SWITCHMODE™ Power Rectifier

Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 40 A Total (20 A Per Diode Leg)
- Pb-Free Package is Available*

Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation

Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94, V-0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperatures for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B

Machine Model C

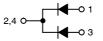
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

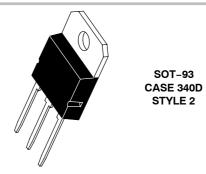


ON Semiconductor®

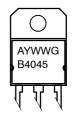
http://onsemi.com

SCHOTTKY BARRIER RECTIFIER 40 AMPERES 45 VOLTS





MARKING DIAGRAM



B4045 = Device Code A = Assembly Location

Y = Year
WW = Work Week
G = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping [†]
MBR4045PT	SOT-93	30 Units/Rail
MBR4045PTG	SOT-93 (Pb-Free)	30 Units/Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V _{RRM} V _{RWM} V _R	45	V
Average Rectified Forward Current (Rated V _R , T _C = 125°C) Per Diode Per Device	I _{F(AV)}	20 40	А
Peak Repetitive Forward Current, (Rated V _R , Square Wave, 20 kHz @ T _C = 90°C) Per Diode	I _{FRM}	40	А
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I _{FSM}	400	А
Peak Repetitive Reverse Current, (2.0 μs, 1.0 kHz)	I _{RRM}	2.0	Α
Storage Temperature Range	T _{stg}	-65 to +175	°C
Operating Junction Temperature (Note 1)	T _J	-65 to +175	°C
Peak Surge Junction Temperature (Forward Current Applied)	$T_{J(pk)}$	175	°C
Voltage Rate of Change	dv/dt	10,000	V/μs

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

THERMAL CHARACTERISTICS

Characteristic	Conditions	Symbol	Max	Unit
Maximum Thermal Resistance, Junction-to-Case	Minimum Pad	$R_{\theta JC}$	1.4	°C/W
Maximum Thermal Resistance, Junction-to-Ambient	Minimum Pad	$R_{\theta JA}$	55	-0/00

ELECTRICAL CHARACTERISTICS

Characteristic		Min	Тур	Max	Unit
Instantaneous Forward Voltage (Note 2) $(i_F = 20 \text{ A}, T_J = 25^{\circ}\text{C})$ $(i_F = 20 \text{ A}, T_J = 125^{\circ}\text{C})$ $(i_F = 40 \text{ A}, T_J = 25^{\circ}\text{C})$ $(i_F = 40 \text{ A}, T_J = 125^{\circ}\text{C})$	V _F		0.53 0.46 0.64 0.62	0.70 0.60 0.80 0.75	V
Instantaneous Reverse Current (Note 2) (Rated DC Voltage, T _J = 25°C) (Rated DC Voltage, T _J = 125°C)	İR	-	0.09 30	1.0 50	mA

^{1.} The heat generated must be less than the thermal conductivity from Junction–to–Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

TYPICAL ELECTRICAL CHARACTERISTICS

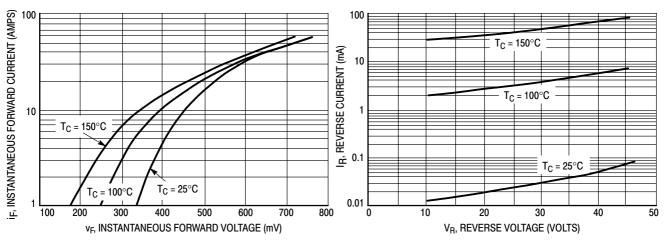


Figure 1. Typical Forward Voltage

Figure 2. Typical Reverse Current

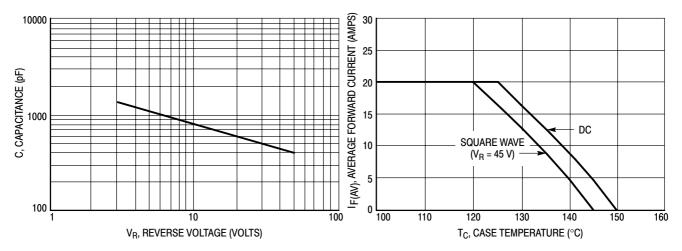
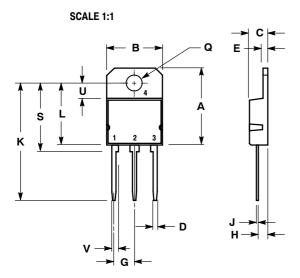


Figure 3. Typical Capacitance Per Leg

Figure 4. Current Derating Per Leg

PACKAGE DIMENSIONS

SOT-93 (TO-218) **PLASTIC** CASE 340D-02 **ISSUE E**



- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2. CONTROLLING DIMENSION: MILLIMETER.

	MILLIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX	
Α		20.35		0.801	
В	14.70	15.20	0.579	0.598	
C	4.70	4.90	0.185	0.193	
D	1.10	1.30	0.043	0.051	
Е	1.17	1.37	0.046	0.054	
G	5.40	5.55	0.213	0.219	
Н	2.00	3.00	0.079	0.118	
J	0.50	0.78	0.020	0.031	
K	31.00	REF	1.220 REF		
L		16.20		0.638	
Q	4.00	4.10	0.158	0.161	
S	17.80	18.20	0.701	0.717	
U	4.00 REF		0.157 REF		
V	1 75 RFF		0.069		

STYLE 2:

PIN 1. ANODE CATHODE

- ANODE
- 3. CATHODE

SWITCHMODE is a trademark of Semiconductor Components Industries, LLC.

ON Semiconductor and un are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice on semiconductor and war engineer trademarks of semiconductor components industries, Ite (SciLLC) solitate services are injective to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor P.O. Box 5163, Denver, Colorado 80217 USA Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada

Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada

Europe, Middle East and Africa Technical Support: Phone: 421 33 790 2910

Japan Customer Focus Center Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative