

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

Ultra Low $V_F = 0.31\text{ V}$ at $I_F = 5\text{ A}$

eSMP® Series



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES



3D Models

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	20 A
V_{RRM}	60 V
I_{FSM}	240 A
V_F at $I_F = 20\text{ A}$ ($T_J = 125\text{ °C}$)	0.53 V
T_J max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

FEATURES

- Very low profile - typical height of 1.1 mm
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- 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



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: SMPC (TO-277A)

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

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V20PL63	UNIT
Device marking code		20L63	
Maximum repetitive peak reverse voltage	V_{RRM}	60	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	20	A
	$I_{F(AV)}^{(2)}$	5	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	240	A
Operating junction temperature range	$T_J^{(3)}$	-40 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Notes

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB

(2) Free air, mounted on recommended copper pad area

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



ELECTRICAL CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5.0\text{ A}$	$V_F^{(1)}$	0.42	-	V
	$I_F = 10\text{ A}$		0.48	-	
	$I_F = 20\text{ A}$		0.57	0.64	
	$I_F = 5.0\text{ A}$		0.31	-	
	$I_F = 10\text{ A}$		0.40	-	
	$I_F = 20\text{ A}$		0.53	0.61	
Reverse current	$V_R = 60\text{ V}$	$T_J = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	-	mA
		$T_J = 125\text{ }^{\circ}\text{C}$	17	45	
Typical junction capacitance	4.0 V, 1 MHz	C_J	3400	-	pF

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: pulse width $\leq 5\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V20PL63	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	75	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	4	

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) Free air mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient(3) Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V20PL63-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V20PL63-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V20PL63HM3/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V20PL63HM3/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

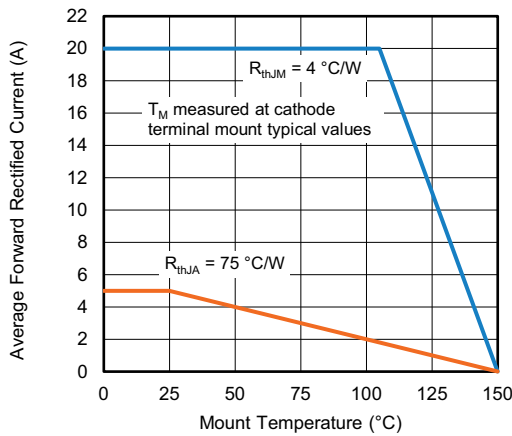
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

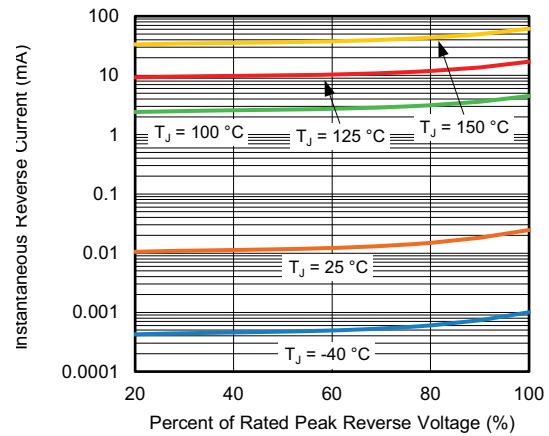


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

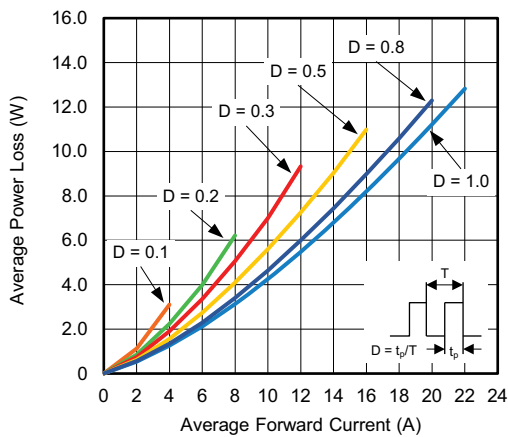


Fig. 2 - Forward Power Loss Characteristics

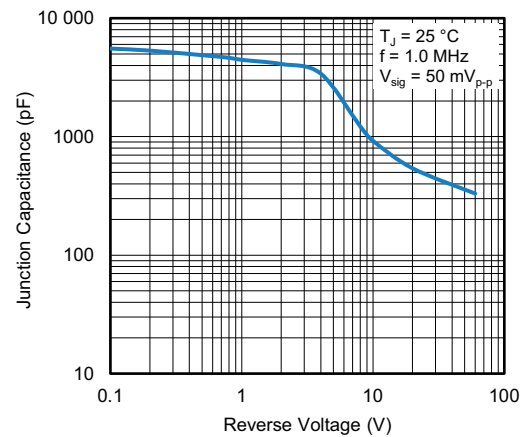


Fig. 5 - Typical Junction Capacitance

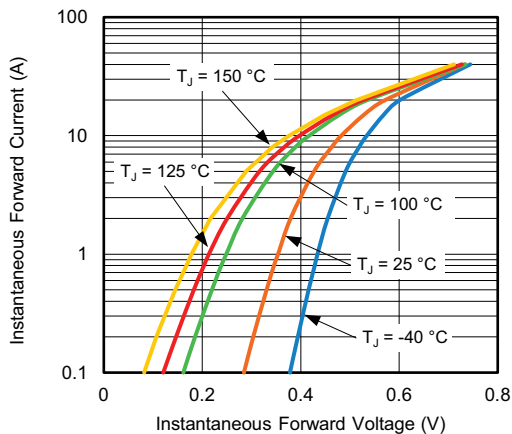


Fig. 3 - Typical Instantaneous Forward Characteristics

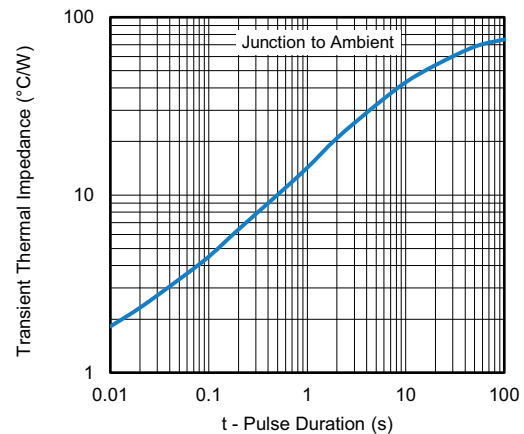


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)




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