

# MBR4045WT

## 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

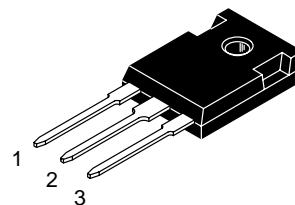
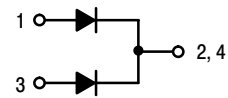
- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 4.3 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine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



**ON Semiconductor®**

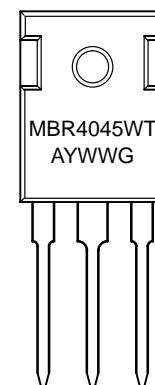
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 40 AMPERES, 45 VOLTS



TO-247AC  
CASE 340L  
STYLE 2

### MARKING DIAGRAM



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

### ORDERING INFORMATION

Device	Package	Shipping
MBR4045WT	TO-247	30 Units/Rail
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.

# MBR4045WT

## 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 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.

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

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

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## TYPICAL ELECTRICAL CHARACTERISTICS

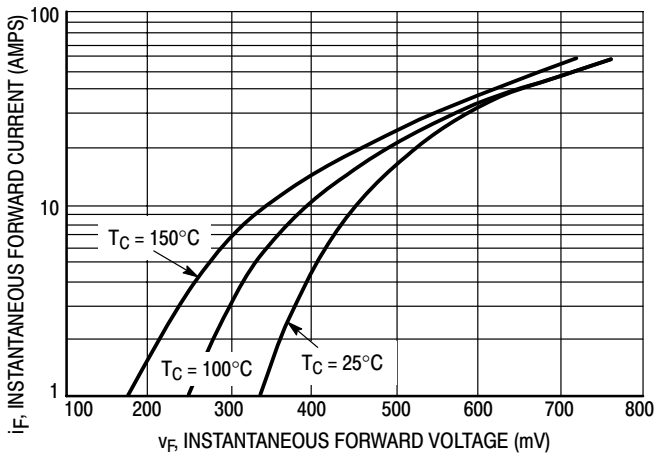


Figure 1. Typical Forward Voltage

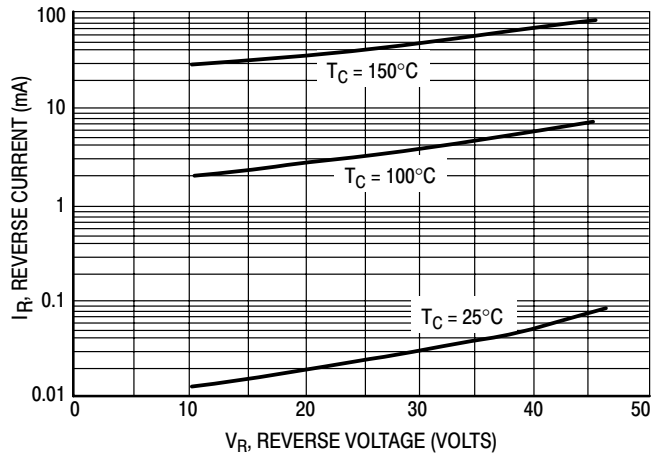


Figure 2. Typical Reverse Current

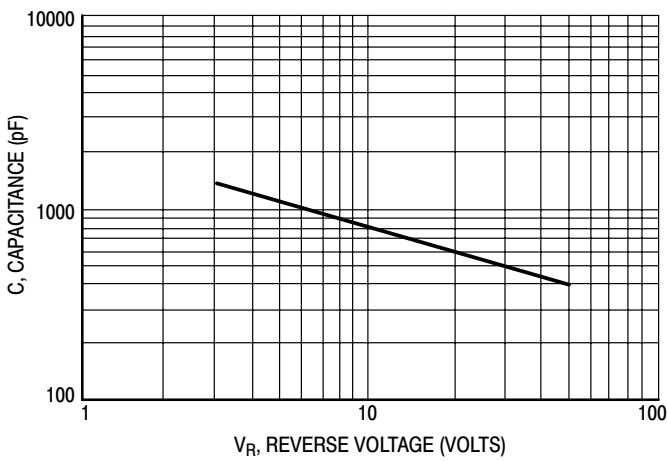


Figure 3. Typical Capacitance Per Leg

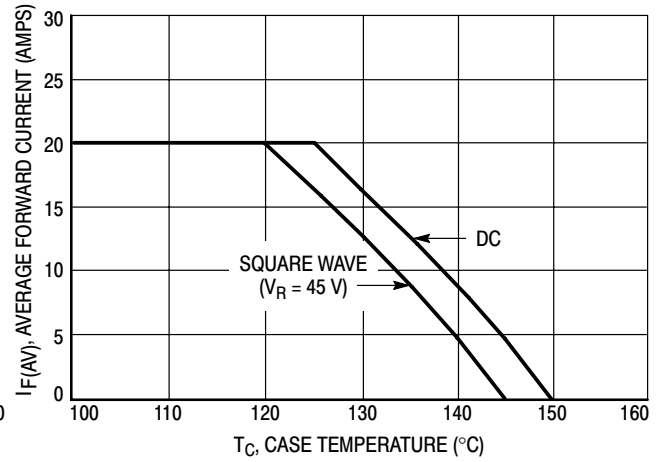
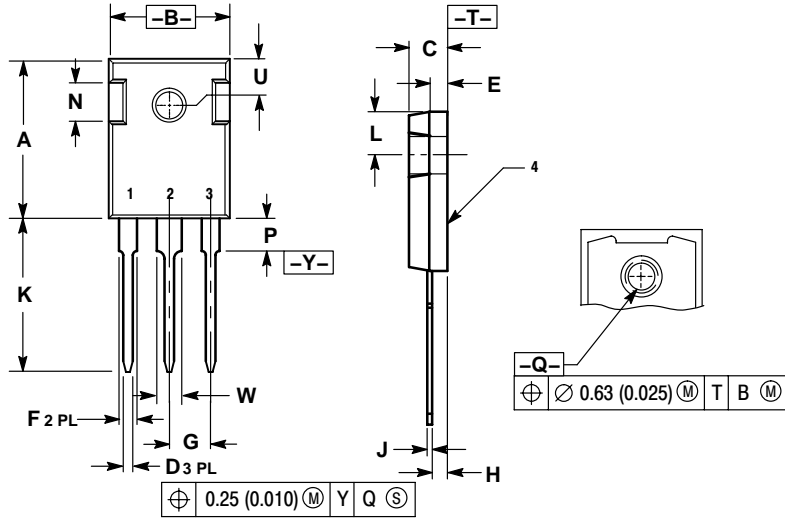


Figure 4. Current Derating Per Leg

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## PACKAGE DIMENSIONS

TO-247 PSI  
PLASTIC  
CASE 340L-02  
ISSUE D



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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.32	21.08	0.800	0.830
B	15.75	16.26	0.620	0.640
C	4.70	5.30	0.185	0.209
D	1.00	1.40	0.040	0.055
E	2.20	2.60	0.087	0.102
F	1.65	2.13	0.065	0.084
G	5.45 BSC		0.215 BSC	
H	1.50	2.49	0.059	0.098
J	0.40	0.80	0.016	0.031
K	20.06	20.83	0.790	0.820
L	5.40	6.20	0.212	0.244
N	4.32	5.49	0.170	0.216
P	---	4.50	---	0.177
Q	3.55	3.65	0.140	0.144
U	6.15 BSC		0.242 BSC	
W	2.87	3.12	0.113	0.123

- STYLE 2:  
PIN 1. ANODE  
2. CATHODE (S)  
3. ANODE 2  
4. CATHODES (S)

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