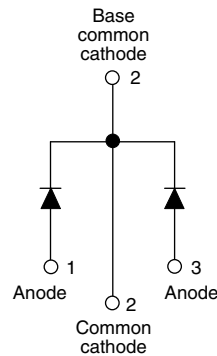


High Performance Schottky Rectifier, 2 x 20 A


TO-247AC 3L


FEATURES

- 150 °C T_J operation
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_R	60 V
V_F at I_F	0.62 V
I_{RM} max.	100 mA at 125 °C
T_J max.	150 °C
E_{AS}	13 mJ
Package	TO-247AC 3L
Circuit configuration	Common cathode

DESCRIPTION

The VS-MBR4060WT... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		60	V
I_{FSM}	$t_p = 5 \mu s$ sine	1020	A
V_F	20 A _{pk} , $T_J = 125$ °C (per leg)	0.62	V
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-MBR4060WT-N3	UNITS
Maximum DC reverse voltage	V_R	60	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg per device	$I_{F(AV)}$	$T_C = 108$ °C, 50 % duty cycle, rectangular waveform	20	A
			40	
Maximum peak one cycle non-repetitive surge current per leg	I_{FSM}	5 μs sine or 3 μs rect. pulse	1020	
		10 ms sine or 6 ms rect. pulse	265	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °C, $I_{AS} = 1.5$ A, $L = 11.5$ mH	13	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	1.5	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	20 A	$T_J = 25\text{ }^\circ\text{C}$	0.72	V
			$T_J = 125\text{ }^\circ\text{C}$	0.62	
Maximum instantaneous reverse current	I_{RM}	Rated DC voltage	$T_J = 25\text{ }^\circ\text{C}$	1.0	mA
			$T_J = 125\text{ }^\circ\text{C}$	100	
Maximum junction capacitance	C_T	$V_R = 5\text{ }V_{DC}$, (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		720	pF
Typical series inductance	L_S	Measured from top of terminal to mounting plane		7.5	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μs

Note(1) Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS		
Maximum junction and storage temperature range	T_J, T_{Stg}			-55 to 150	$^\circ\text{C}$		
Maximum thermal resistance, junction to case per package	R_{thJC}	DC operation		2.20	$^\circ\text{C/W}$		
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		1.10			
Maximum thermal resistance, junction to ambient	R_{thJA}	DC operation		50			
Approximate weight				6	g		
				0.21	oz.		
Mounting torque	<table border="0"> <tr><td>minimum</td></tr> <tr><td>maximum</td></tr> </table>	minimum	maximum			6 (5)	kgf · cm (lbf · in)
		minimum					
maximum							
12 (10)							
Marking device		Case style TO-247AC 3L		MBR4060WT			

