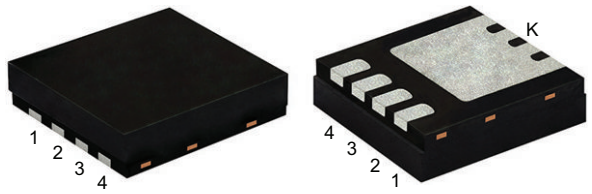
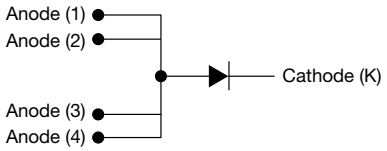
Surface-Mount Standard Rectifier



DFN33A



LINKS TO ADDITIONAL RESOURCES

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

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 μA
- 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

AUTOMOTIVE GRADE Available

Pb 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: $dP_D/dT_J < 1/R_{\theta JA}$

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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 = 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	$R_{\theta JA}$ (1)(2)	122	153	°C/W
	$R_{\theta JM}$ (3)	2.9	3.6	

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

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)

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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 °C unless otherwise noted)

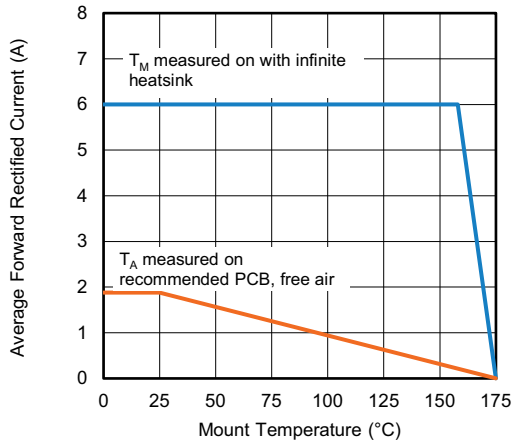

Fig. 1 - Maximum Forward Current Derating Curve

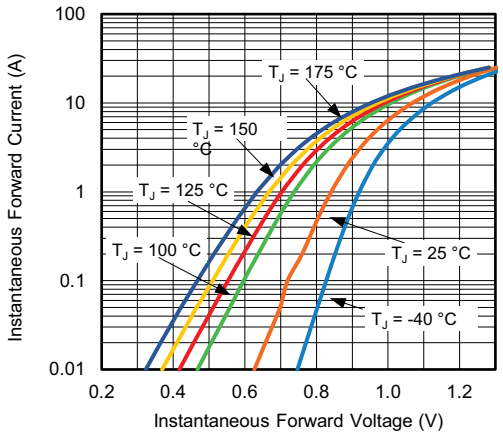

Fig. 3 - Typical Instantaneous Forward Characteristics

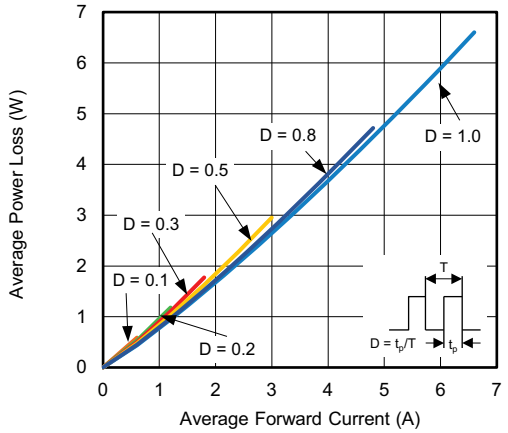

Fig. 2 - Forward Power Loss Characteristics

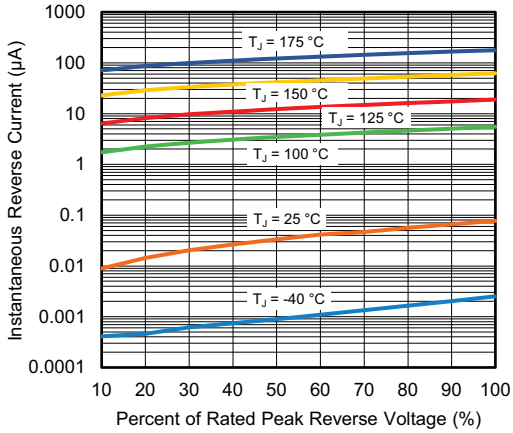

Fig. 4 - Typical Reverse Leakage Characteristics

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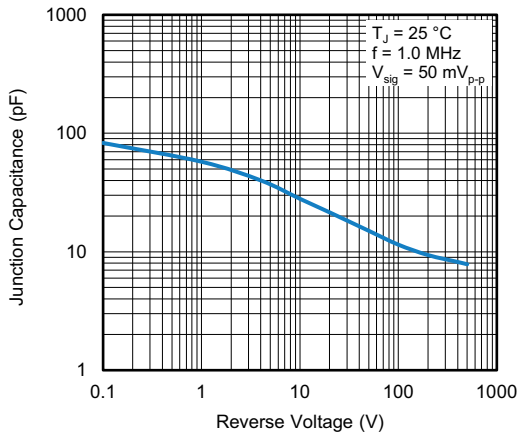

