

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



DFN3820A

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3 A
V_{RRM}	150 V
I_{FSM}	80 A
V_F at $I_F = 1.5$ A ($T_J = 125$ °C)	0.55 V
T_J max.	175 °C
Package	DFN3820A
Circuit configuration	Single

FEATURES

- Low profile package - typical height of 0.88 mm
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code; base P/NHM3
- Compatible to SMP (DO-220AA) package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DFN3820A

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

Polarity: color band denotes the cathode end

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V3NM153	UNIT
Device marking code		3MP	
Maximum repetitive peak reverse voltage	V_{RRM}	150	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	3	A
	$I_{F(AV)}^{(2)}$	1.8	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80	A
Operating junction and storage temperature range	$T_J^{(3)}$	-40 to +175	°C
Operating junction and storage temperature range	T_{STG}	-55 to +175	°C

Notes

- (1) Mounted on 10 mm x 10 mm copper pad area PCB
- (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 = 1.5 A	T _J = 25 °C	V _F ⁽¹⁾	0.69	-	V
	I _F = 3.0 A			0.85	0.97	
	I _F = 1.5 A	T _J = 125 °C		0.55	-	
	I _F = 3.0 A			0.62	0.68	
Reverse current	V _R = 100 V	T _J = 25 °C	I _R ⁽²⁾	0.0003	-	mA
		T _J = 125 °C		0.5	-	
	V _R = 150 V	T _J = 25 °C		-	0.035	
		T _J = 125 °C		1.2	3	
Typical junction capacitance	4.0 V, 1 MHz		C _J	160	-	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⁾	135	169	°C/W
	R _{θJM} ⁽³⁾	5	6.3	

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)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V3NM153-M3/H	0.023	H	3500	7" diameter plastic tape and reel
V3NM153-M3/I	0.023	I	14 000	13" diameter plastic tape and reel
V3NM153HM3/H ⁽¹⁾	0.023	H	3500	7" diameter plastic tape and reel
V3NM153HM3/I ⁽¹⁾	0.023	I	14 000	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)

