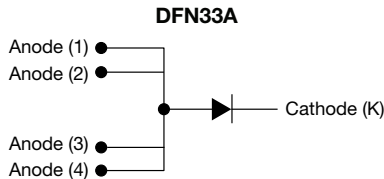
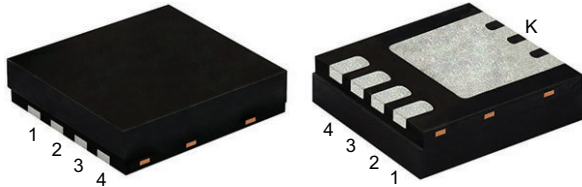


Surface-Mount Standard Rectifier



LINKS TO ADDITIONAL RESOURCES



SPICE

[Models](#)

| PRIMARY CHARACTERISTICS | |
|--|---------------------|
| $I_{F(AV)}$ | 6 A |
| V_{RRM} | 200 V, 400 V, 600 V |
| I_{FSM} | 80 A |
| V_F at $I_F = 6$ A ($T_J = 125$ °C) | 0.88 V |
| T_J max. | 175 °C |
| Package | DFN33A |
| 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)
- Ideal for automated replacement
- Oxide planar chip junction
- Low forward voltage drop
- Typical IR less than 0.1 μ A
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

General purpose, power line polarity protection and rail-to-rail protection in consumer, industrial, and automotive applications.

MECHANICAL DATA

Case: DFN33A

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

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

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | |
|---|-------------------|-------------|---------|---------|------|
| PARAMETER | SYMBOL | SE60N3D | SE60N3G | SE60N3J | UNIT |
| Device marking code | | 6D | 6G | 6J | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | 400 | 600 | V |
| Maximum average forward rectified current (fig.1) | $I_{F(AV)}^{(1)}$ | 6 | | | A |
| | $I_{F(AV)}^{(2)}$ | 1.88 | | | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 80 | | | A |
| Operating junction temperature range | $T_J^{(3)}$ | -55 to +175 | | | °C |
| Storage temperature range | T_{STG} | -55 to +175 | | | |

Notes

(1) With infinite heatsink

(2) Free air, mounted on recommended copper pad area

(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 °C unless otherwise noted) | | | | | | |
|--|----------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 3 A | T _J = 25 °C | V _F ⁽¹⁾ | 0.91 | - | V |
| | I _F = 6 A | | | 0.98 | 1.05 | |
| | I _F = 3 A | T _J = 125 °C | | 0.80 | - | |
| | I _F = 6 A | | | 0.88 | 0.98 | |
| Reverse current | Rated V _R | T _J = 25 °C | I _R ⁽²⁾ | - | 10 | μA |
| | | T _J = 125 °C | | 18 | 100 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 40 | - | 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 _{θJA} ⁽¹⁾⁽²⁾ | 122 | 153 | °C/W |
| | R _{θJM} ⁽³⁾ | 2.9 | 3.6 | |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP_D/dT_J < 1/R_{θJA}
- (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)

| IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T _A = 25 °C unless otherwise noted) | | | | | |
|---|--|------------------------|----------------|-------|----------|
| STANDARD | TEST TYPE | TEST CONDITIONS | SYMBOL | CLASS | VALUE |
| AEC-Q101-001 | Human body model (contact mode) | C = 100 pF, R = 1.5 kΩ | V _C | H3B | > 8 kV |
| AEC-Q101-005 | Charge device mode | Refer to AEC-Q101-005 | | C3 | > 1000 V |
| JESD22-A114 | Human body model (contact mode) | C = 100 pF, R = 1.5 kΩ | | 3B | > 8 kV |
| IEC 61000-4-2 ⁽²⁾ | Human body model (contact mode) | C = 150 pF, R = 330 Ω | | 4 | > 8 kV |
| | Human body model (air-discharge mode) ⁽¹⁾ | C = 150 pF, R = 330 Ω | | 4 | > 15 kV |

Notes

- (1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV
- (2) System ESD standard

ORDERING INFORMATION TABLE

| | | | | | | | |
|-------------|----------|----------|---|-----------|----------|----------|-----------|
| Device code | S | E | 60 | N3 | J | H | M3 |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| | 1 | - | Vishay standard recovery product | | | | |
| | 2 | - | Oxide planar chip technology | | | | |
| | 3 | - | Current rating (60 = 6 A) | | | | |
| | 4 | - | Package type (N3 = DFN33A package) | | | | |
| | 5 | - | Voltage rating (D = 200 V, G = 400 V, J = 600 V) | | | | |
| | 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 |
| SE60N3J-M3/I | 0.031 | I | 6000 | 13" diameter plastic tape and reel |
| SE60N3JHM3/I (1) | 0.031 | I | 6000 | 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)

