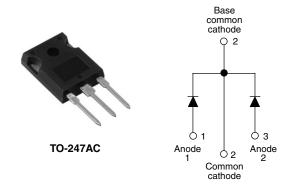


Vishay High Power Products

Schottky Rectifier, 2 x 20 A



PRODUCT SUMMARY				
I _{F(AV)}	2 x 20 A			
V_{R}	60 V			
I _{RM}	100 mA at 125 °C			

FEATURES

- 150 °C T_J operation
- Center tap TO-247 package
- 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 for industrial level

DESCRIPTION

The 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	Α		
V_{RRM}		60	V		
I _{FSM}	t _p = 5 μs sine	1020	Α		
V _F	20 Apk, T _J = 125 °C (per leg)	0.62	V		
T _J	Range	- 55 to 150	°C		

VOLTAGE RATINGS					
PARAMETER	SYMBOL	MBR4060WT	UNITS		
Maximum DC reverse voltage	V_{R}	60	V		
Maximum working peak reverse voltage	V_{RWM}	60	V		

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average per le		T _C = 108 °C, 50 % duty cycle, rectangular waveform		20	
forward current per device	e I _{F(AV)}			40	
Maximum peak one cycle non-repetitive surge current per leg	1	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V _{RRM} applied	1020	A
	IFSM	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 μ s Frequency limited by T _J maximum V _A = 1.5 x V _R typical		1.5	Α

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MBR4060WT

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ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	V _{FM} ⁽¹⁾	20 A	T _J = 25 °C	0.72	V	
			T _J = 125 °C	0.62		
Maximum instantaneous reverse current	I _{RM}	T _J = 25 °C	Rated DC voltage	1.0	mA	
		T _J = 125 °C		100		
Maximum junction capacitance	C _T	$V_R = 5 V_{DC,}$ (test signal range 100 kHz to 1 MHz) 25 °C		720	pF	
Typical series inductance	L _S	Measured from top of terminal to mounting plane		7.5	nΗ	
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/µs	

Note

 $^{^{(1)}\,}$ Pulse width < 300 $\mu s,$ duty cycle < 2 %

THERMAL - MECHAI	THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction and storage temperature range	•	T _J , T _{Stg}		- 55 to 150	°C	
Maximum thermal resistance, junction to case per package		R _{thJC}	DC operation	2.20		
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	1.10	°C/W	
Maximum thermal resistance, junction to ambient		R _{thJA}	DC operation	50		
Approximate weight				6	g	
			0.21	OZ.		
Mounting torque ——	minimum			6 (5)	kgf · cm	
	maximum			12 (10)	(lbf \cdot in)	
Marking device			Case style TO-247AC	MBR4060WT		



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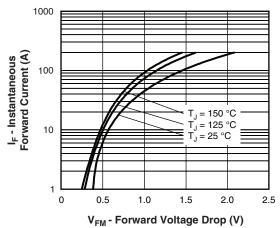


Fig. 1 - Maximum Forward Voltage Drop Characteristics

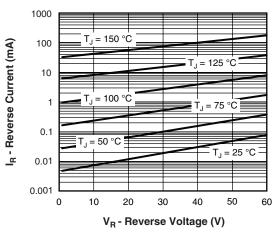


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

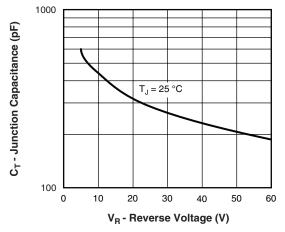


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

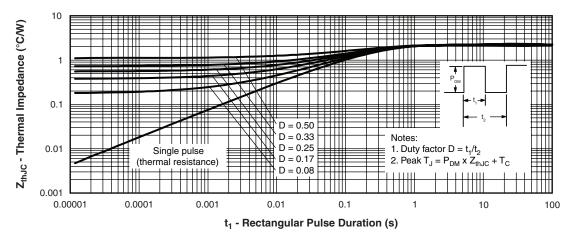
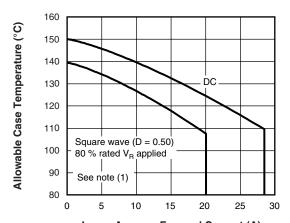


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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I_{F(AV)} - Average Forward Current (A)

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

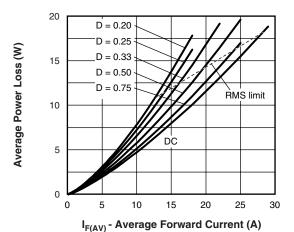


Fig. 6 - Forward Power Loss Characteristics

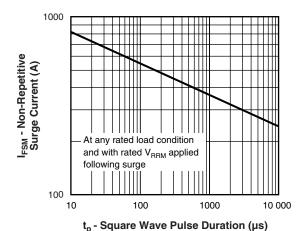


Fig. 7 - Maximum Non-Repetitive Surge Current

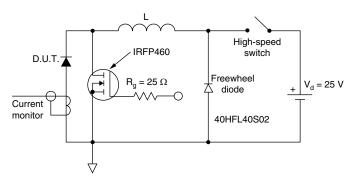


Fig. 8 - Unclamped Inductive Test Circuit

Note

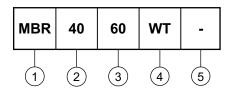
⁽¹⁾ Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$; $\begin{aligned} &\text{Pd} = \text{Forward power loss} = I_{\text{F(AV)}} \text{ x } V_{\text{FM}} \text{ at } (I_{\text{F(AV)}} \text{/D}) \text{ (see fig. 6);} \\ &\text{Pd}_{\text{REV}} = \text{Inverse power loss} = V_{\text{R1}} \text{ x } I_{\text{R}} (1 - D); I_{\text{R}} \text{ at } V_{\text{R1}} = 80 \text{ \% rated } V_{\text{R}} \end{aligned}$



Schottky Rectifier, 2 x 20 A Vishay High Power Products

ORDERING INFORMATION TABLE

Device code



- 1 Schottky MBR series
- 2 Current rating (40 = 40 A)
- Voltage rating (60 = 60 V)
- Circuit configuration:
 Center tap (dual) TO-247
- None = Standard production
 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS			
Dimensions http://www.vishay.com/doc?95223			
Part marking information	http://www.vishay.com/doc?95226		

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Vishay

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