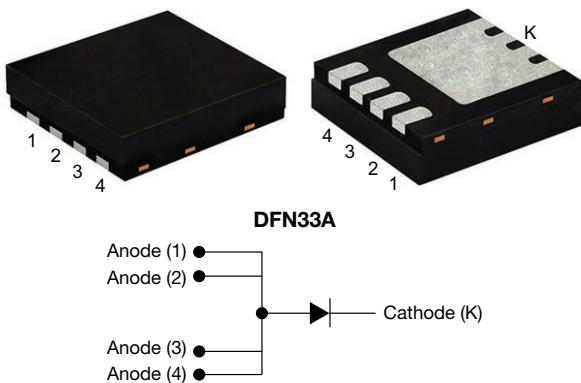


Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



LINKS TO ADDITIONAL RESOURCES



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

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	7 A
V_{RRM}	150 V
I_{FSM}	120 A
V_F at $I_F = 3.5$ A ($T_J = 125$ °C)	0.56 V
T_J max.	175 °C
Package	DFN33A
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	V7N3M153	UNIT
Device marking code		7M153	
Maximum repetitive peak reverse voltage	V_{RRM}	150	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	7	A
	$I_{F(AV)}^{(2)}$	2.2	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	120	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 ($T_J = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	
Instantaneous forward voltage	$I_F = 3.5 \text{ A}$	$T_J = 25^\circ\text{C}$	V_F ⁽¹⁾	0.71	-	
	$I_F = 7 \text{ A}$			0.9	0.98	
	$I_F = 3.5 \text{ A}$	$T_J = 125^\circ\text{C}$		0.56	-	
	$I_F = 7 \text{ A}$			0.64	0.69	
Reverse current	$V_R = 100 \text{ V}$	$T_J = 25^\circ\text{C}$	I_R ⁽²⁾	0.0012	-	
		$T_J = 125^\circ\text{C}$		1.0	-	
	$V_R = 150 \text{ V}$	$T_J = 25^\circ\text{C}$	I_R ⁽²⁾	-	0.07	
		$T_J = 125^\circ\text{C}$		2.5	7	
Typical junction capacitance	4.0 V, 1 MHz		C_J	390	-	
					pF	

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ 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		

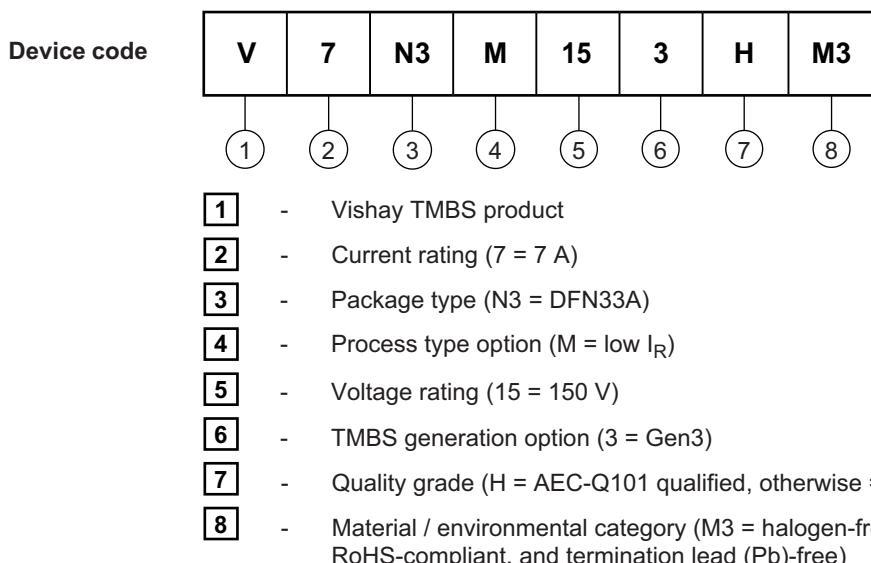
Notes

(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


ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V7N3M153-M3/I	0.031	I	6000	13" diameter plastic tape and reel	
V7N3M153HM3/I ⁽¹⁾	0.031	I	6000	13" diameter plastic tape and reel	

