

# MBR4045WTG

## Switch Mode 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)
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant\*

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

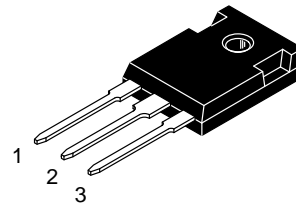
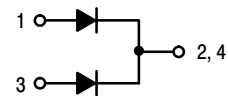
- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 4.3 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine Model C



**ON Semiconductor®**

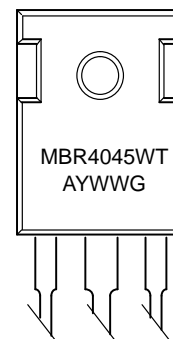
<http://onsemi.com>

**SCHOTTKY BARRIER  
RECTIFIER  
40 AMPERES, 45 VOLTS**



**TO-247  
CASE 340AL**

### MARKING DIAGRAM



MBR4045WT = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MBR4045WTG	TO-247 (Pb-Free)	30 Units/Rail

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

# MBR4045WTG

## 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 $V_R$ , $T_C = 125^\circ\text{C}$ ) Per Diode Per Device	$I_{F(AV)}$	20 40	A
Peak Repetitive Forward Current, (Rated $V_R$ , Square Wave, 20 kHz, $T_C = 90^\circ\text{C}$ ) Per Diode	$I_{FRM}$	40	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	400	A
Peak Repetitive Reverse Current (2.0 $\mu\text{s}$ , 1.0 kHz)	$I_{RRM}$	2.0	A
Storage Temperature Range	$T_{stg}$	-65 to +175	$^\circ\text{C}$
Operating Junction Temperature (Note 1)	$T_J$	-65 to +175	$^\circ\text{C}$
Peak Surge Junction Temperature (Forward Current Applied)	$T_{J(pk)}$	175	$^\circ\text{C}$
Voltage Rate of Change	$dv/dt$	10,000	V/ $\mu\text{s}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

## THERMAL CHARACTERISTICS

Characteristic	Conditions	Symbol	Max	Unit
Maximum Thermal Resistance, Junction-to-Case	Min. Pad	$R_{\theta JC}$	1.4	$^\circ\text{C/W}$
Maximum Thermal Resistance, Junction-to-Ambient	Min. Pad	$R_{\theta JA}$	50.1	$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typical	Max	Unit
Instantaneous Forward Voltage (Note 2) @ $I_F = 20$ Amps, $T_J = 25^\circ\text{C}$ @ $I_F = 20$ Amps, $T_J = 125^\circ\text{C}$ @ $I_F = 40$ Amps, $T_J = 25^\circ\text{C}$ @ $I_F = 40$ Amps, $T_J = 125^\circ\text{C}$	$V_F$	- - - -	0.52 0.47 0.65 0.63	0.70 0.60 0.80 0.75	V
Instantaneous Reverse Current (Note 2) @ Rated DC Voltage, $T_J = 25^\circ\text{C}$ @ Rated DC Voltage, $T_J = 100^\circ\text{C}$	$I_R$	- -	0.09 7.5	1.0 50	mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle < 2.0%

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## TYPICAL ELECTRICAL CHARACTERISTICS

