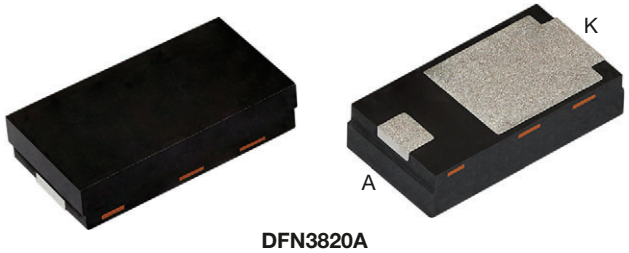
Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



DFN3820A

Anode ○—▶|—○ Cathode

LINKS TO ADDITIONAL RESOURCES

Ultra Librarian EDA / CAD | Related Documents | Packages | Marking | Application Notes

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3 A
V_{RRM}	100 V
I_{FSM}	80 A
V_F at I_F = 1.5 A (T_J = 125 °C)	0.46 V
T_J max.	175 °C
Package	DFN3820A
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

- 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

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	V3NM103	UNIT
Device marking code		3MG	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ (1)	3	A
	$I_{F(AV)}$ (2)	2	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80	A
Operating junction temperature range	T_J (3)	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°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: $dP_D/dT_J < 1/R_{\theta JA}$

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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 = 1.5 A	T_J = 25 °C	V_F (1)	0.54	-	V
	I_F = 3.0 A			0.63	0.69	
	I_F = 1.5 A	T_J = 125 °C		0.46	-	
	I_F = 3.0 A			0.55	0.62	
Reverse current	V_R = 70 V	T_J = 25 °C	I_R (2)	0.001	-	mA
		T_J = 125 °C		0.7	-	
	V_R = 100 V	T_J = 25 °C		-	0.12	
		T_J = 125 °C		1.5	4.0	
Typical junction capacitance	4.0 V, 1 MHz		C_J	440	-	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 TABLE

Device code

V	3	N	M	10	3	H	M3
1	2	3	4	5	6	7	8

1 - Vishay TMBS product

2 - Current rating (3 = 3 A)

3 - Package type (N = DFN3820A)

4 - Process type option (M = low I_R)

5 - Voltage rating (10 = 100 V)

6 - TMBS generation option (3 = Gen3)

7 - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)

8 - 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**
V3NM103-M3/H	0.023	H	3500	7" diameter plastic tape and reel
V3NM103-M3/I	0.023	I	14 000	13" diameter plastic tape and reel
V3NM103HM3/H (1)	0.023	H	3500	7" diameter plastic tape and reel
V3NM103HM3/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)

