

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



LINKS TO ADDITIONAL RESOURCES



RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Low profile package - typical height of 0.88 mm
- Leadless DFN package with side-wettable flanks suitable for customer AOI (Automatic Optical Inspection)
- 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
- 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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V
I_{FSM}	50 A
V_F at $I_F = 1.0$ A ($T_J = 125$ °C)	0.45 V
T_J max.	150 °C
Package	DFN3820A
Circuit configuration	Single

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

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V2N103	UNIT
Device marking code		V2G	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	2	A
	$I_{F(AV)}^{(2)}$	1.6	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50	A
Operating junction temperature range	T_J ⁽³⁾	-40 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Notes

(1) Mounted on 10 mm x 10 mm copper pad area PCB

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

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 1.0 \text{ A}$	$T_J = 25^\circ\text{C}$	V_F ⁽¹⁾	0.51	-	V	
	$I_F = 2.0 \text{ A}$			0.61	0.67		
	$I_F = 1.0 \text{ A}$	$T_J = 125^\circ\text{C}$		0.45	-		
	$I_F = 2.0 \text{ A}$			0.56	0.60		
Reverse current	$V_R = 70 \text{ V}$	$T_J = 25^\circ\text{C}$	I_R ⁽²⁾	0.002	-	mA	
		$T_J = 125^\circ\text{C}$		1.0	-		
	$V_R = 100 \text{ V}$	$T_J = 25^\circ\text{C}$		-	0.15		
		$T_J = 125^\circ\text{C}$		2.5	8.0		
Typical junction capacitance	4.0 V, 1 MHz		C_J	260	-	pF	

Notes

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

(2) Pulse test: pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)					
PARAMETER		SYMBOL	TYP.	MAX.	UNIT
Thermal resistance		$R_{\theta JA}$ ⁽¹⁾⁽²⁾	140	175	°C/W
		$R_{\theta JM}$ ⁽³⁾	6	7.5	

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 TABLE

Device code	V	2	N	10	3	H	M3
	1	2	3	4	5	6	7
1	-	Vishay TMBS product					
2	-	Current rating (2 = 2 A)					
3	-	Package type (N = DFN3820A)					
4	-	Voltage rating (10 = 100 V)					
5	-	TMBS generation option (3 = Gen3)					
6	-	Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)					
7	-	Material / Environment category (M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)					

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V2N103-M3/H	0.023	H	3500	7" diameter plastic tape and reel
V2N103-M3/I	0.023	I	14 000	13" diameter plastic tape and reel
V2N103HM3/H ⁽¹⁾	0.023	H	3500	7" diameter plastic tape and reel
V2N103HM3/I ⁽¹⁾	0.023	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

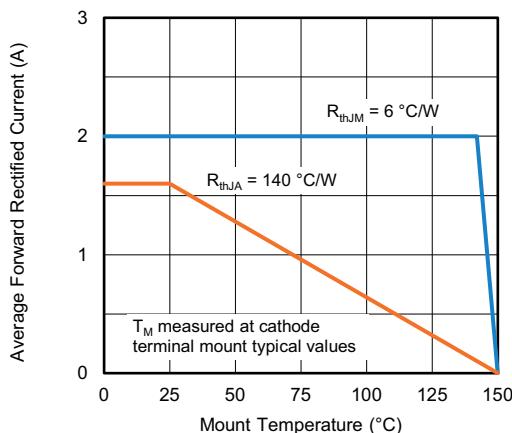
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

