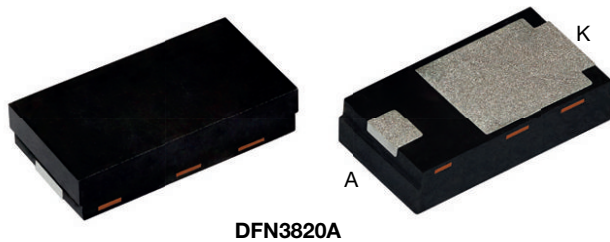


# High Current Density Surface-Mount Schottky Barrier Rectifier


**DFN3820A**

Anode Cathode

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                  |          |
|--|----------|
| $I_{F(AV)}$                              | 1.0 A    |
| $V_{RRM}$                                | 40 V     |
| $I_{FSM}$                                | 30 A     |
| $V_F$ at $I_F = 0.5$ A ( $T_J = 125$ °C) | 0.34 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)
- Guardring for overvoltage protection
- 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)

 AUTOMOTIVE  
GRADE  
Available

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## 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            | SS1N42      | UNIT |
| Device marking code  |                   | S14         |      |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$         | 40          | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}^{(1)}$ | 1           | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 30          | A    |
| Operating junction temperature range   | $T_J^{(2)}$       | -40 to +150 | °C   |
| Storage temperature range  | $T_{STG}$         | -55 to +150 | °C   |

### Notes

(1) Free air, mounted on FR4 PCB, 2 oz., standard footprint

(2) 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> = 0.5 A | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.43 | -    | V    |
|  | I <sub>F</sub> = 1.0 A |                         |                               | 0.49 | 0.54 |      |
|  | I <sub>F</sub> = 0.5 A | T <sub>J</sub> = 125 °C |                               | 0.34 | -    |      |
|  | I <sub>F</sub> = 1.0 A |                         |                               | 0.43 | 0.49 |      |
| Reverse current  | V <sub>R</sub> = 40 V  | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 0.05 | mA   |
|  |                        | T <sub>J</sub> = 125 °C |                               | 2    | 4    |      |
| Typical junction capacitance   | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 45   | -    | 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> | 150  | 188  | °C/W |
|   | R <sub>θJM</sub> <sup>(3)</sup>    | 7.5  | 9.4  |      |

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

|           |          |          |          |          |          |           |
|-----------|----------|----------|----------|----------|----------|-----------|
| <b>SS</b> | <b>1</b> | <b>N</b> | <b>4</b> | <b>2</b> | <b>H</b> | <b>M3</b> |
|-----------|----------|----------|----------|----------|----------|-----------|

①      ②      ③      ④      ⑤      ⑥      ⑦

- 1** - Vishay planar Schottky product
- 2** - Current rating (1 = 1 A)
- 3** - Package type (N = DFN3820A)
- 4** - Voltage rating (4 = 40 V)
- 5** - Planar Schottky generation option (2 = Gen 2)
- 6** - Quality grade (H = AEC-Q101 qualified, otherwise = 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                      |
| SS1N42-M3/H                    | 0.023           | H                      | 3500          | 7" diameter plastic tape and reel  |
| SS1N42-M3/I                    | 0.023           | I                      | 14 000        | 13" diameter plastic tape and reel |
| SS1N42HM3/H <sup>(1)</sup>     | 0.023           | H                      | 3500          | 7" diameter plastic tape and reel  |
| SS1N42HM3/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)

