

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

 Ultra Low $V_F = 0.36\text{ V}$ at $I_F = 5\text{ A}$

FlatPAK 5 x 6

 1, 2, 3, 4 \rightarrow \leftarrow 5, 6, 7, 8

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
- AEC-Q101 qualified available
- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	20 A
V_{RRM}	60 V
I_{FSM}	220 A
V_F at $I_F = 20\text{ A}$ ($T_J = 125\text{ °C}$)	0.52 V
T_J max.	165 °C
Package	FlatPAK 5 x 6
Circuit configuration	Single

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 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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 ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V20KM60	UNIT
Device marking code		20M60	
Maximum repetitive peak reverse voltage	V_{RRM}	60	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	20	A
	$I_{F(AV)}^{(2)}$	4.7	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	220	
Operating junction temperature range	$T_J^{(3)}$	-40 to +165	°C
Storage temperature range	T_{STG}	-55 to +165	

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: $dP_D/dT_J < 1/R_{\theta JA}$



ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 5 A	T _J = 25 °C	V _F ⁽¹⁾	0.47	-	V
	I _F = 10 A			0.51	-	
	I _F = 20 A			0.58	0.65	
	I _F = 5 A	T _J = 125 °C		0.36	-	
	I _F = 10 A			0.42	-	
	I _F = 20 A			0.52	0.57	
Reverse current	V _R = 60 V	T _J = 25 °C	I _R ⁽²⁾	-	0.4	mA
		T _J = 125 °C		6	20	
Typical junction capacitance	4.0 V, 1 MHz		C _J	2860	-	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	R _{θJA} ⁽¹⁾⁽²⁾	75	-	°C/W
	R _{θJM} ⁽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_{θJA}
(2) Free air, mounted on recommended copper pad area; thermal resistance R_{θJA} - junction-to-ambient
(3) Mounted on infinite heatsink; thermal resistance R_{θJM} - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V20KM60-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V20KM60-M3/I	0.10	I	6000	13" diameter plastic tape and reel
V20KM60HM3/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V20KM60HM3/I ⁽¹⁾	0.10	I	6000	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

