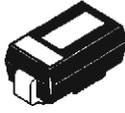


## Schottky Rectifier, 1.0 A


**SMA**


### FEATURES

- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	1.0 A
$V_R$	40 V
$I_{RM}$	26 mA at 125 °C

### DESCRIPTION

The MBRA140TRPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	1.0	A
$V_{RRM}$		40	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	120	A
$V_F$	1.0 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.49	V
$T_J$	Range	- 55 to 150	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	MBRA140TRPbF	UNITS
Maximum DC reverse voltage	$V_R$	40	V
Maximum working peak reverse voltage	$V_{RWM}$		

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum average forward current See fig. 4	$I_{F(AV)}$	50 % duty cycle at $T_L = 118 \text{ }^\circ\text{C}$ , rectangular waveform On PC board 9 mm <sup>2</sup> island (0.013 mm thick copper pad area)	1.0	A	
Maximum peak one cycle non-repetitive surge current See fig. 6	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied		120
		10 ms sine or 6 ms rect. pulse			30
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 1 \text{ A}$ , $L = 6 \text{ mH}$	3.0	mJ	
Repetitive avalanche current	$I_{AR}$		1.0	A	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	1 A	$T_J = 25\text{ }^\circ\text{C}$	0.55	V
		2 A		0.71	
		1 A	$T_J = 100\text{ }^\circ\text{C}$	0.5	
		2 A		0.65	
		1 A	$T_J = 125\text{ }^\circ\text{C}$	0.49	
		2 A		0.63	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.5	mA
		$T_J = 100\text{ }^\circ\text{C}$		10	
		$T_J = 125\text{ }^\circ\text{C}$		26	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.36	V
Forward slope resistance	$r_t$			104	m $\Omega$
Typical junction capacitance	$C_T$	$V_R = 10\text{ V}_{DC}$ , $T_J = 25\text{ }^\circ\text{C}$ , test signal = 1 MHz		38	pF
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		2.0	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu$ s

**Note**

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

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J^{(1)}$ , $T_{Stg}$			- 55 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}^{(2)}$	DC operation See fig. 4		35	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$			80	
Approximate weight				0.07	g
				0.002	oz.
Device marking		Case style SMA (similar D-64)		V14	

**Notes**

(1)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$  thermal runaway condition for a diode on its own heatsink