Note

(1) AEC-Q101 qualified

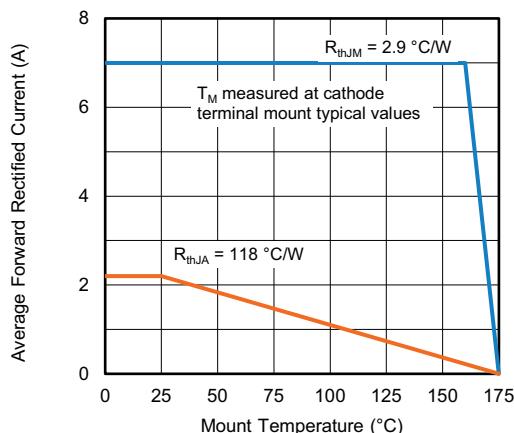
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

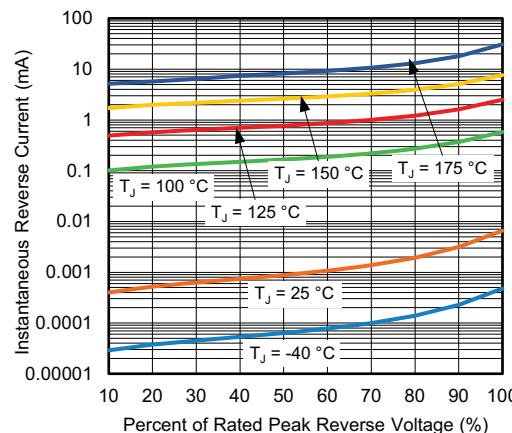


Fig. 4 - Typical Reverse Characteristics

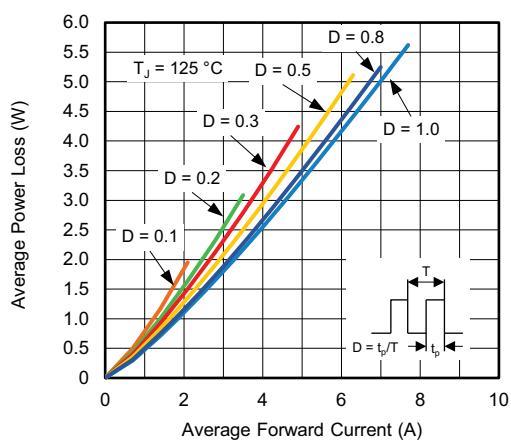


Fig. 2 - Forward Power Loss Characteristics

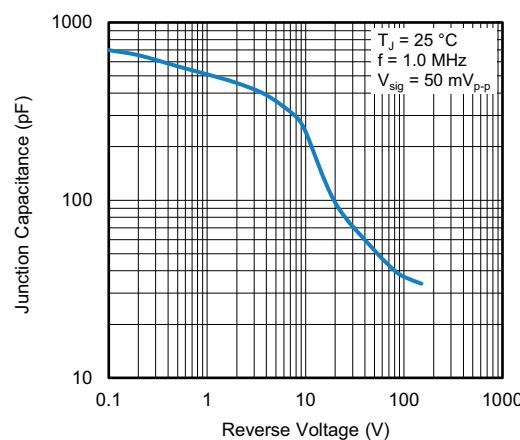


Fig. 5 - Typical Junction Capacitance

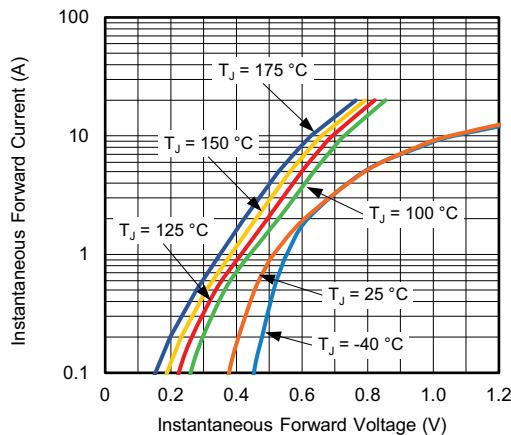


