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



DFN3820A

FEATURES

AUTOMOTIVE GRADE Available

- Low profile package - typical height of 0.88 mm
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C

Pb RoHS COMPLIANT HALOGEN FREE

- AEC-Q101 qualified available
  - Automotive ordering code; base P/NHM3
- Compatible to SMP (DO-220AA) package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

LINKS TO ADDITIONAL RESOURCES

Ultra Librarian EDA / CAD

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DFN3820A
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
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 meet JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5 A
V_{RRM}	100 V
I_{FSM}	100 A
V_F at I_F = 2.5 A (T_J = 125 °C)	0.49 V
T_J max.	175 °C
Package	DFN3820A
Circuit configuration	Single

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V5NM103	UNIT
Device marking code		5MG	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ (1)	5	A
	$I_{F(AV)}$ (2)	2.1	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100	A
Operating junction temperature range	T_J (3)	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Notes

(1) With infinite heatsink
(2) Free air, mounted on FR4 PCB, 2 oz., standard footprint
(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	I_F = 2.5 A	T_J = 25 °C	V_F (1)	0.56	-	V
	I_F = 5 A			0.67	0.72	
	I_F = 2.5 A	T_J = 125 °C		0.49	-	
	I_F = 5 A			0.58	0.63	
Reverse current	V_R = 70 V	T_J = 25 °C	I_R (2)	0.0012	-	mA
		T_J = 125 °C		0.9	-	
	V_R = 100 V	T_J = 25 °C		-	0.14	
		T_J = 125 °C		2	6	
Typical junction capacitance	4.0 V, 1 MHz		C_J	580	-	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 specified)				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance	$R_{\theta JA}$ (1)(2)	135	169	°C/W
	$R_{\theta JM}$ (3)	5	6.3	

Notes

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

(3) Thermal resistance junction-to-mount to follow JEDEC 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V5NM103-M3/H	0.023	H	3500	7" diameter plastic tape and reel
V5NM103-M3/I	0.023	I	14 000	13" diameter plastic tape and reel
V5NM103HM3/H (1)	0.023	H	3500	7" diameter plastic tape and reel
V5NM103HM3/I (1)	0.023	I	14 000	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)

