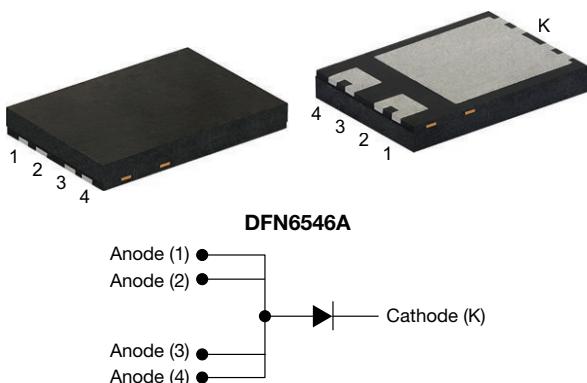


High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.40 V at I_F = 5 A



LINKS TO ADDITIONAL RESOURCES


[Application Notes](#)

[Marking](#)

[Packages](#)

RoHS
COMPLIANT
HALOGEN
FREE

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 forward voltage by TMBS Gen3 technology
- Low power losses, high efficiency
- Compatible to SMPC (TO-277A) package case outline
- 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: DFN6546A

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 meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_F(AV)$	20 A
V_{RRM}	100 V
I_{FSM}	260 A
V_F at I_F = 20 A (T_J = 125 °C)	0.58 V
T_J max.	175 °C
Package	DFN6546A
Circuit configuration	Single

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V20N6M103	UNIT
Device marking code		20M13	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	$I_F(AV)$ (1)	20	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	260	A
Operating junction temperature range	T_J (2)	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Notes

(1) With infinite heatsink

(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 ($T_J = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.
Instantaneous forward voltage	$I_F = 5 \text{ A}$	$T_J = 25^\circ\text{C}$	$V_F^{(1)}$	0.50	-
	$I_F = 10 \text{ A}$			0.55	-
	$I_F = 20 \text{ A}$			0.66	0.73
	$I_F = 5 \text{ A}$			0.40	-
	$I_F = 10 \text{ A}$			0.48	-
	$I_F = 20 \text{ A}$			0.58	0.62
Reverse current	I_R at 70 V	$T_J = 25^\circ\text{C}$	$I_R^{(2)}$	0.007	-
		$T_J = 125^\circ\text{C}$		3	-
	$V_R = 100 \text{ V}$	$T_J = 25^\circ\text{C}$		-	0.55
		$T_J = 125^\circ\text{C}$		8.5	26
Typical junction capacitance	4.0 V, 1 MHz		C_J	2300	-
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 noted)					
PARAMETER	SYMBOL	TYP.	MAX.	UNIT	
Thermal resistance	$R_{\theta JM}^{(1)}$		2	2.5	$^\circ\text{C}/\text{W}$

Note

(1) Thermal resistance junction to mount follows JEDEC® 51-14 transient dual interface test method (TDIM)

