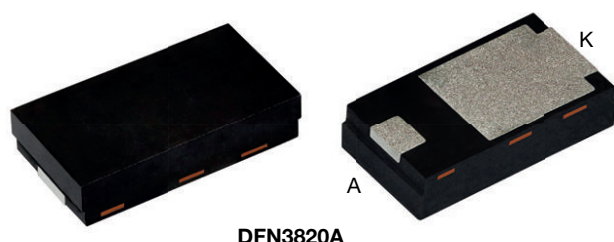


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier


**DFN3820A**

Anode Cathode

## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
$V_{RRM}$	200 V
$I_{FSM}$	50 A
$V_F$ at $I_F = 1.0$ A ( $T_J = 125$ °C)	0.60 V
$T_J$ max.	175 °C
Package	DFN3820A
Circuit configuration	Single

## 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](http://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	V2N22	UNIT
Device marking code		V2D	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	2	A
	$I_{F(AV)}^{(2)}$	1.5	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50	A
Operating junction and storage temperature range	$T_J^{(3)}$	-40 to +175	°C
Operating junction and 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:  $dP_D/dT_J < 1/R_{\theta JA}$

**ELECTRICAL CHARACTERISTICS** ( $T_J = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 1.0\text{ A}$	$V_F^{(1)}$	0.74	-	V
	$I_F = 2.0\text{ A}$		0.80	0.85	
	$I_F = 1.0\text{ A}$		0.60	-	
	$I_F = 2.0\text{ A}$		0.66	0.72	
Reverse current	$V_R = 160\text{ V}$	$I_R^{(2)}$	0.00015	-	mA
	$T_J = 25\text{ }^{\circ}\text{C}$		0.14	-	
	$T_J = 125\text{ }^{\circ}\text{C}$		-	0.04	
	$V_R = 200\text{ V}$		0.3	1.0	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	110	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: pulse width  $\leq 5\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance	$R_{\theta JA}^{(1)(2)}$	140	175	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	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

<b>V</b>	<b>2</b>	<b>N</b>	<b>2</b>	<b>2</b>	<b>H</b>	<b>M3</b>
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 (2 = 200 V)
- 5** - TMBS generation option (2 = gen 2)
- 6** - Quality grade (H = AEC-Q101 qualified, - = industry grade)
- 7** - Material / Environmental 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
V2N22-M3/H	0.023	H	3500	7" diameter plastic tape and reel
V2N22-M3/I	0.023	I	14 000	13" diameter plastic tape and reel
V2N22HM3/H <sup>(1)</sup>	0.023	H	3500	7" diameter plastic tape and reel
V2N22HM3/I <sup>(1)</sup>	0.023	I	14 000	13" diameter plastic tape and reel

**Note**<sup>(1)</sup> AEC-Q101 qualified

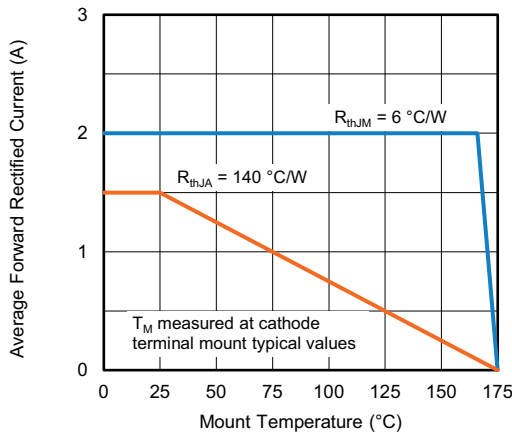
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