Fig. 5 - Typical Junction Capacitance

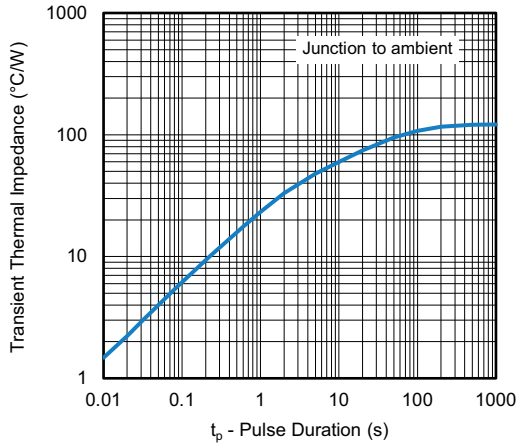

Fig. 6 - Typical Transient Thermal Impedance

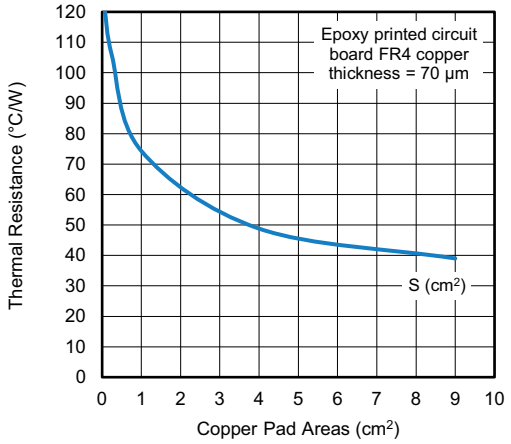

Fig. 7 - Thermal Resistance Junction -to-Ambient vs. Copper Pad Areas

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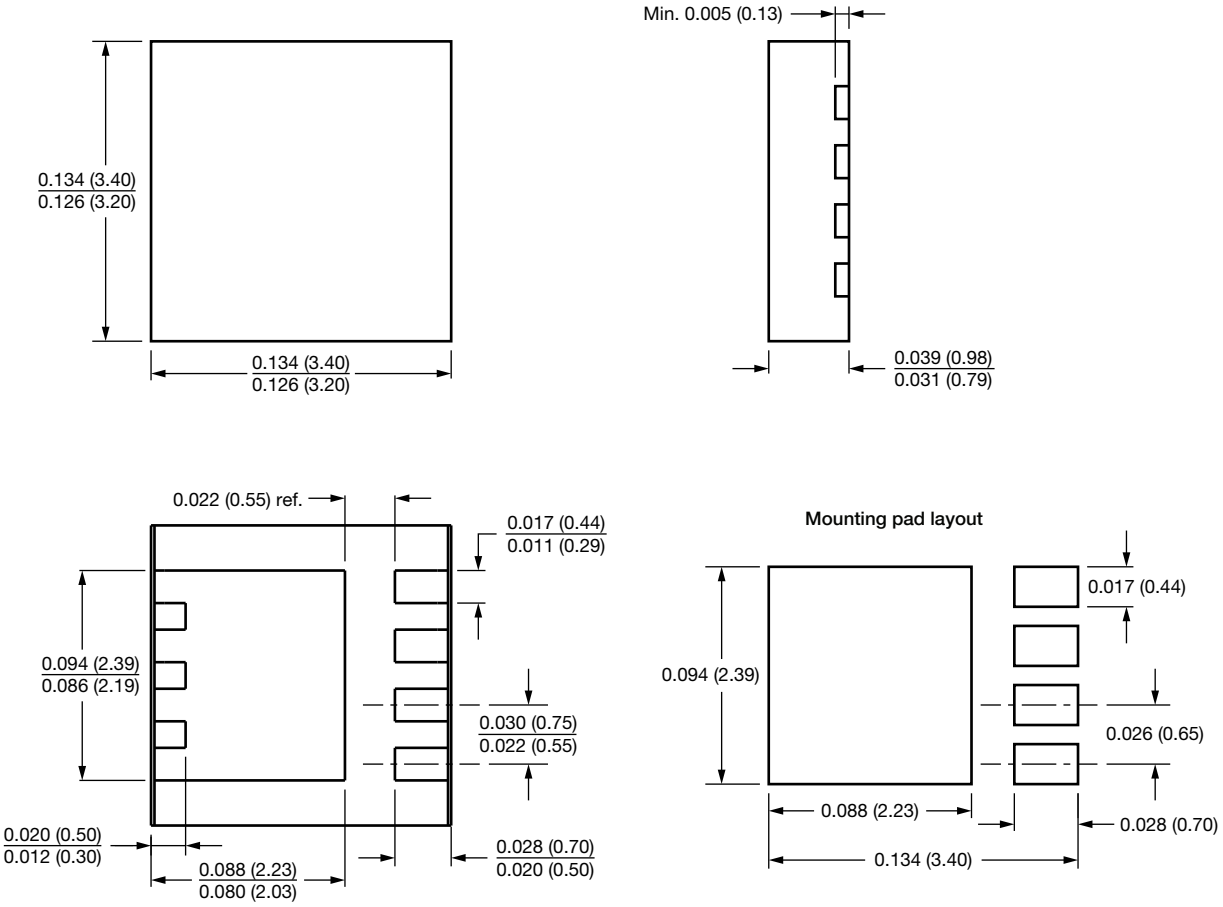
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN33A



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