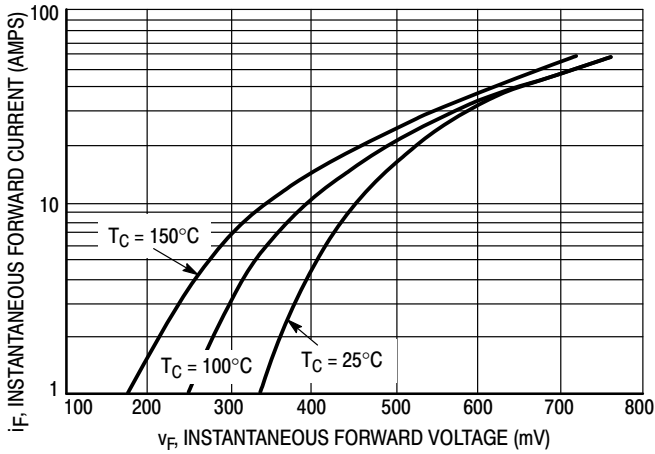


Figure 1. Typical Forward Voltage

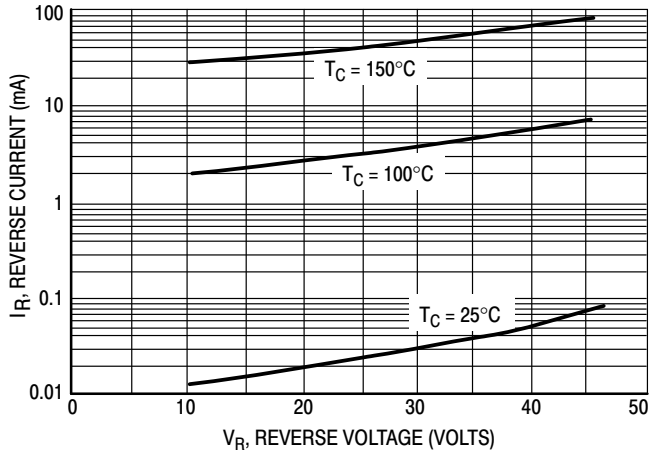


Figure 2. Typical Reverse Current

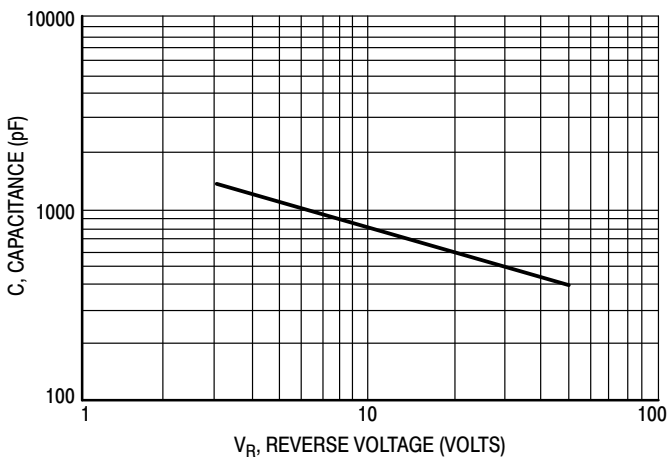


Figure 3. Typical Capacitance Per Leg

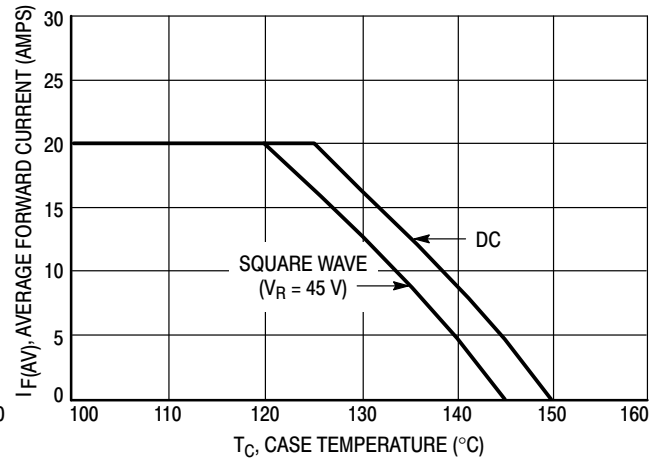
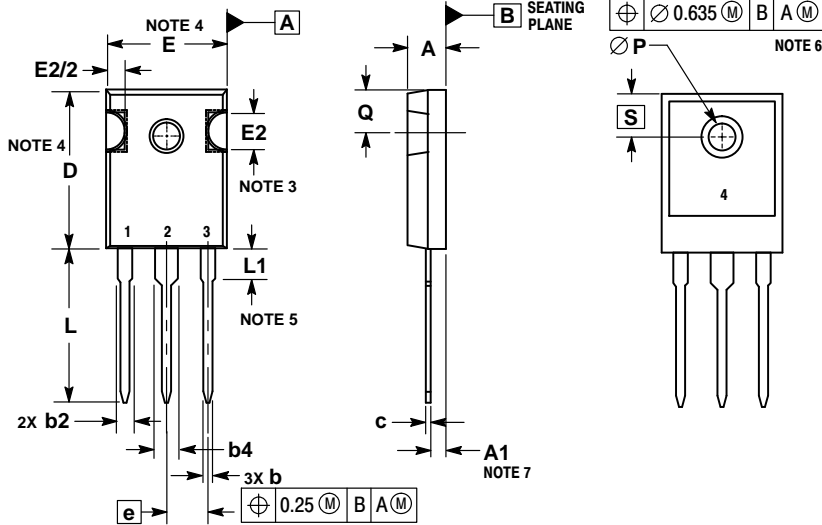


Figure 4. Current Derating Per Leg

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## PACKAGE DIMENSIONS

### TO-247 CASE 340AL ISSUE A



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. SLOT REQUIRED, NOTCH MAY BE ROUNDED.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.
6.  $\varnothing P$  SHALL HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM DIAMETER OF 3.91.
7. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.

DIM	MILLIMETERS	
	MIN	MAX
A	4.70	5.30
A1	2.20	2.60
b	1.00	1.40
b2	1.65	2.35
b4	2.60	3.40
c	0.40	0.80
D	20.30	21.40
E	15.50	16.25
E2	4.32	5.49
e	5.45 BSC	
L	19.80	20.80
L1	3.50	4.50
P	3.55	3.65
Q	5.40	6.20
S	6.15 BSC	

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