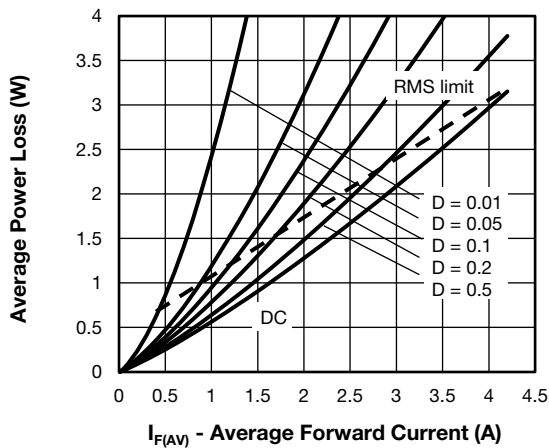


Fig. 6 - Forward Power Loss Characteristics

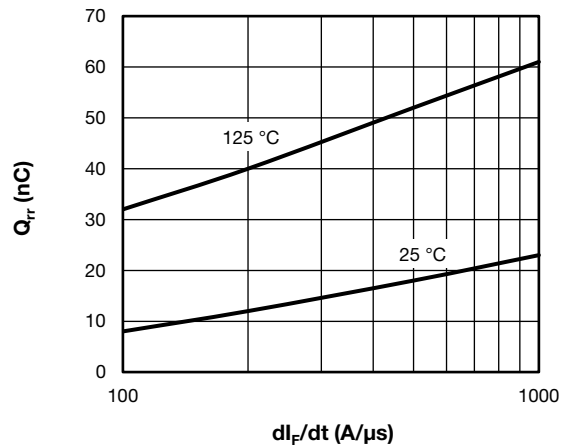


Fig. 8 - Typical Stored Charge vs. dI_F/dt

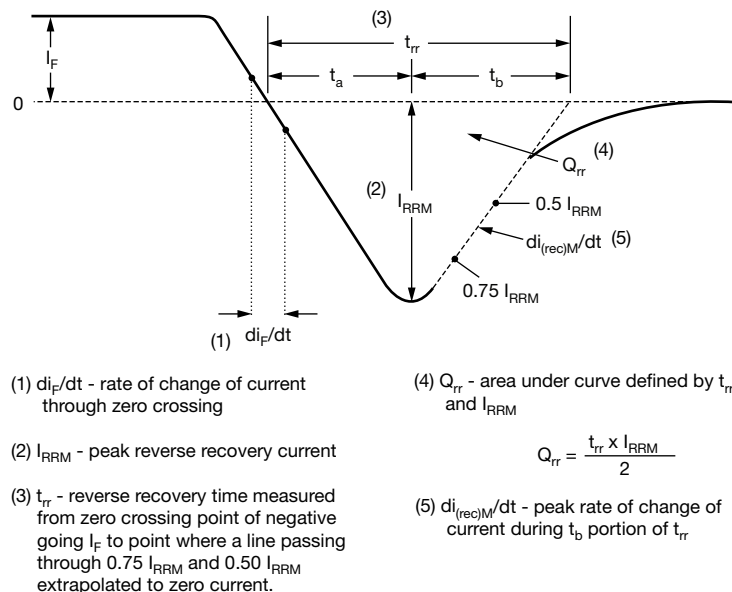


Fig. 9 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE

Device code	VS-	6	D	K	H	02	H	M3
	1	2	3	4	5	6	7	8
1	- Vishay Semiconductors product							
2	- Current rating (6 = 6 A)							
3	- Circuit configuration: D = separated cathode							
4	- K = FlatPAK package							
5	- Process type, H = hyperfast 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	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	PACKAGING DESCRIPTION
VS-6DKH02HM3/H	0.10	H	1500	7" diameter plastic tape and reel

