

# MBRP20045CT

Preferred Device

## POWERTAP™ II SWITCHMODE™ Power Rectifier

This state-of-the-art device uses the Schottky Barrier principle with a platinum barrier metal.

### Features

- Dual Diode Construction; May Be Paralleled for Higher Current Output
- Guardring for Stress Protection
- Low Forward Voltage
- 150°C Operating Junction Temperature
- Guaranteed Reverse Avalanche
- Pb-Free Package is Available\*

### Mechanical Characteristics

- Case: Epoxy, Molded with Metal Heatsink Base
- Weight: 80 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant
- Top Terminal Torque: 25–40 lb-in Max
- Base Plate Torques: See Procedure Given in the Package Outline Section

### MAXIMUM RATINGS

Rating	Symbol	Value	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 $V_R$ , $T_C = 140^\circ\text{C}$ ) Per Leg Per Device	$I_{F(AV)}$	100 200	A
Peak Repetitive Forward Current, (Rated $V_R$ , Square Wave, 20 kHz, $T_C = 140^\circ\text{C}$ ) Per Leg	$I_{FRM}$	200	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	1500	A
Peak Repetitive Reverse Current (2.0 $\mu\text{s}$ , 1.0 kHz) Per Leg	$I_{RRM}$	2.0	A
Storage Temperature Range	$T_{stg}$	-55 to +150	°C
Operating Junction Temperature	$T_J$	-55 to +150	°C
Voltage Rate of Change (Rated $V_R$ )	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.

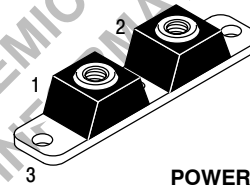
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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### SCHOTTKY BARRIER RECTIFIER 200 AMPERES, 45 VOLTS



POWERTAP II  
CASE 357C  
PLASTIC

### MARKING DIAGRAM



B20045T = Specific Device Code  
MCC = Mold Compound Code  
A = Assembly Location  
YY = Year  
WW = York Week  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MBRP20045CT	POWERTAP II	25 Units/Tray
MBRP20045CTG	POWERTAP II (Pb-Free)	25 Units/Tray

Preferred devices are recommended choices for future use and best overall value.

# MBRP20045CT

## THERMAL CHARACTERISTICS (Per Leg)

Rating	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.6	$^{\circ}\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS (Per Leg)

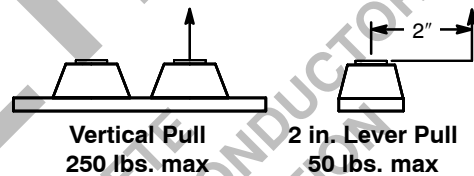
Instantaneous Forward Voltage (Note 1) ( $i_F = 200$ Amps, $T_J = 25^{\circ}\text{C}$ ) ( $i_F = 200$ Amps, $T_J = 125^{\circ}\text{C}$ )	$V_F$	0.89 0.78	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_J = 125^{\circ}\text{C}$ ) (Rated dc Voltage, $T_J = 25^{\circ}\text{C}$ )	$i_R$	50 0.5	mA

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

### MAXIMUM MECHANICAL RATINGS

Terminal Penetration:	0.235 max
Terminal Torque:	25–40 in-lb max
Mounting Torque — Outside Holes:	30–40 in-lb max
Mounting Torque — Center Hole:	8–10 in-lb max
Seating Plane Flatness	1 mil per in. (between mounting holes)

### POWERTAP MECHANICAL DATA APPLIES OVER OPERATING TEMPERATURE



Note: While the POWERTAP is capable of sustaining these vertical and levered tensions, the intimate contact between POWERTAP and heat sink may be lost. This could lead to thermal runaway. The use of very flexible leads is recommended for the anode connections. Use of thermal grease is highly recommended.

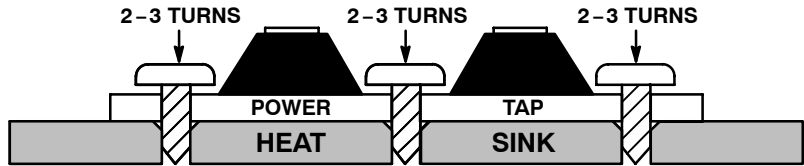
# MBRP20045CT

## MOUNTING PROCEDURE

The POWERTAP package requires special mounting considerations because of the long longitudinal axis of the copper heat sink. It is important to follow the proper tightening sequence to avoid warping the heat sink, which can reduce thermal contact between the POWERTAP and heat sink.