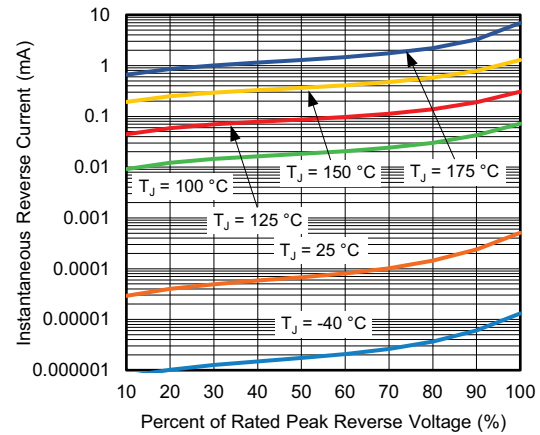


Fig. 4 - Typical Reverse Characteristics

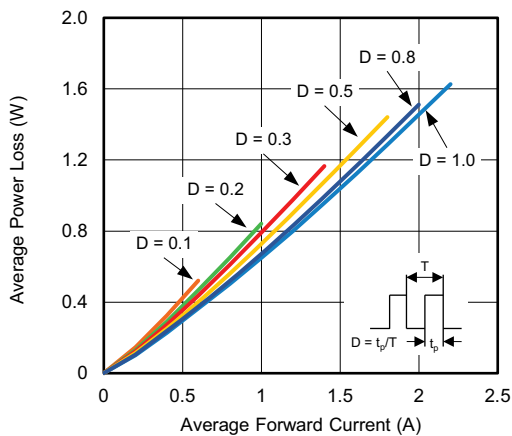


Fig. 2 - Forward Power Loss Characteristics

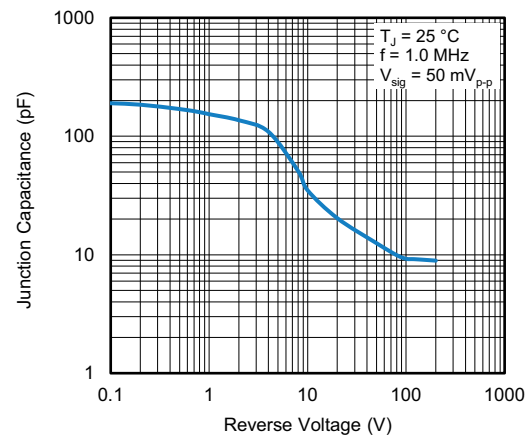


Fig. 5 - Typical Junction Capacitance

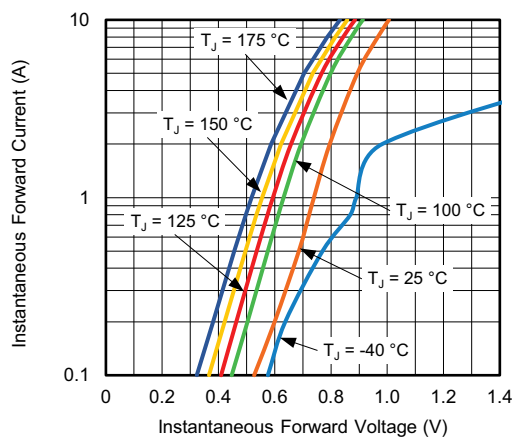


Fig. 3 - Typical Instantaneous Forward Characteristics

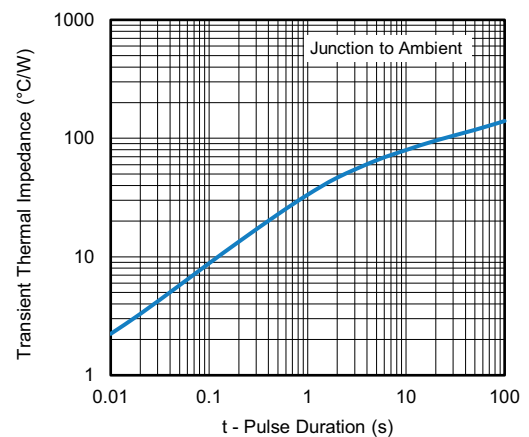
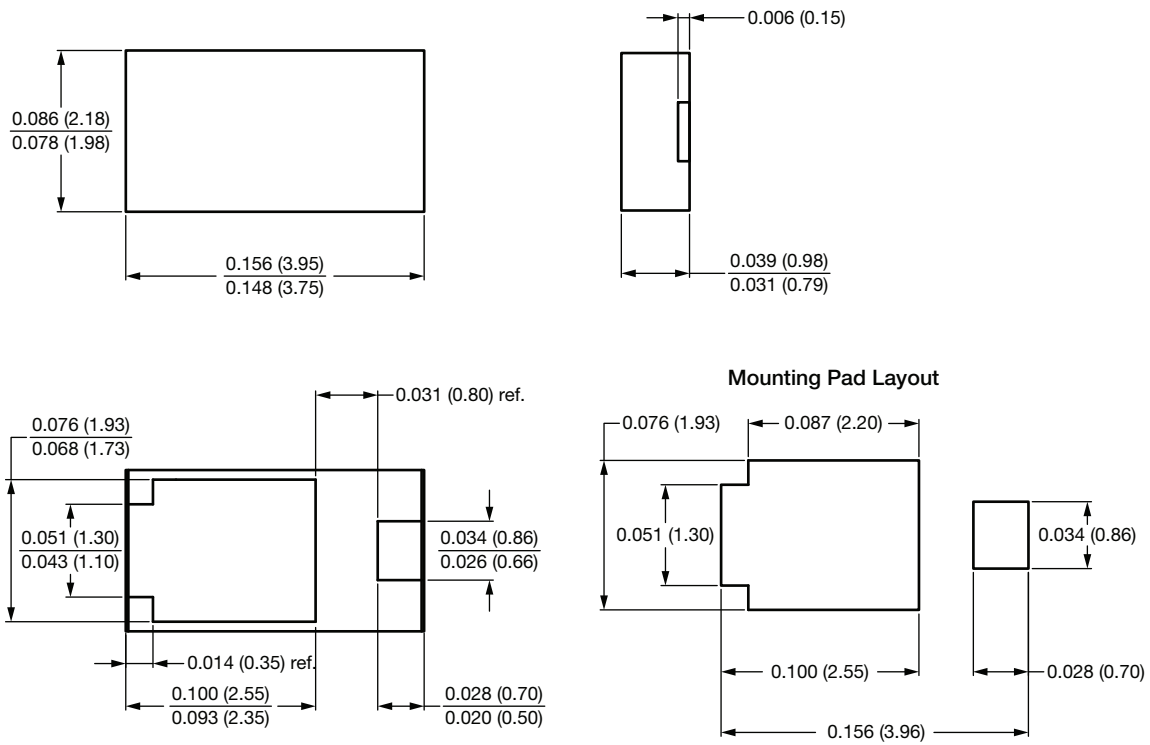


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DFN3820A**




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