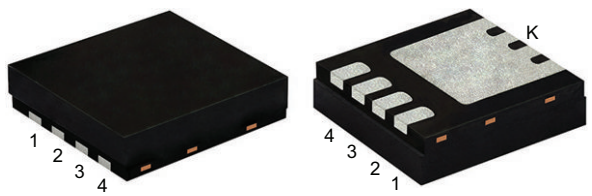
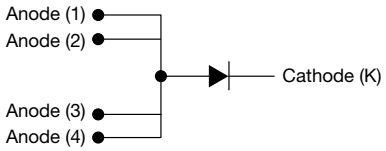
Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



DFN33A



FEATURES

- Low profile package - typical height of 0.88 mm
- Leadless DFN package with side-wettable flanks suitable for customer AOI (Automatic Optical Inspection)
- Very low voltage drop by TMBS Gen3 technology
- Low power losses, high efficiency
- 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

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	9 A
V_{RRM}	150 V
I_{FSM}	150 A
V_F at I_F = 4.5 A (T_J = 125 °C)	0.56 V
T_J max.	175 °C
Package	DFN33A
Circuit configuration	Single

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MECHANICAL DATA

Case: DFN33A

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

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V9N3M153**	**UNIT**
Device marking code		9M153	
Maximum repetitive peak reverse voltage	V_{RRM}	150	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ (1)	9	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}	150	A
Operating junction temperature range	T_J (3)	-40 to +175	°C
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 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I_F = 4.5 A	T_J = 25 °C	V_F (1)	0.70	-	V
	I_F = 9 A			0.85	1.00	
	I_F = 4.5 A	T_J = 125 °C		0.56	-	
	I_F = 9 A			0.64	0.69	
Reverse current	V_R = 100 V	T_J = 25 °C	I_R (2)	0.0014	-	mA
		T_J = 125 °C		1.2	-	
	V_R = 150 V	T_J = 25 °C	I_R (2)	-	0.1	mA
		T_J = 125 °C		3	8	
Typical junction capacitance	4.0 V, 1 MHz		C_J	510	-	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)	118	148	°C/W
	$R_{\theta JA}$ (3)	-	65	
	$R_{\theta JM}$ (4)	2.9	3.63	

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-ambient, free air with device mounted on FR4 PCB, 2 oz., 20 mm x 20 mm pad area

(4) Thermal resistance junction-to-mount to follow JEDEC 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION TABLE

Device code

V	9	N3	M	15	3	H	M3
1	2	3	4	5	6	7	8

1 - Vishay TMBS product

2 - Current rating (9 = 9 A)

3 - Package type (N3 = DFN33A)

4 - Process type option (M = low I_R)

5 - Voltage rating (15 = 150 V)

6 - TMBS generation option (3 = Gen3)

7 - Quality grade (H = AEC-Q101 qualified, otherwise = industry grade)

8 - 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
V9N3M153-M3/I	0.031	I	6000	13" diameter plastic tape and reel
V9N3M153HM3/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)