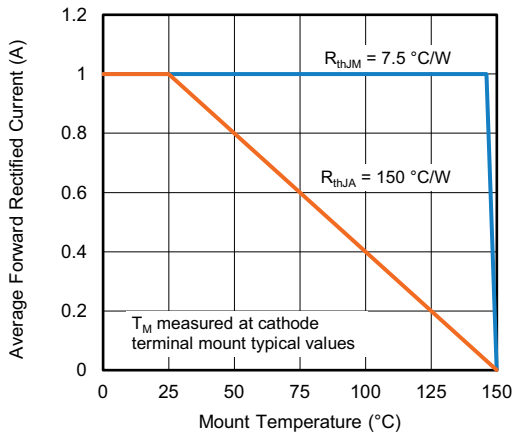


Fig. 1 - Maximum Forward Current Derating Curve

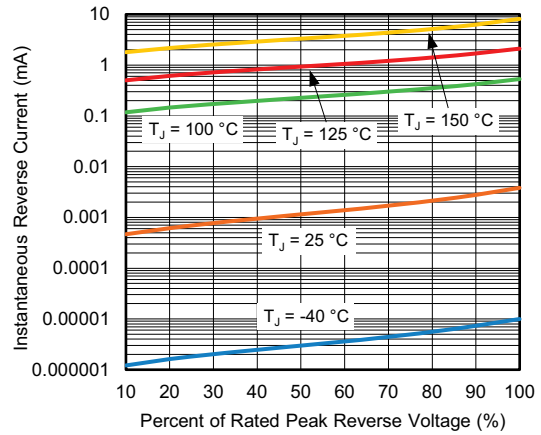


Fig. 4 - Typical Reverse Characteristics

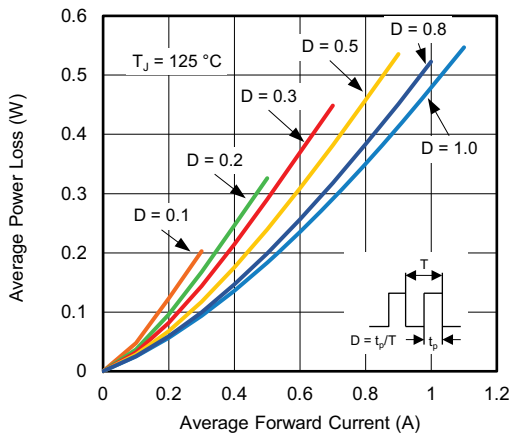


Fig. 2 - Forward Power Loss Characteristics

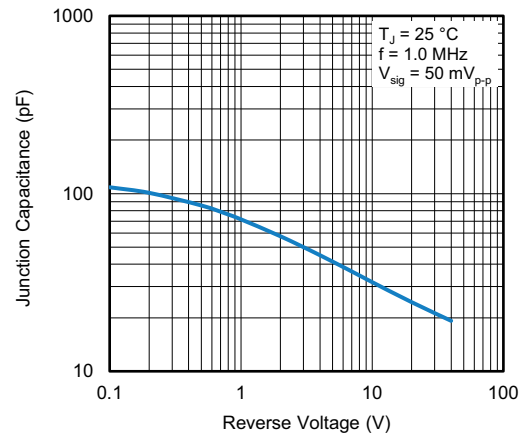


Fig. 5 - Typical Junction Capacitance

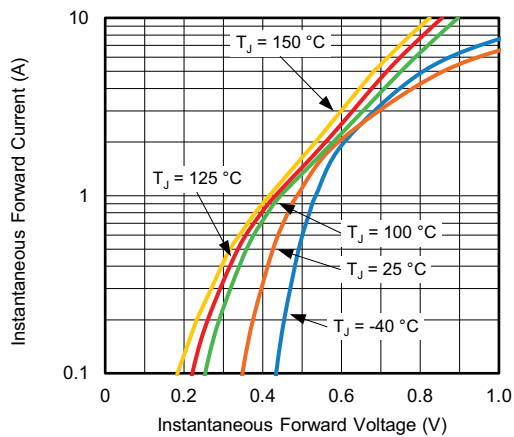


Fig. 3 - Typical Instantaneous Forward Characteristics

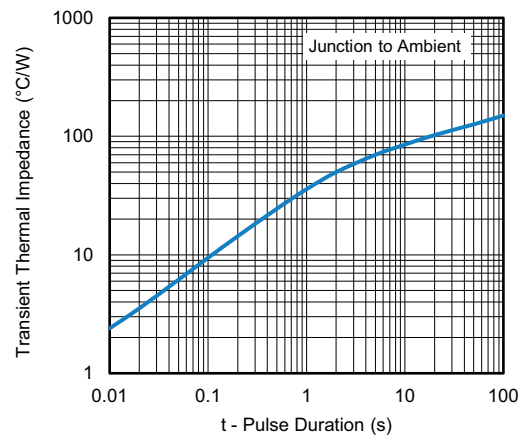


Fig. 6 - Typical Transient Thermal Impedance





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