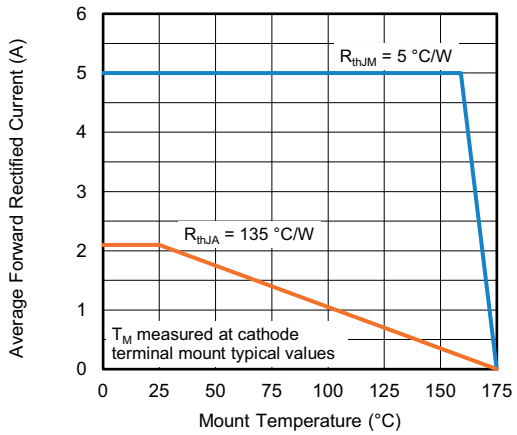


Fig. 1 - Maximum Forward Current Derating Curve

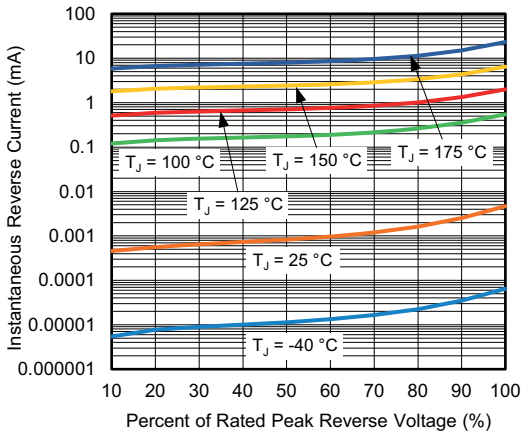


Fig. 4 - Typical Reverse Characteristics

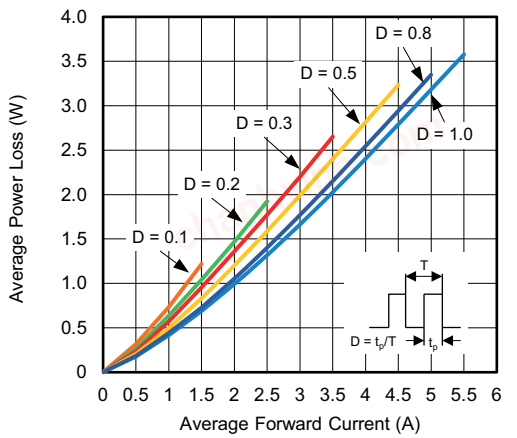


Fig. 2 - Forward Power Loss Characteristics

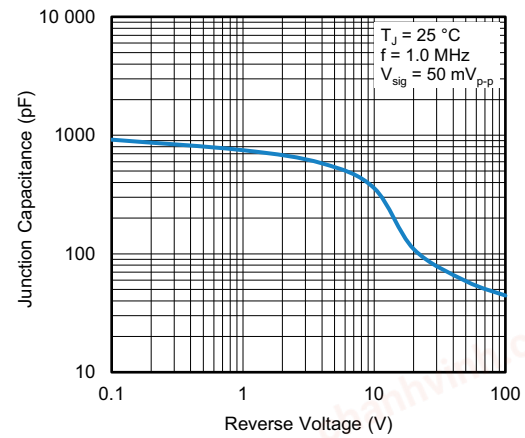


Fig. 5 - Typical Junction Capacitance

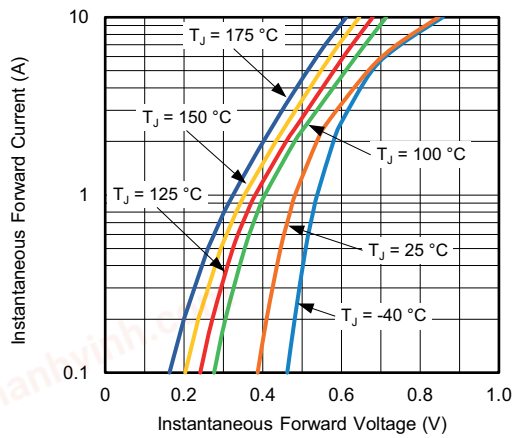


Fig. 3 - Typical Instantaneous Forward Characteristics

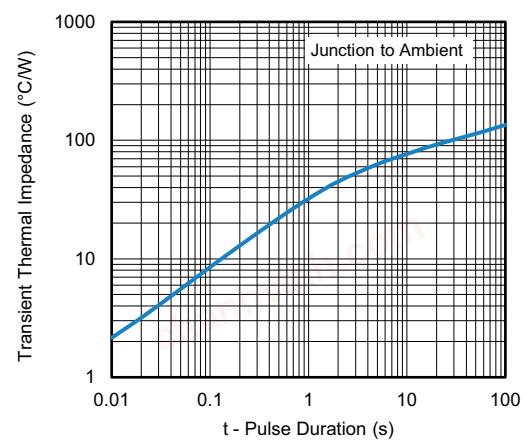


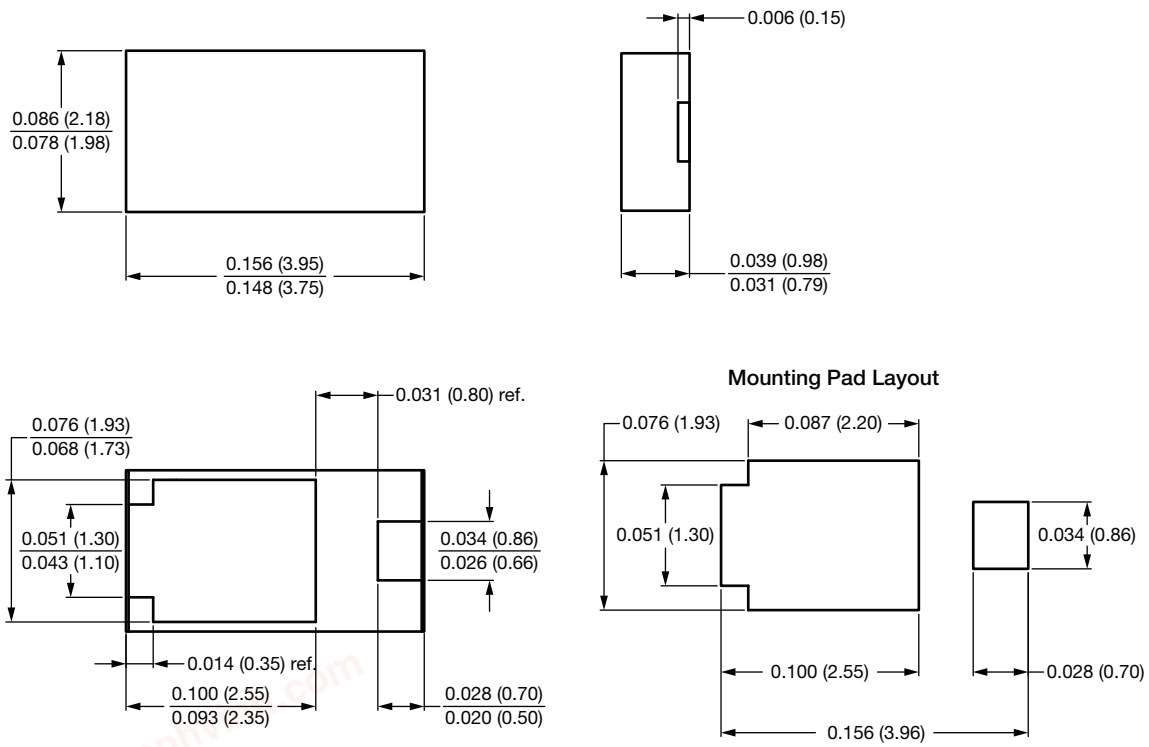
Fig. 6 - Typical Transient Thermal Impedance

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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