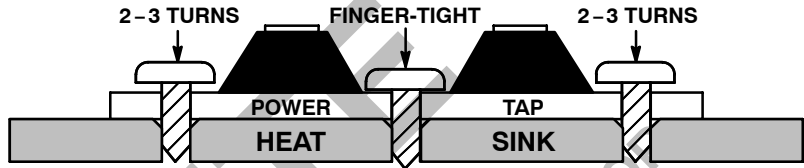
### STEP 1:

Locate the POWERTAP on the heat sink and start mounting bolts into the threads by hand (2 or 3 turns).



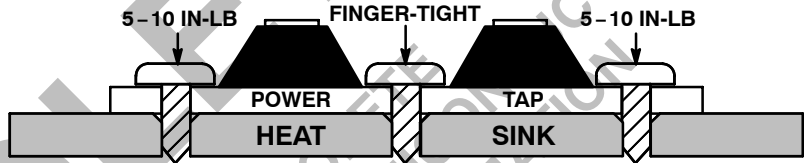
### STEP 2:

Finger tighten the center bolt. The bolt may catch on the threads of the heat sink so it is important to make sure the face of the bolt or washer is in contact with the surface of the POWERTAP.



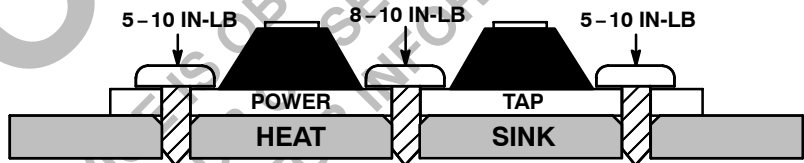
### STEP 3:

Tighten each of the end bolts between 5 to 10 in-lb.



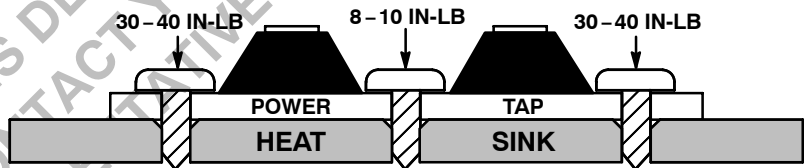
### STEP 4:

Tighten the center bolt between 8 to 10 in-lb.



### STEP 5:

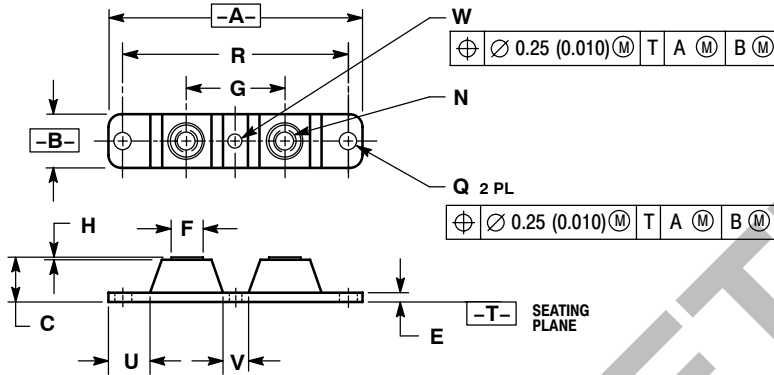
Finally, tighten the end bolts between 30 to 40 in-lb.



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## PACKAGE DIMENSIONS

CASE 357C-03  
 POWERTAP  
 PLASTIC PACKAGE  
 ISSUE E



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. TERMINAL PENETRATION: 5.97 (0.235) MAXIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	3.450	3.635	87.63	92.33
B	0.700	0.810	17.78	20.57
C	0.615	0.640	15.63	16.26
E	0.120	0.130	3.05	3.30
F	0.435	0.445	11.05	11.30
G	1.370	1.380	34.80	35.05
H	0.007	0.030	0.18	0.76
N	1/4-20UNC-2B	1/4-20UNC-2B		
Q	0.270	0.285	6.86	7.23
R	31.50 BSC		80.01 BSC	
U	0.600	0.630	15.24	16.00
V	0.330	0.375	8.39	9.52
W	0.170	0.190	4.32	4.82

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