Fig. 3 - Typical Instantaneous Forward Characteristics

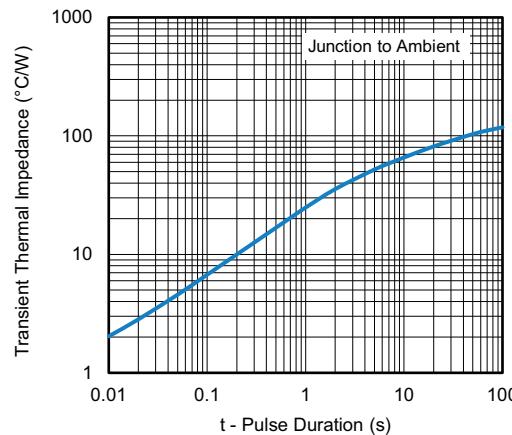


Fig. 6 - Typical Transient Thermal Impedance

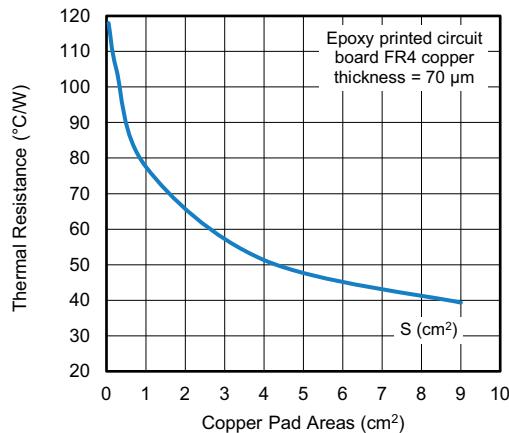
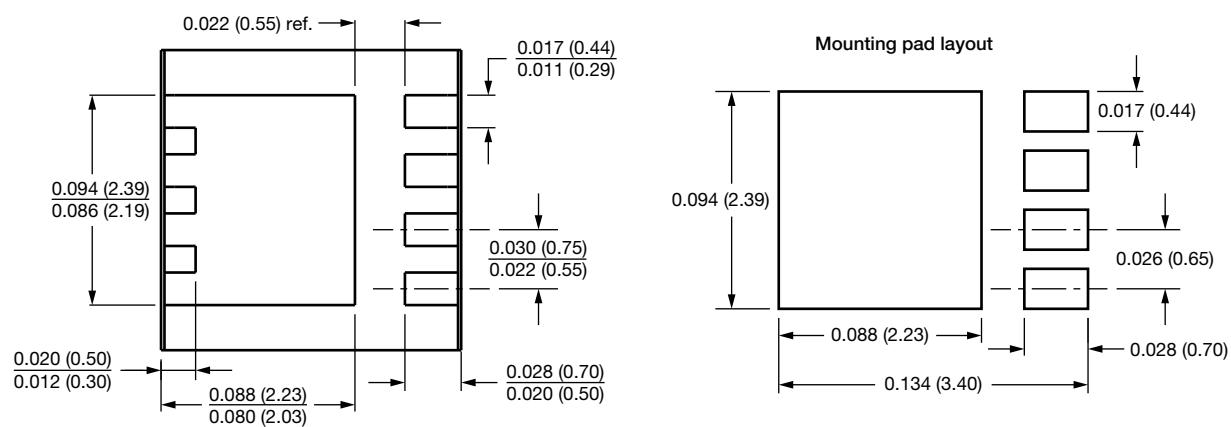
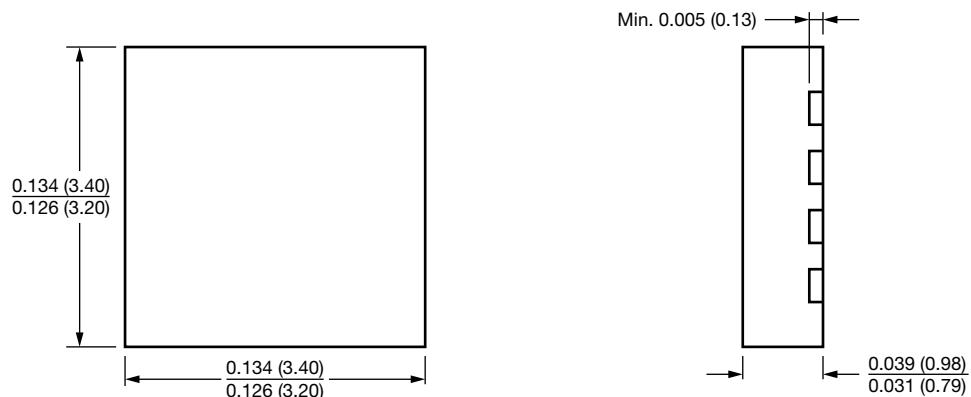


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN33A



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