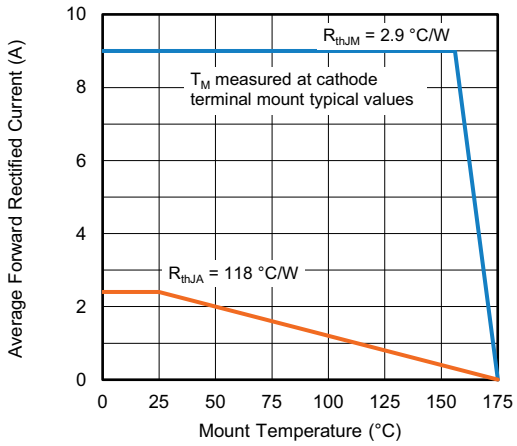


Fig. 1 - Maximum Forward Current Derating Curve

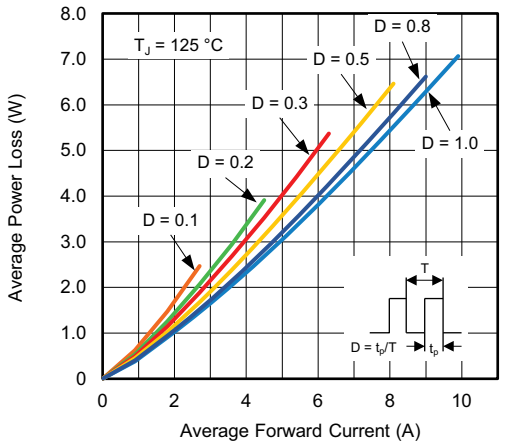


Fig. 2 - Forward Power Loss Characteristics

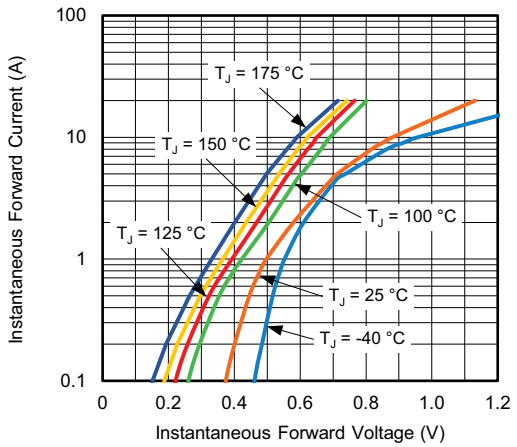


Fig. 3 - Typical Instantaneous Forward Characteristics

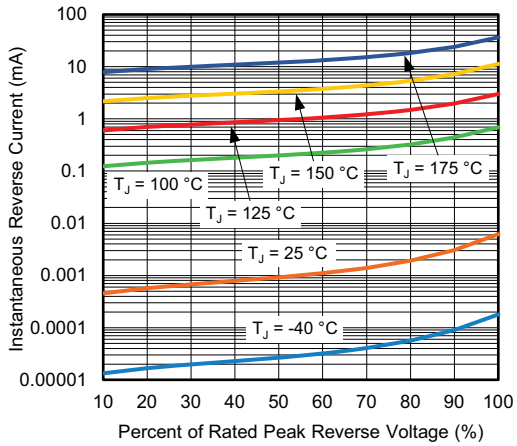


Fig. 4 - Typical Reverse Characteristics