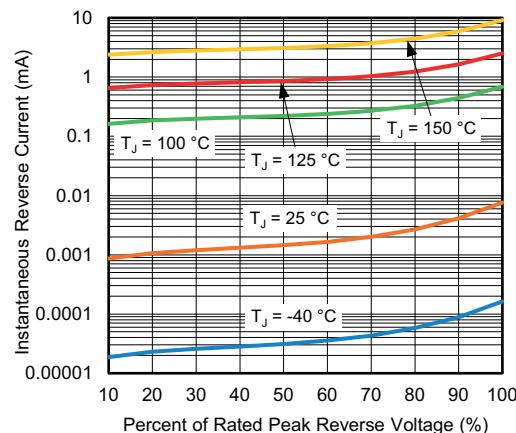


Fig. 4 - Typical Reverse Characteristics

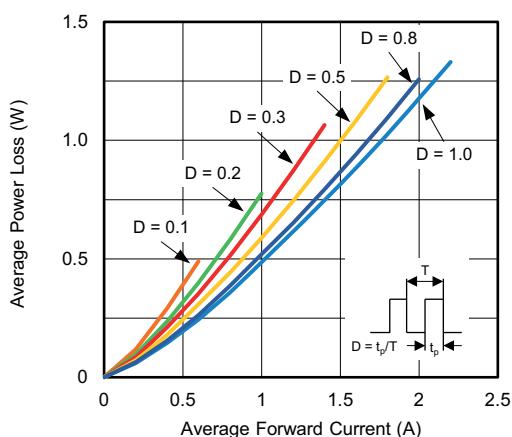


Fig. 2 - Forward Power Loss Characteristics

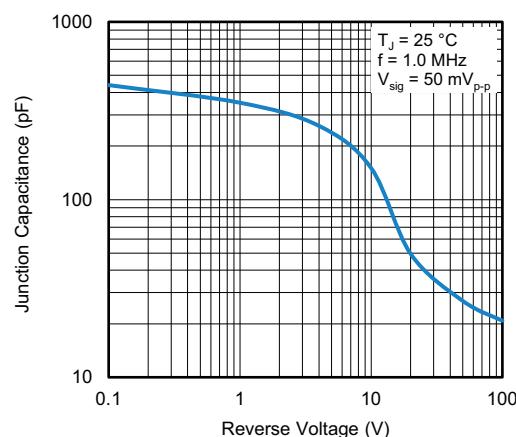


Fig. 5 - Typical Junction Capacitance

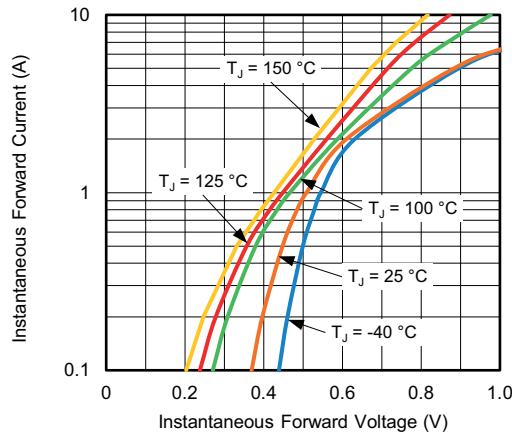


Fig. 3 - Typical Instantaneous Forward Characteristics

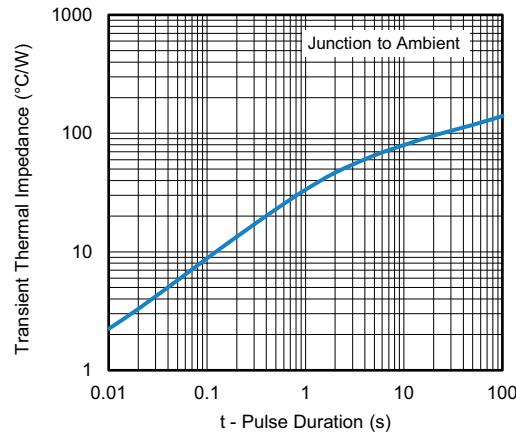
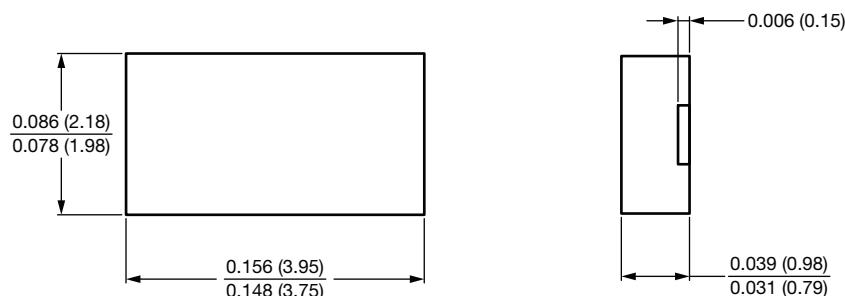
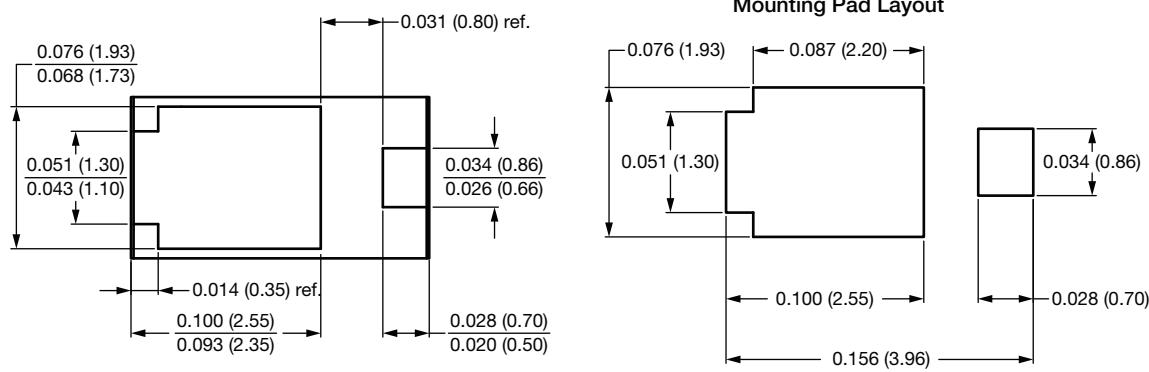


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN3820A

Mounting Pad Layout


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