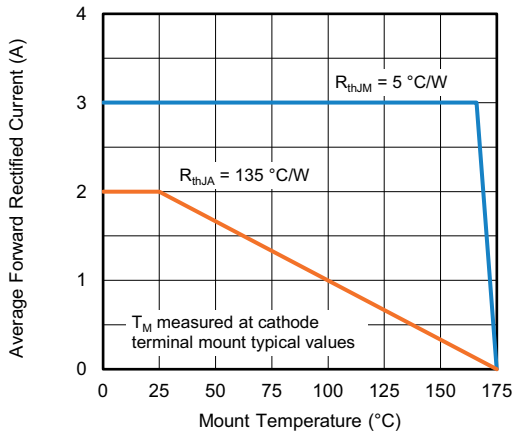


Fig. 1 - Maximum Forward Current Derating Curve

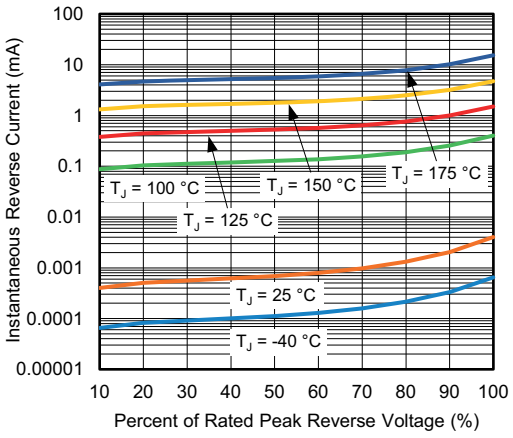


Fig. 4 - Typical Reverse Characteristics

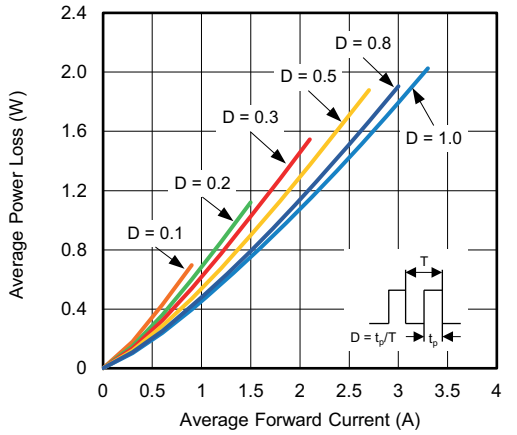


Fig. 2 - Forward Power Loss Characteristics

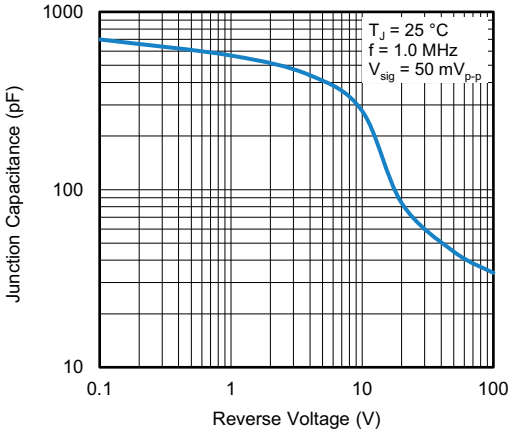


Fig. 5 - Typical Junction Capacitance

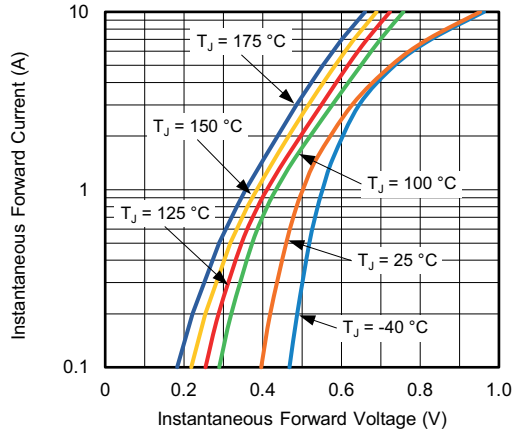


Fig. 3 - Typical Instantaneous Forward Characteristics

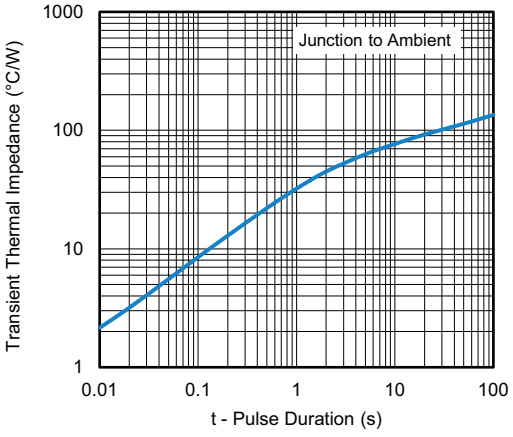
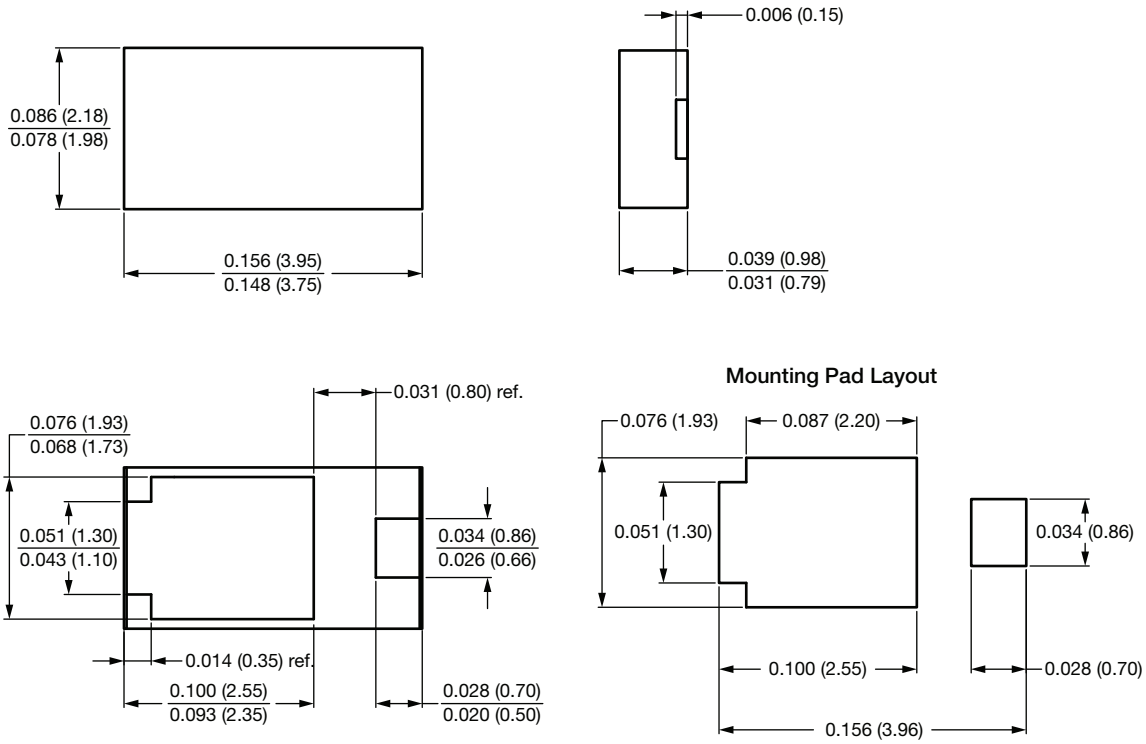


Fig. 6 - Typical Transient Thermal Impedance

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN3820A



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