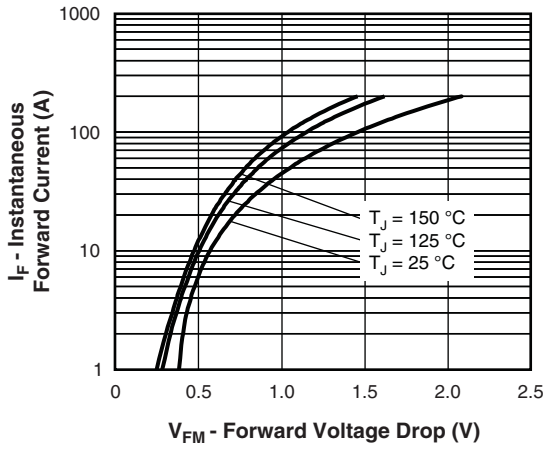


Fig. 1 - Maximum Forward Voltage Drop Characteristics

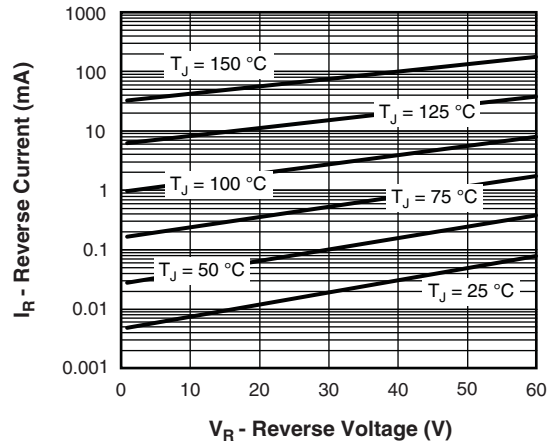


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

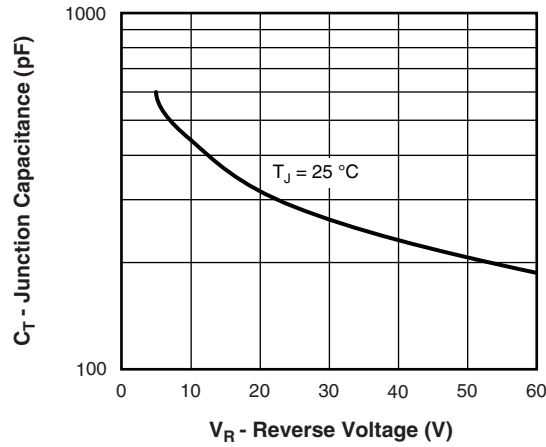


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

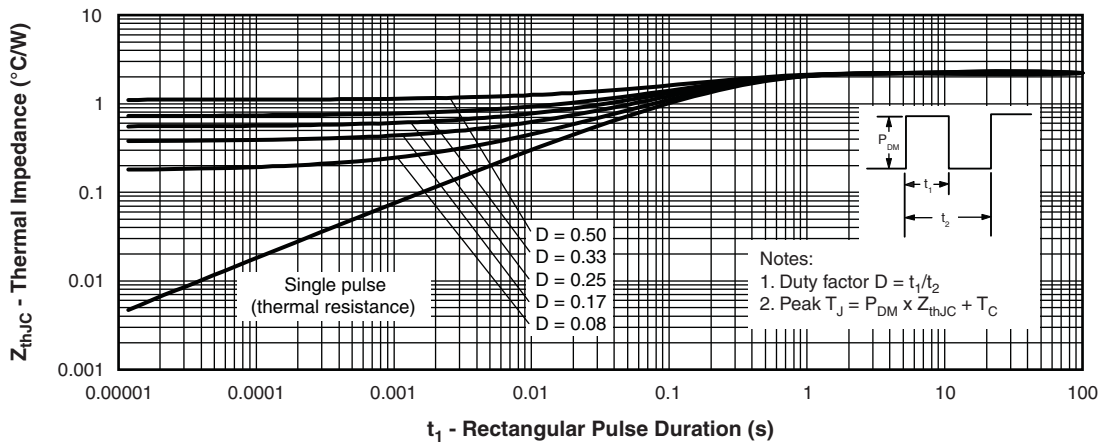


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

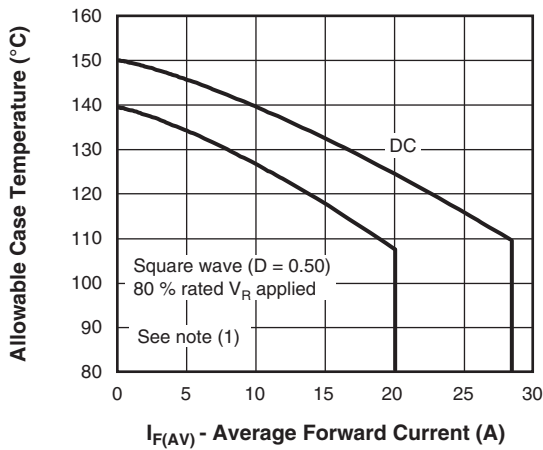


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

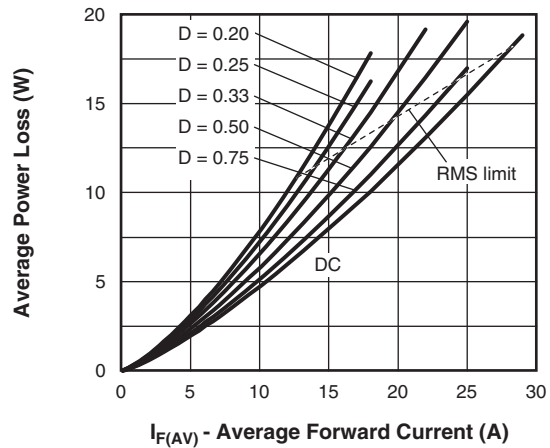


Fig. 6 - Forward Power Loss Characteristics

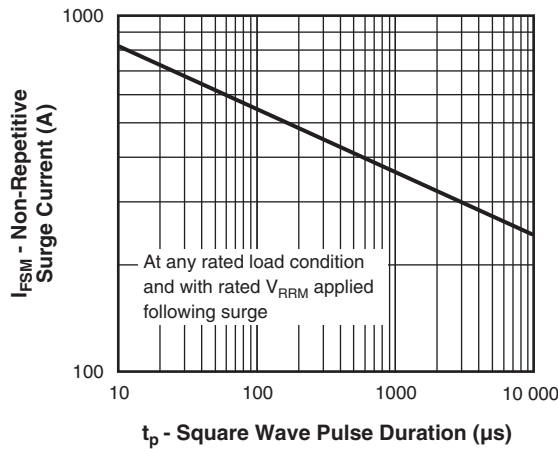


Fig. 7 - Maximum Non-Repetitive Surge Current

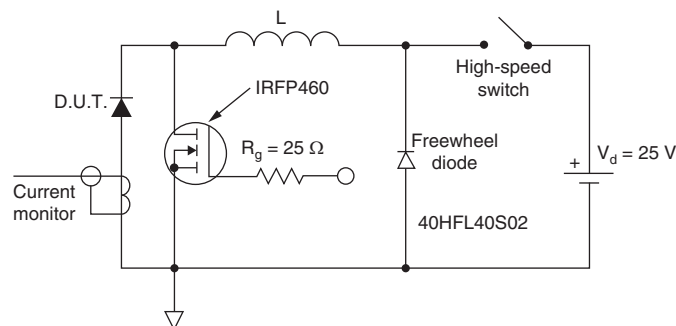


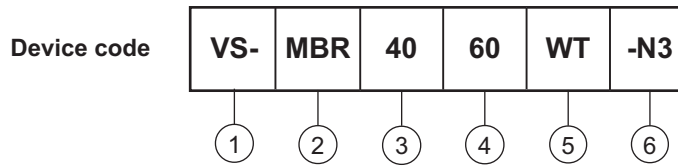
Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
- P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
- $P_{d_{REV}}$ = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Schottky MBR series
- 3** - Current rating (40 = 40 A)
- 4** - Voltage rating (60 = 60 V)
- 5** - Circuit configuration:
Center tap (dual) TO-247
- 6** - Environmental digit
-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBR4060WT-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96138
Part marking information	www.vishay.com/doc?95007



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