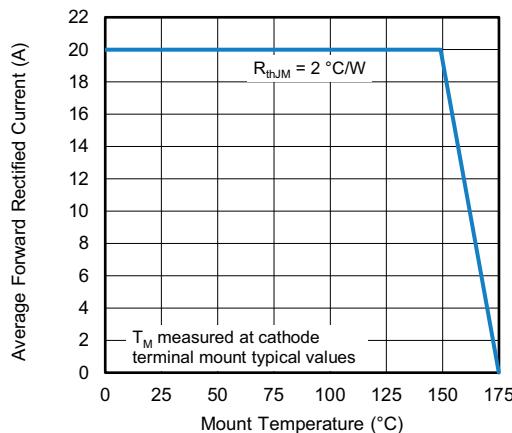
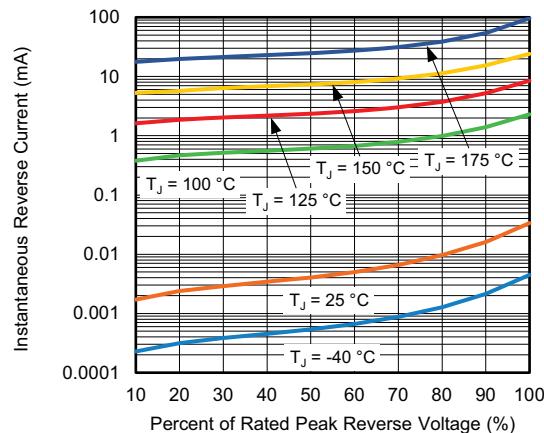
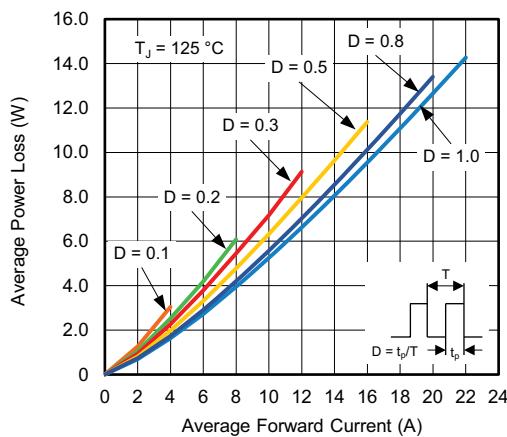
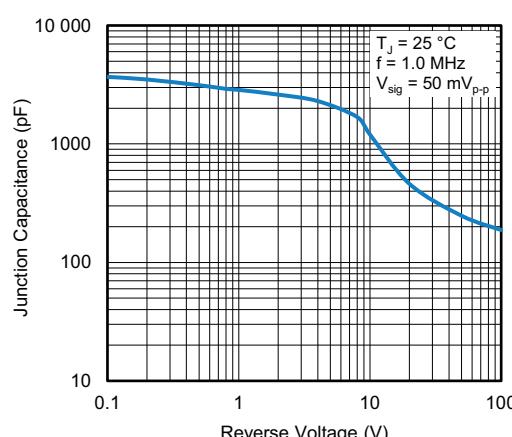
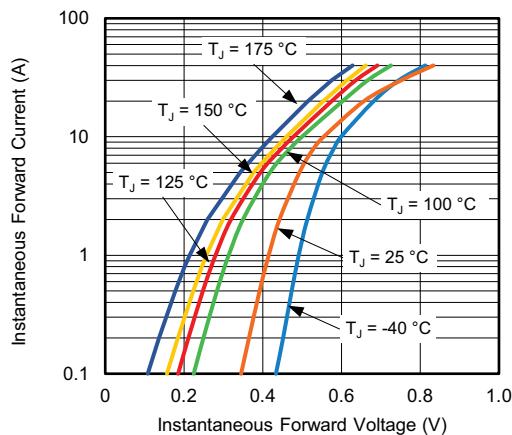
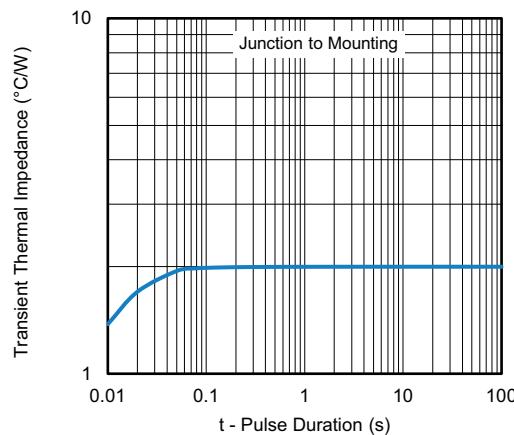
ORDERING INFORMATION TABLE

