AUTOMOTIVE GRADE

RoHS

COMPLIANT

HALOGEN

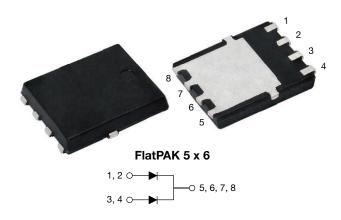
FREE



Vishay General Semiconductor

High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.62 \text{ V}$ at $I_F = 5 \text{ A}$



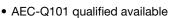
LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS						
I _{F(AV)}	2 x 7.5 A					
V _{RRM}	170 V					
I _{FSM}	130 A					
V_F at $I_F = 7.5$ A $(T_J = 125 ^{\circ}C)$	0.66 V					
T _J max.	150 °C					
Package	FlatPAK 5 x 6					
Circuit configuration	Common cathode					

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C



- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: FlatPAK 5 x 6

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3_X - halogen-free, RoHS-compliant, and

AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,.....)

Terminals: matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	V15K170C	UNIT			
Device marking code		V1517C				
Maximum repetitive peak reverse voltage	V_{RRM}	170	V			
Maximum DC forward current per device	I _{F(AV)} (1)	15	Α			
	I _{F(AV)} (2)	3	А			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I _{FSM}	130	А			
Operating junction temperature range	T _J ⁽³⁾	-40 to +150	°C			
Storage temperature range	T _{STG}	-55 to +150	°C			

Notes

- (1) With infinite heatsink
- (2) Free air, mounted on recommended pad area
- $^{(3)}$ The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$



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ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I _F = 5 A	T _J = 25 °C	V _F ⁽¹⁾	0.77	ı	V
	I _F = 7.5 A			0.81	0.9	
	I _F = 5 A	T _J = 125 °C		0.62	-	
	I _F = 7.5 A			0.66	0.75	
Reverse current per diode	V _R = 140 V	T _J = 25 °C		0.0003	-	
	V _R = 140 V	T _J = 125 °C	I _R ⁽²⁾	0.5	-	mA
	V _R = 170 V	T _J = 25 °C		ı	0.05	
		T _J = 125 °C		0.8	4	
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	460	-	pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	TYP.	MAX.	UNIT		
Thermal resistance per device	R ₀ JA (1)(2)	75	-	°C/W		
	R _{0JM} (3)	2.5	3.5			

Notes

- $^{(1)}$ The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
- $^{(2)}$ Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ junction-to-ambient
- $^{(3)}$ Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ junction-to-mount

ORDERING INFORMATION (Example)							
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE			
V15K170C-M3/H	0.10	Н	1500	7" diameter plastic tape and reel			
V15K170C-M3/I	0.10	I	6000	13" diameter plastic tape and reel			
V15K170CHM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel			
V15K170CHM3_A/I (1)	0.10	I	6000	13" diameter plastic tape and reel			

Note

(1) AEC-Q101 qualified



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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

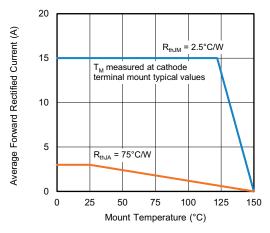


Fig. 1 - Maximum Forward Current Derating Curve

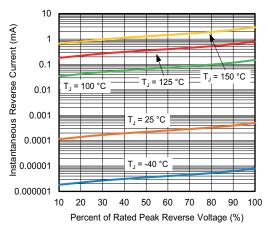


Fig. 4 - Typical Reverse Leakage Characteristics

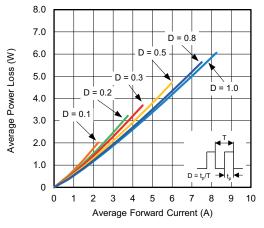


Fig. 2 - Forward Power Loss Characteristics

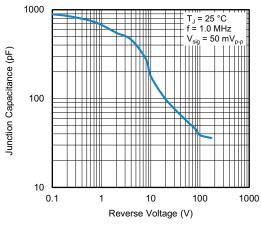


Fig. 5 - Typical Junction Capacitance

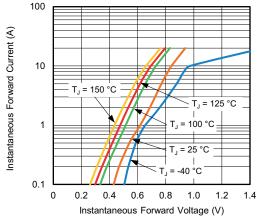


Fig. 3 - Typical Instantaneous Forward Characteristics

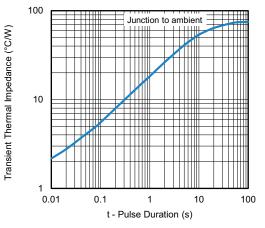


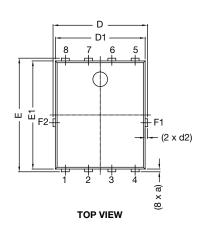
Fig. 6 - Typical Transient Thermal Impedance

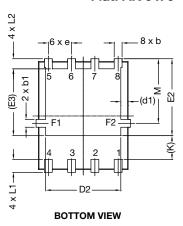


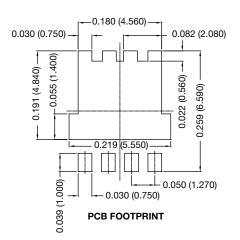
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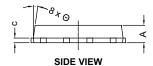
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

FlatPAK 5 x 6









DIM	INCHES			MILLIMETERS	ERS	
DIM.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
Α	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
С	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
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
Е	0.238	0.244	0.250	6.05	6.20	6.35
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	-
е		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
М	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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