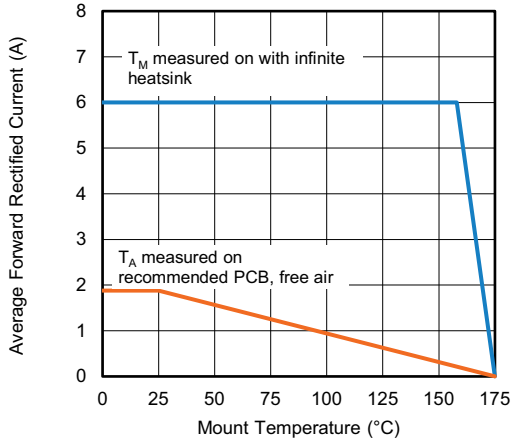


Fig. 1 - Maximum Forward Current Derating Curve

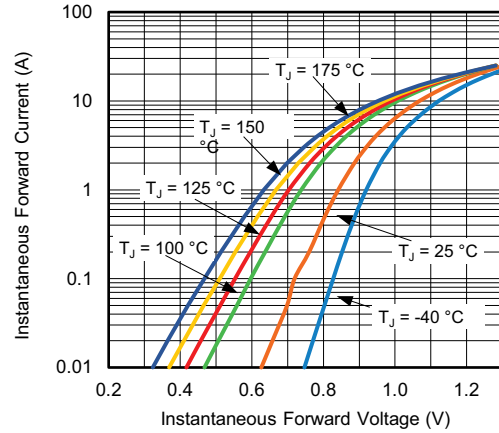


Fig. 3 - Typical Instantaneous Forward Characteristics

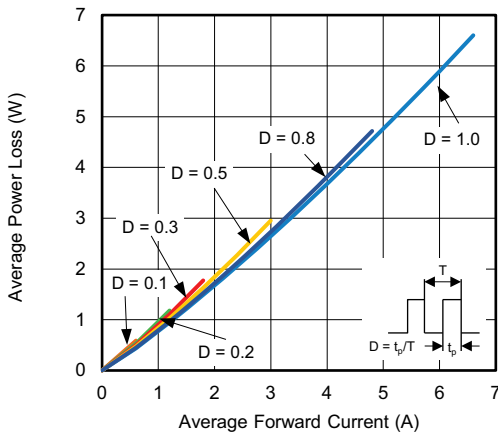


Fig. 2 - Forward Power Loss Characteristics

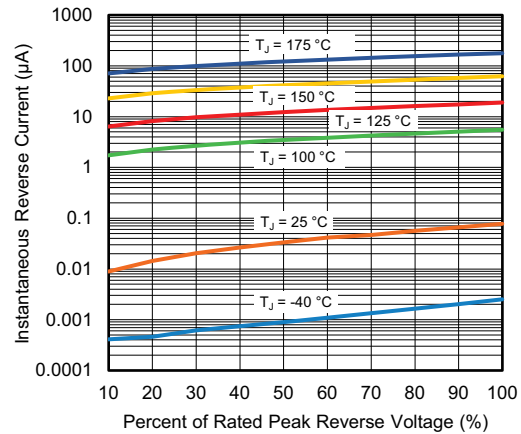


Fig. 4 - Typical Reverse Leakage Characteristics