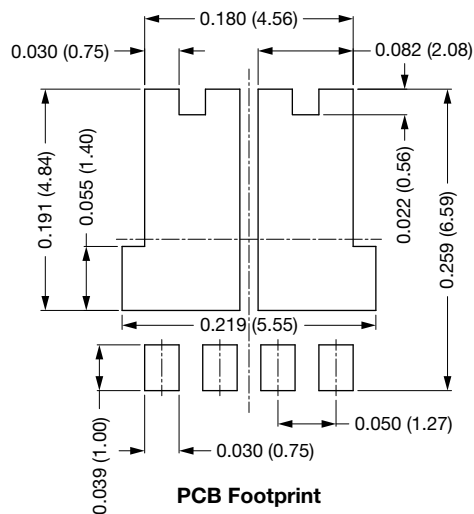
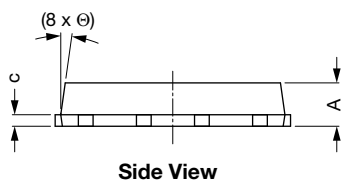
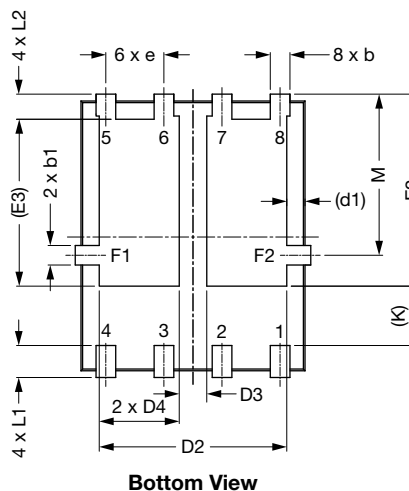
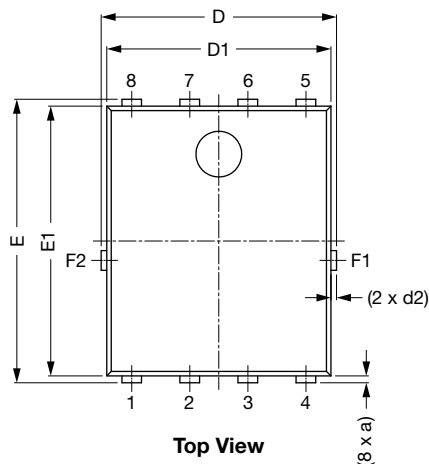
LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?96056
Part marking information	www.vishay.com/doc?96059
Packaging information	www.vishay.com/doc?88869
SPICE model	www.vishay.com/doc?96882



FlatPAK 5 x 6 (Dual)

DIMENSIONS in inches (millimeters)



DIM.	INCHES			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	0.039	0.043	0.89	0.99	1.09
(a)	-	0.006	-	-	0.15	-
b	0.013	0.017	0.020	0.32	0.43	0.52
b1	0.013	0.017	0.020	0.32	0.43	0.52
c	0.008	-	0.014	0.20	-	0.35
D	0.197	0.203	0.209	5.00	5.15	5.30
D1	0.189	0.193	0.197	4.80	4.90	5.00
D2	0.154	0.161	0.169	3.90	4.10	4.30
D3	0.020	0.024	0.031	0.50	0.60	0.80
D4	0.063	0.069	0.075	1.60	1.75	1.90
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
E	0.238	0.244	0.250	6.05	6.20	6.35



DIM.	INCHES			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
E1	0.228	0.232	0.236	5.80	5.90	6.00
E2	0.157	0.165	0.173	4.00	4.20	4.40
(E3)	-	0.144	-	-	3.65	-
e	0.050 BSC			1.27 BSC		
(K)	0.039	-	-	1.00	-	-
L1	0.019	-	0.043	0.48	-	1.10
L2	0.012	-	0.031	0.30	-	0.80
M	0.128	0.138	0.148	3.25	3.50	3.75
Θ	0°	-	10°	0°	-	10°

Notes

- Dimensioning and tolerancing per ASME Y14.5-2009
- Dimensions D1 and E1 do not include mold flash or gate burrs
- Dimension (XX) means reference only



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