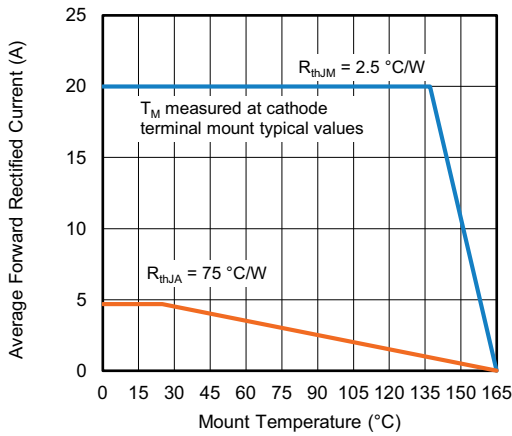


Fig. 1 - Maximum Forward Current Derating Curve

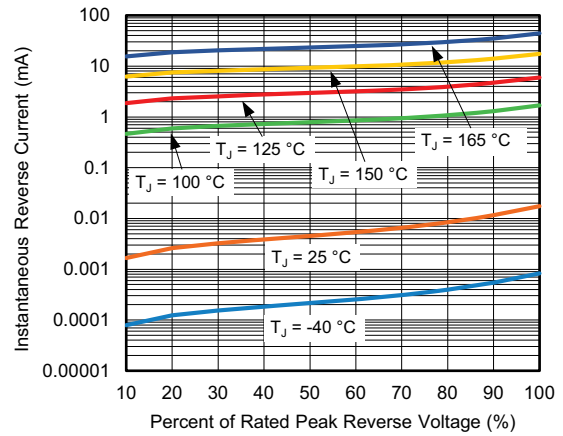


Fig. 4 - Typical Reverse Leakage Characteristics

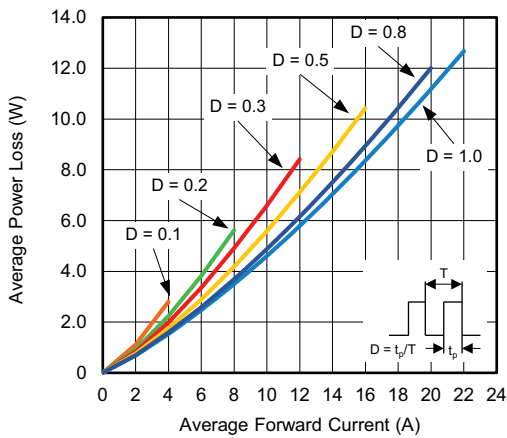


Fig. 2 - Forward Power Loss Characteristics

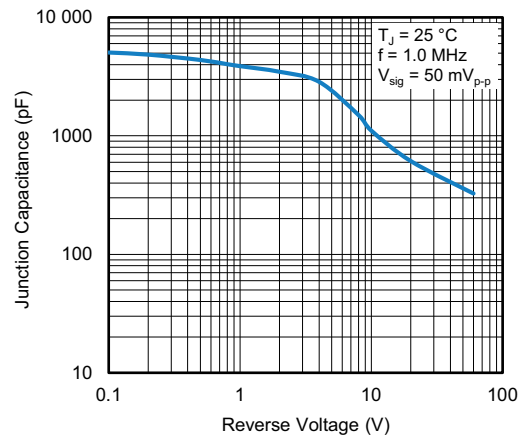


Fig. 5 - Typical Junction Capacitance

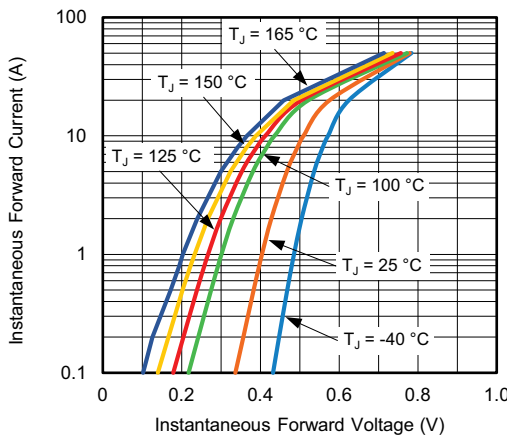


Fig. 3 - Typical Instantaneous Forward Characteristics

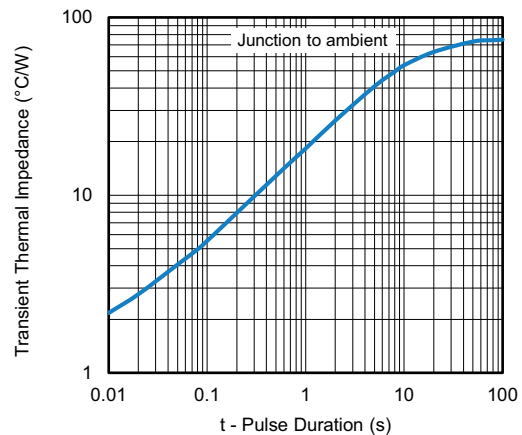
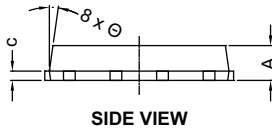
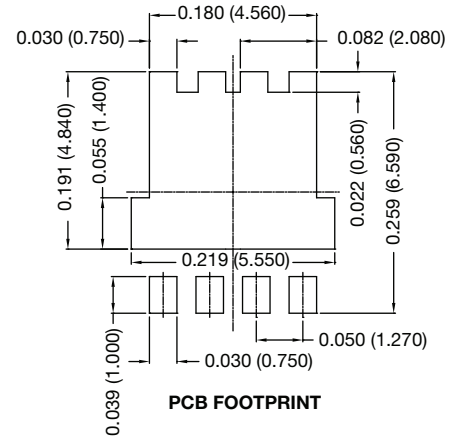
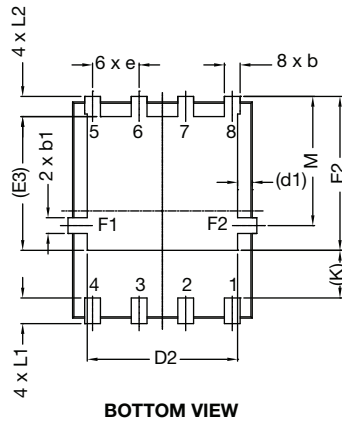
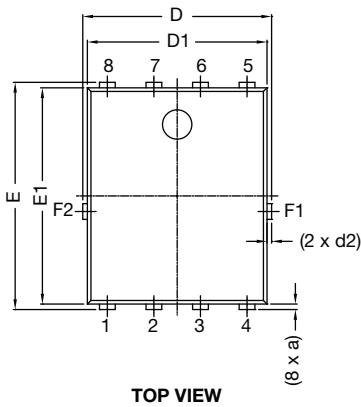


Fig. 6 - Typical Transient Thermal Impedance

DIMENSIONS in inches (millimeters)

FlatPAK 5 x 6


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
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
E	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	-
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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