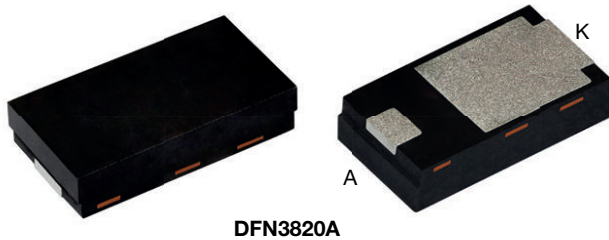


# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier



DFN3820A

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                  |          |
|--|----------|
| $I_{F(AV)}$                              | 5 A      |
| $V_{RRM}$                                | 60 V     |
| $I_{FSM}$                                | 100 A    |
| $V_F$ at $I_F = 2.5$ A ( $T_J = 125$ °C) | 0.35 V   |
| $T_J$ max.                               | 150 °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            | V5NL63      | UNIT |
| Device marking code  |                   | 5LF         |      |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$         | 60          | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}^{(1)}$ | 5           | A    |
|  | $I_{F(AV)}^{(2)}$ | 2.4         | 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 +150 | °C   |
| Storage temperature range  | $T_{STG}$         | -55 to +150 | °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 <sub>J</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|--|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage  | I <sub>F</sub> = 2.5 A | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.44 | -    | V    |
|  | I <sub>F</sub> = 5 A   |                         |                               | 0.51 | 0.58 |      |
|  | I <sub>F</sub> = 2.5 A | T <sub>J</sub> = 125 °C |                               | 0.35 | -    |      |
|  | I <sub>F</sub> = 5 A   |                         |                               | 0.46 | 0.52 |      |
| Reverse current  | V <sub>R</sub> = 60 V  | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 0.08 | mA   |
|  |                        | T <sub>J</sub> = 125 °C |                               | 4    | 9    |      |
| Typical junction capacitance   | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 840  | -    | pF   |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified) |                                    |      |      |      |
|---|------------------------------------|------|------|------|
| PARAMETER   | SYMBOL                             | TYP. | MAX. | UNIT |
| Thermal resistance  | R <sub>θJA</sub> <sup>(1)(2)</sup> | 135  | 169  | °C/W |
|   | R <sub>θJM</sub> <sup>(3)</sup>    | 5    | 6.3  |      |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP<sub>D</sub>/dT<sub>J</sub> < 1/R<sub>θJA</sub>
- (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 | 5 | N | L | 6 | 3 | H | M3 |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧  |

- 1** - Vishay TMBS product
- 2** - Current rating (5 = 5 A)
- 3** - Package type (N = DFN3820A)
- 4** - Process type option (L = low V<sub>F</sub>)
- 5** - Voltage rating (6 = 60 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                      |
| V5NL63-M3/H                    | 0.023           | H                      | 3500          | 7" diameter plastic tape and reel  |
| V5NL63-M3/I                    | 0.023           | I                      | 14 000        | 13" diameter plastic tape and reel |
| V5NL63HM3/H <sup>(1)</sup>     | 0.023           | H                      | 3500          | 7" diameter plastic tape and reel  |
| V5NL63HM3/I <sup>(1)</sup>     | 0.023           | I                      | 14 000        | 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)