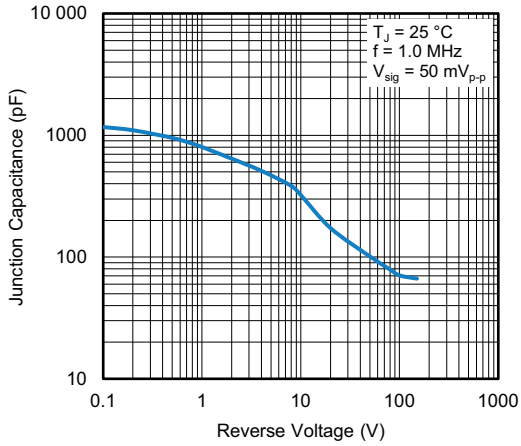


Fig. 5 - Typical Junction Capacitance

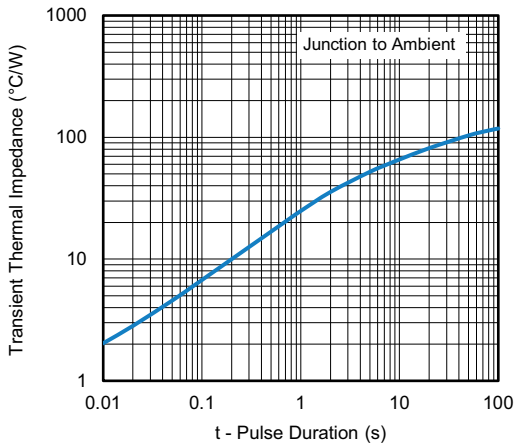


Fig. 6 - Typical Transient Thermal Impedance

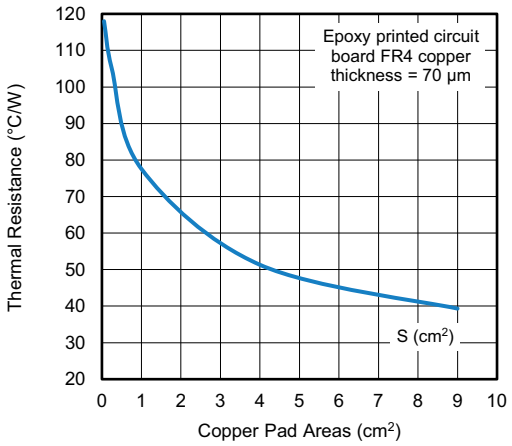
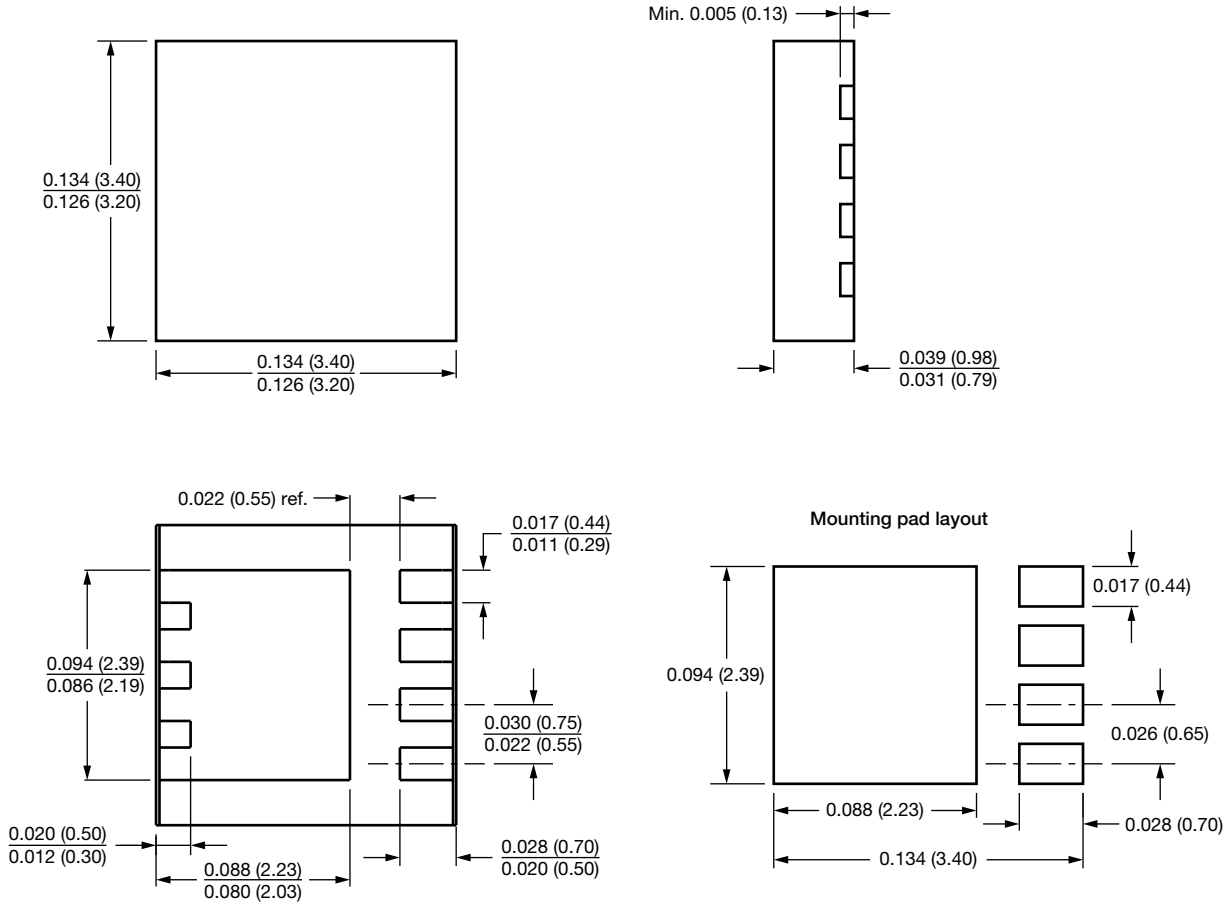


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN33A



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