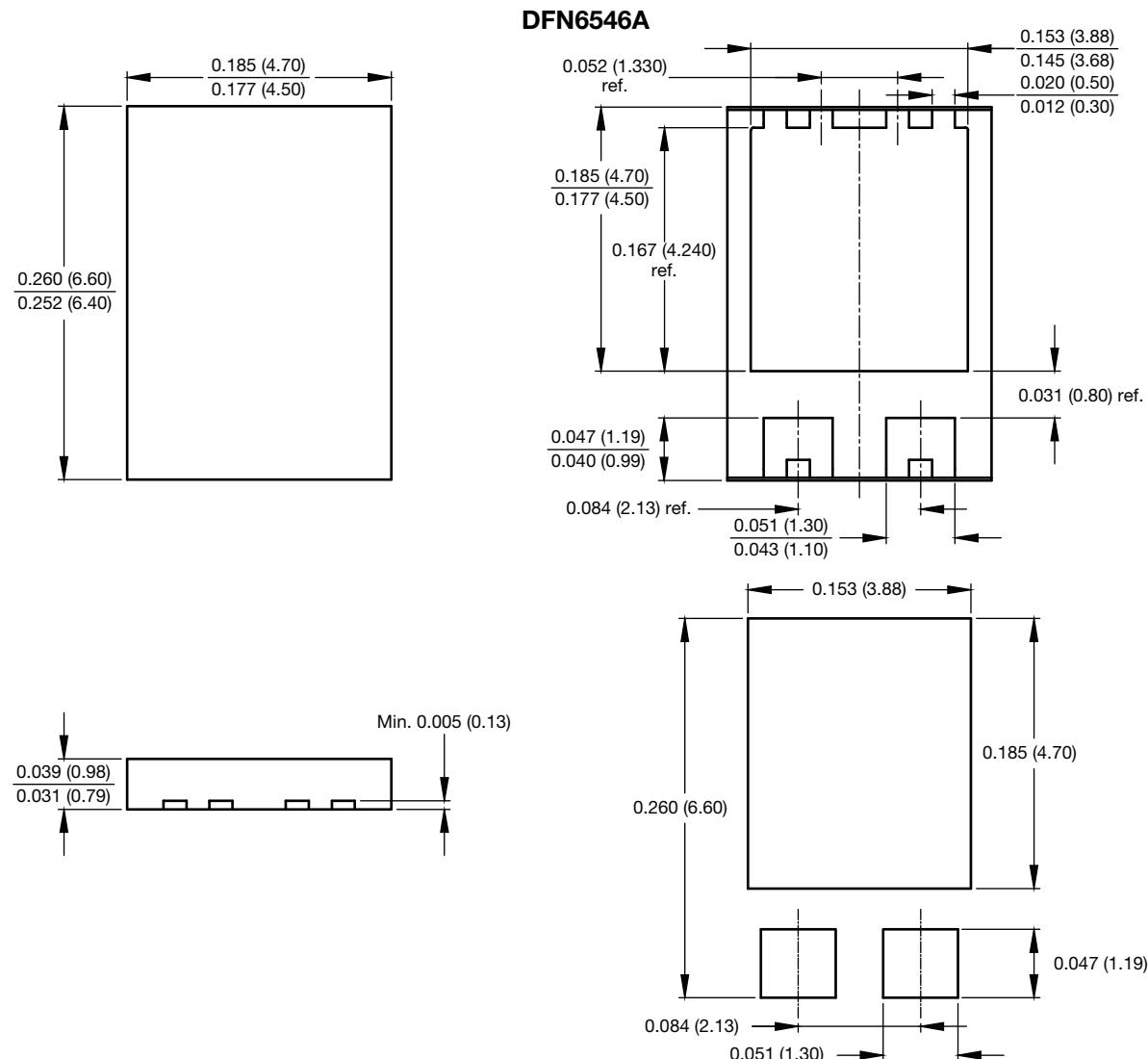
Device code	V	20	N6	M	10	3	H	M3
	1	2	3	4	5	6	7	8
1	-	Vishay TMBS product						
2	-	Current rating (20 = 20 A)						
3	-	Package type (N6 = DFN6546A package)						
4	-	Process type (M = low I_R)						
5	-	Voltage rating (10 = 100 V)						
6	-	TMBS generation option (3 = Gen 3)						
7	-	Quality grade (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
V20N6M103-M3/I	0.086	I	6000	13" diameter plastic tape and reel
V20N6M103HM3/I ⁽¹⁾	0.086	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 - Forward Current Derating Curve

Fig. 4 - Typical Reverse Leakage Characteristics

Fig. 2 - Forward Power Loss Characteristics

Fig. 5 - Typical Junction Capacitance

Fig. 3 - Typical Instantaneous Forward Characteristics

Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)


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