(2) Mounted 1" square PCB, thermal probe connected to lead 2 mm from package

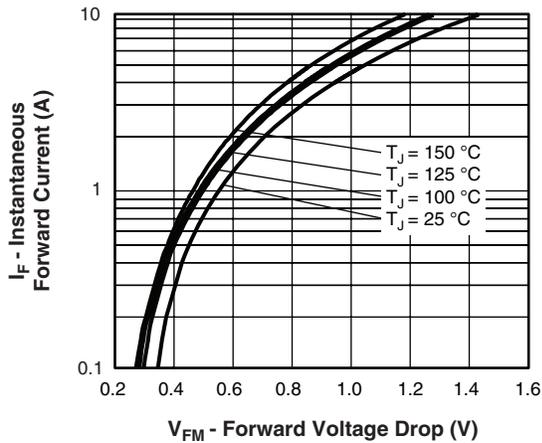


Fig. 1 - Maximum Forward Voltage Drop Characteristics

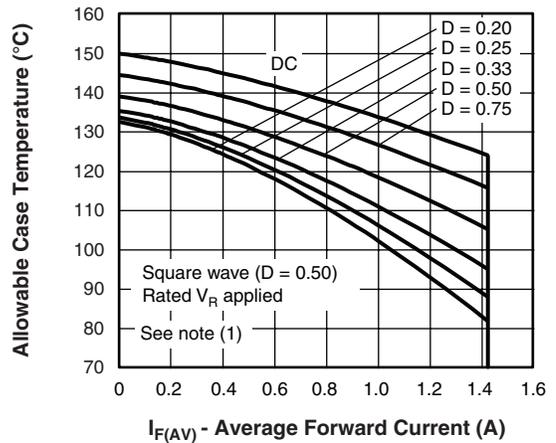


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

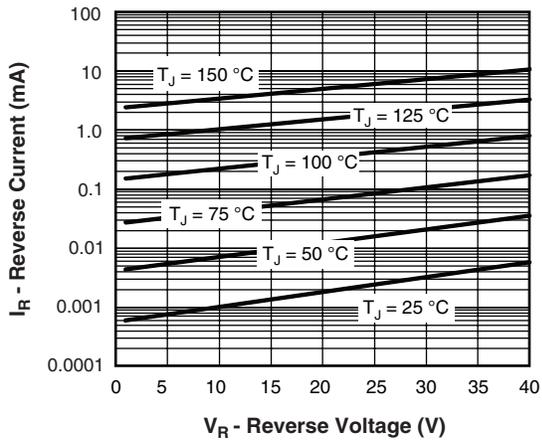


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

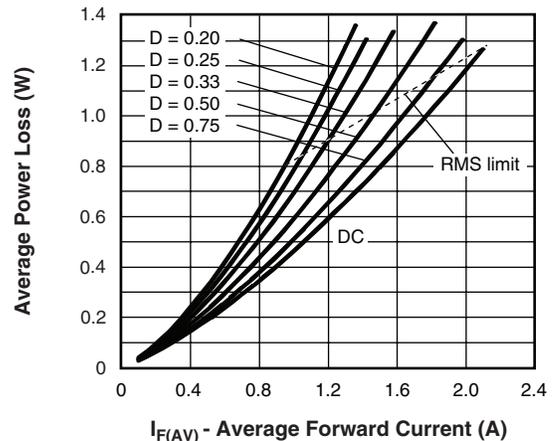


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

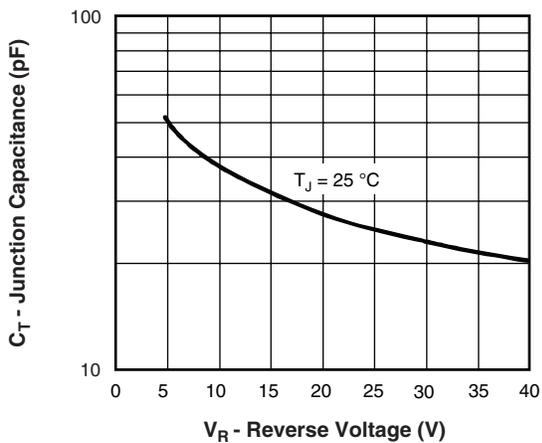


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

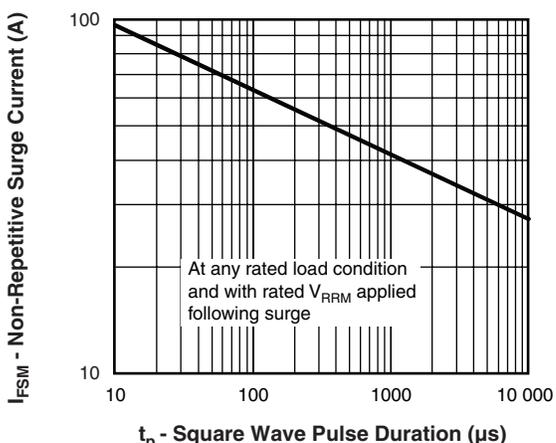


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

**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 =  $V_{R1} \times I_{R1} (1 - D)$ ;  $I_{R1}$  at  $V_{R1} = 80\%$  rated  $V_R$

# MBRA140TRPbF

Vishay High Power Products Schottky Rectifier, 1.0 A



## ORDERING INFORMATION TABLE

Device code	<b>MBR</b>	<b>A</b>	<b>1</b>	<b>40</b>	<b>TR</b>	<b>PbF</b>
	①	②	③	④	⑤	⑥

- 1** - Schottky MBR series
- 2** - A = SMA
- 3** - Current rating (1 = 1 A)
- 4** - Voltage rating (40 = 40 V)
- 5** - TR = Tape and reel (7500 pieces)
- 6** - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95018">http://www.vishay.com/doc?95018</a>
Part marking information	<a href="http://www.vishay.com/doc?95029">http://www.vishay.com/doc?95029</a>
Packaging information	<a href="http://www.vishay.com/doc?95034">http://www.vishay.com/doc?95034</a>



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.