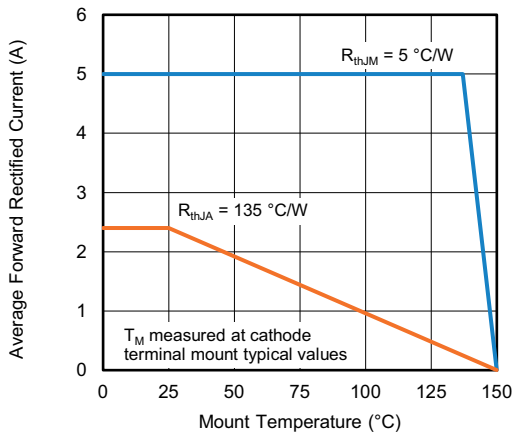


Fig. 1 - Maximum Forward Current Derating Curve

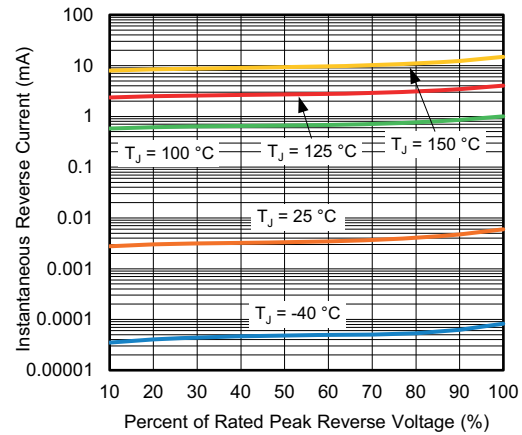


Fig. 4 - Typical Reverse Characteristics

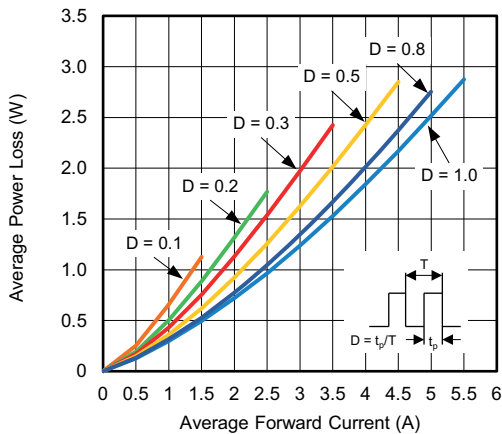


Fig. 2 - Forward Power Loss Characteristics

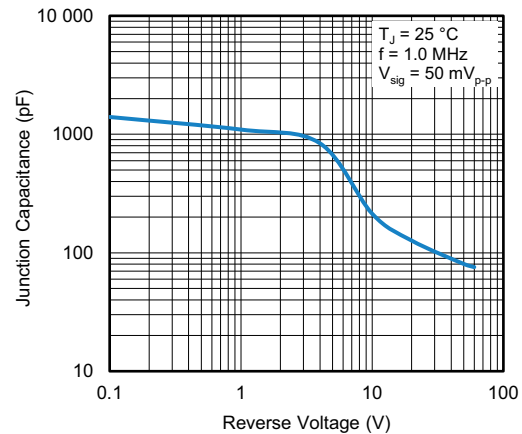


Fig. 5 - Typical Junction Capacitance

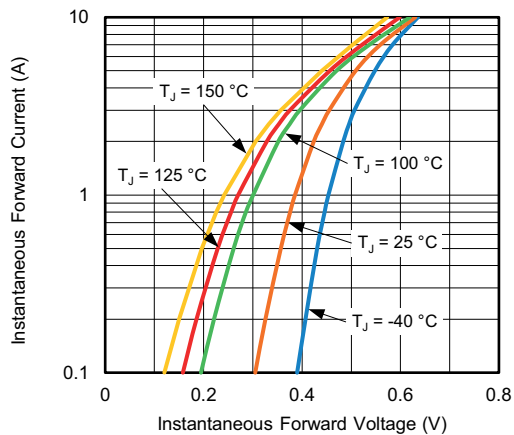


Fig. 3 - Typical Instantaneous Forward Characteristics

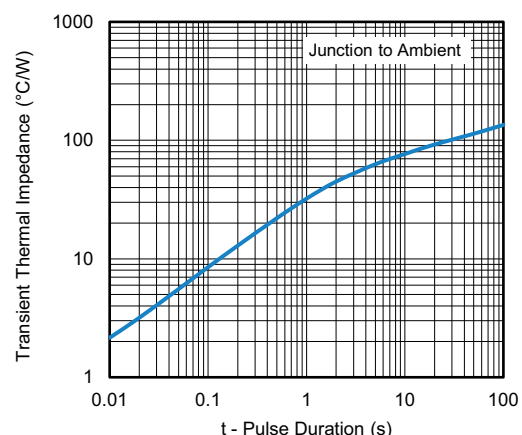
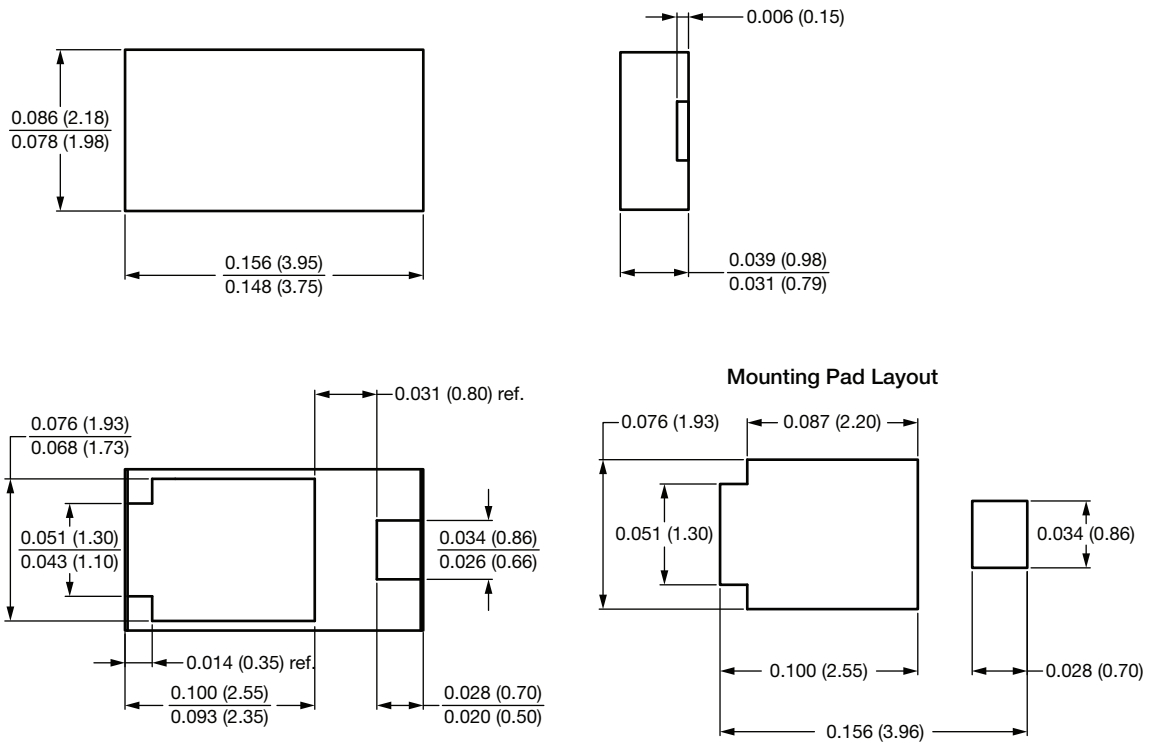


Fig. 6 - Typical Transient Thermal Impedance



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

**DFN3820A**





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