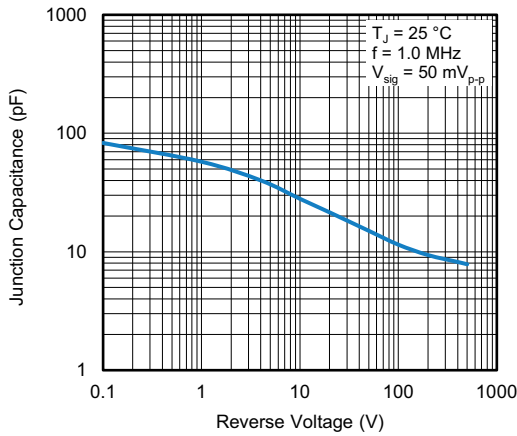


Fig. 5 - Typical Junction Capacitance

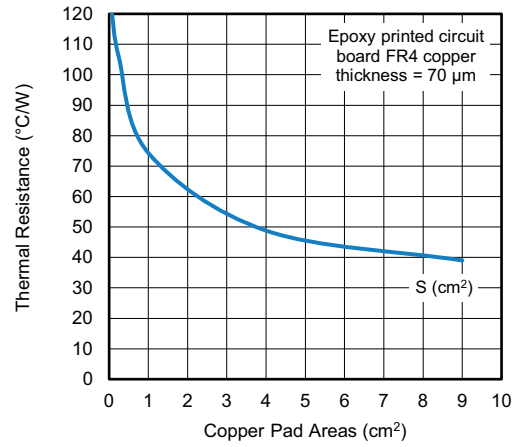


Fig. 7 - Thermal Resistance Junction -to-Ambient vs. Copper Pad Areas

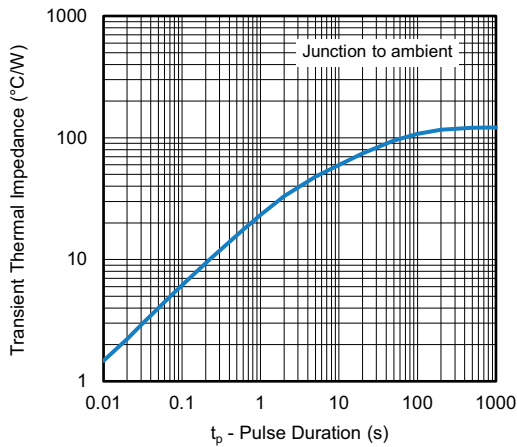
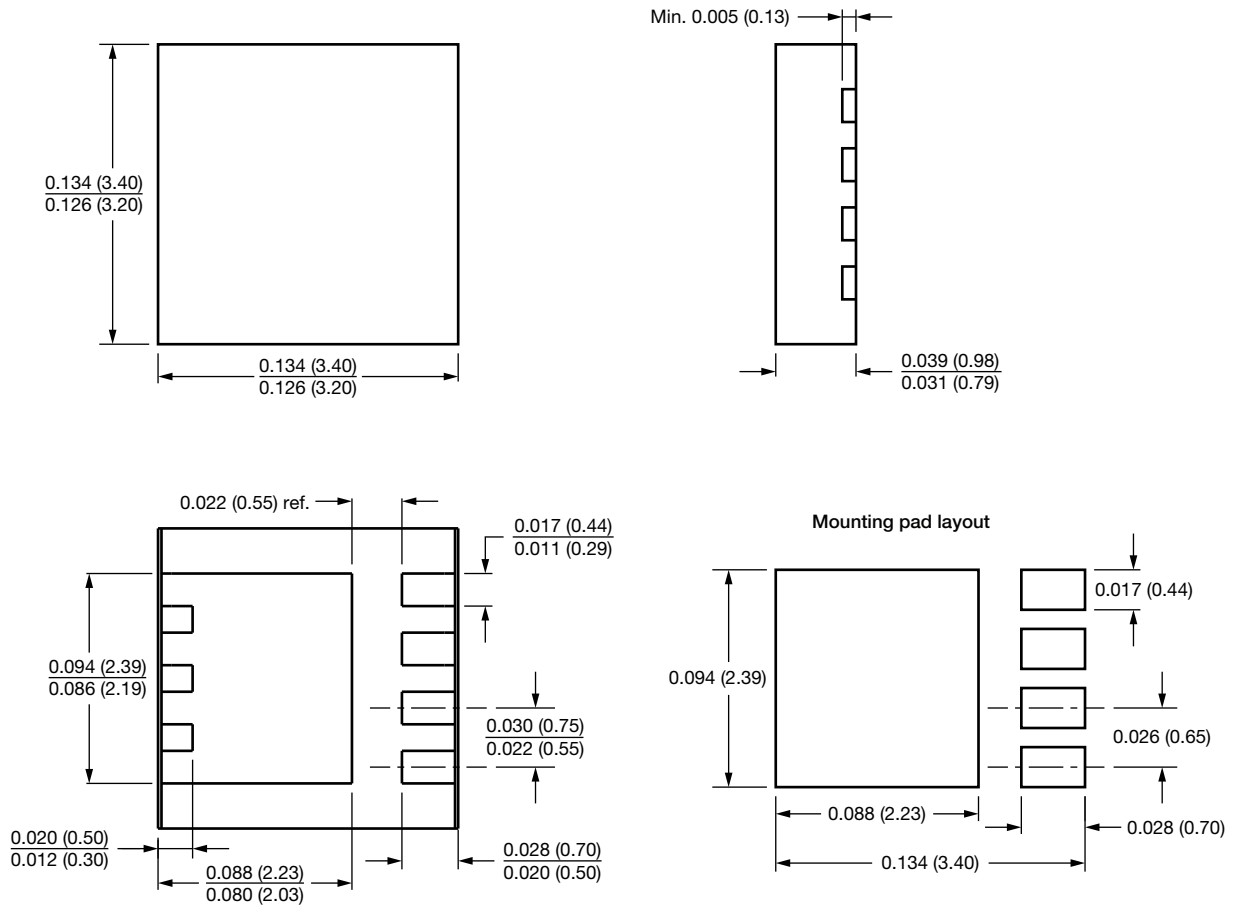


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN33A





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