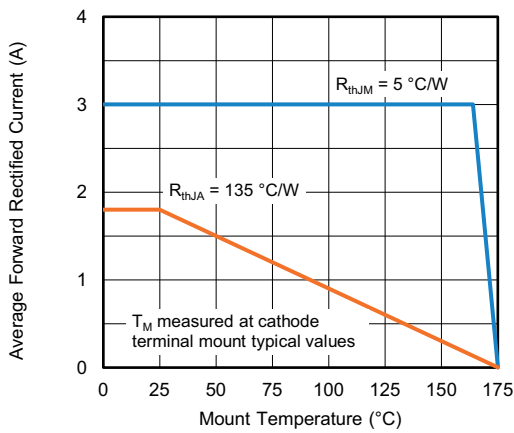


Fig. 1 - Maximum Forward Current Derating Curve

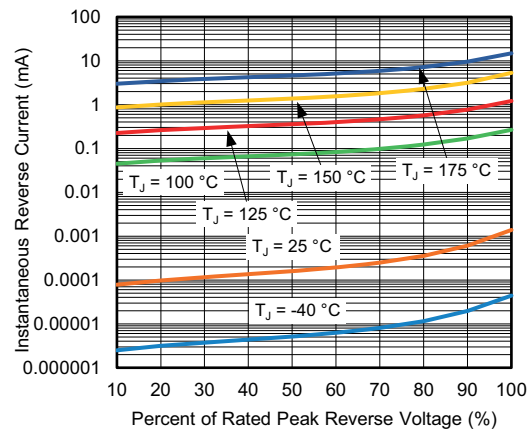


Fig. 4 - Typical Reverse Characteristics

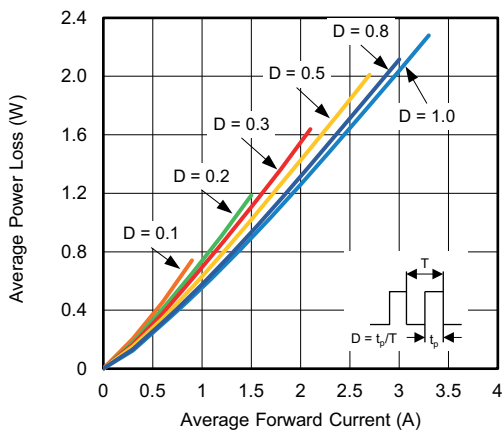


Fig. 2 - Forward Power Loss Characteristics

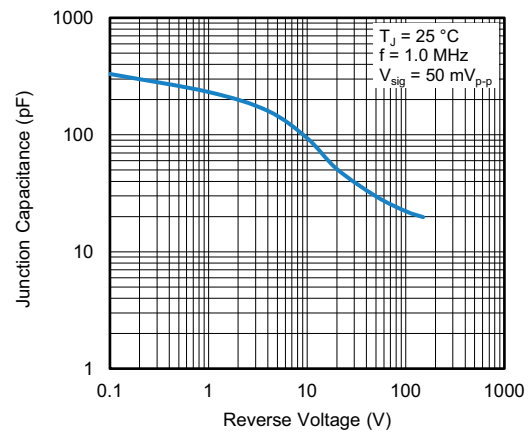


Fig. 5 - Typical Junction Capacitance

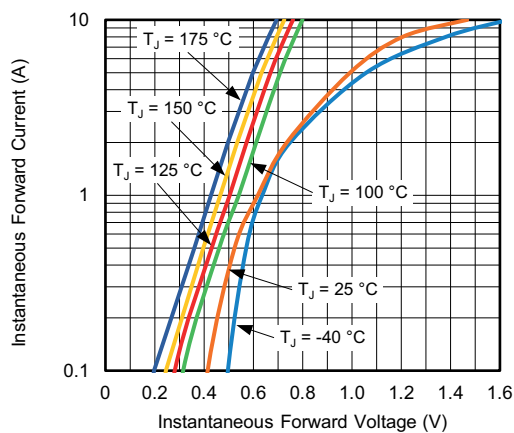


Fig. 3 - Typical Instantaneous Forward Characteristics

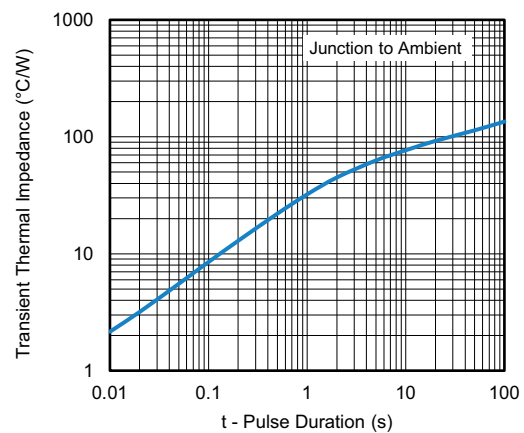
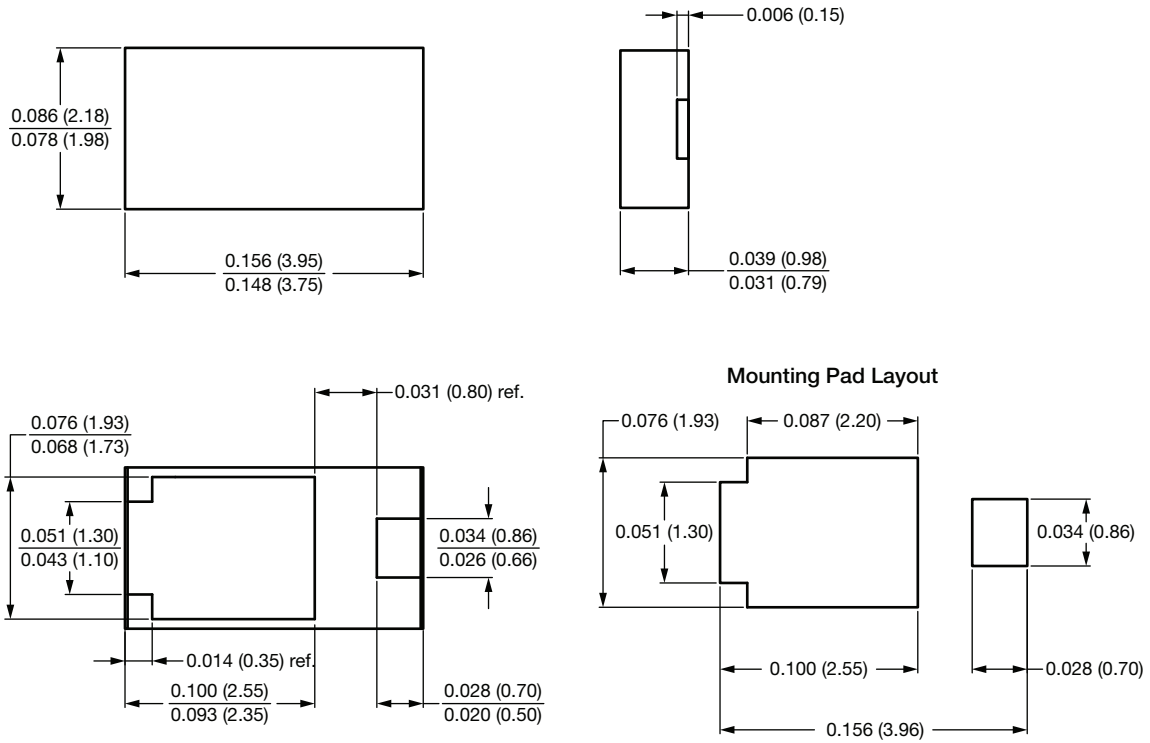


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DFN3820A





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