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MBRP20060CT

POWERTAP II Switch-mode Power Rectifier

These state-of-the-art devices use 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
- 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 | V_{RRM} | 60 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| Average Rectified Forward Current (Rated V_R , $T_C = 140^\circ\text{C}$) | $I_{F(AV)}$ | 100 200 | A |
| | Per Leg Per Device | | |
| Peak Repetitive Forward Current, (Rated V_R , Square Wave, 20 kHz, $T_C = 140^\circ\text{C}$) | I_{FRM} | 200 | A |
| | Per Leg | | |
| 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 μs , 1.0 kHz) | I_{RRM} | 2.0 | A |
| | Per Leg | | |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature | T_J | -55 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10,000 | V/ μs |

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.

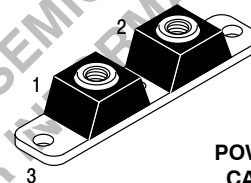
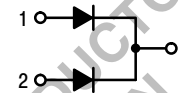
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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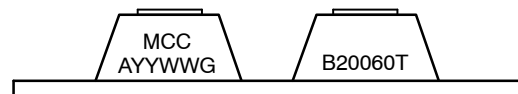
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SCHOTTKY BARRIER RECTIFIER 200 AMPERES, 60 VOLTS



POWERTAP II
CASE 357C
PLASTIC

MARKING DIAGRAM



B20060T = Specific Device Code
MCC = Mold Compound Code
A = Assembly Location
YY = Year
WW = Work Week
G = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping |
|--------------|--------------------------|---------------|
| MBRP20060CT | POWERTAP II | 25 Units/Tray |
| MBRP20060CTG | POWERTAP II (Pb-Free) | 25 Units/Tray |

MBRP20060CT

THERMAL CHARACTERISTICS (Per Leg)

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

ELECTRICAL CHARACTERISTICS (Per Leg)

| | | | |
|---|-------|--------------|----|
| Instantaneous Forward Voltage (Note 1) ($i_F = 200$ Amps, $T_J = 25^{\circ}C$) ($i_F = 200$ Amps, $T_J = 100^{\circ}C$) | V_F | 0.91 0.80 | V |
| Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_J = 125^{\circ}C$) (Rated dc Voltage, $T_J = 25^{\circ}C$) | i_R | 50 0.5 | 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.

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

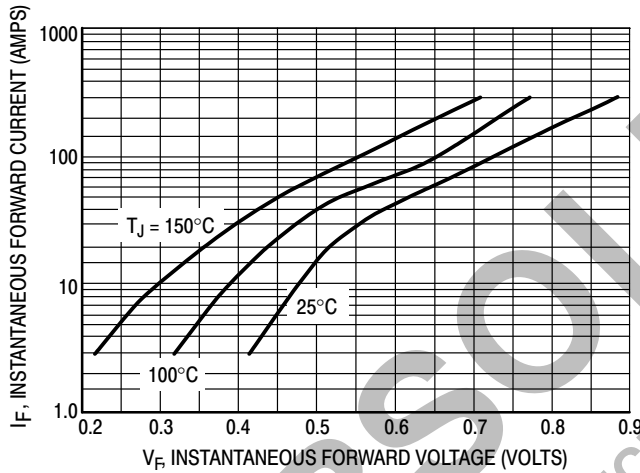


Figure 1. Typical Forward Voltage

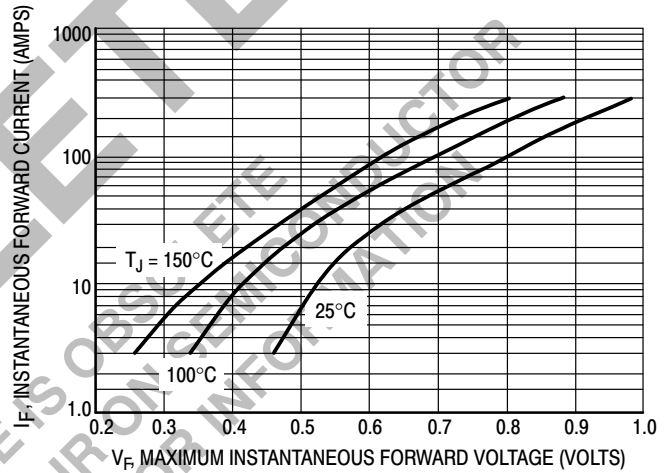


Figure 2. Maximum Forward Voltage

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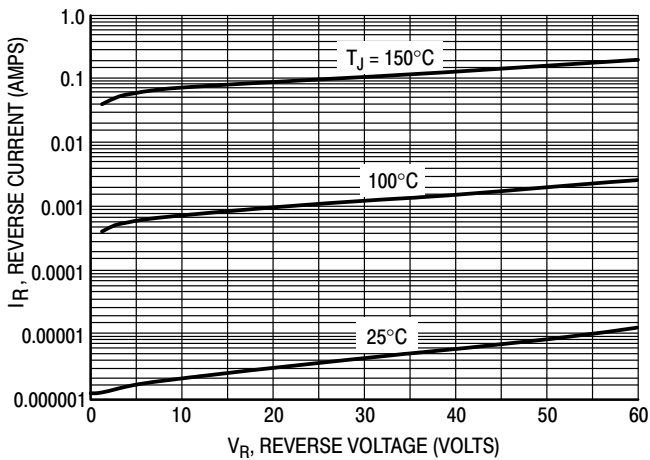


Figure 3. Typical Reverse Current

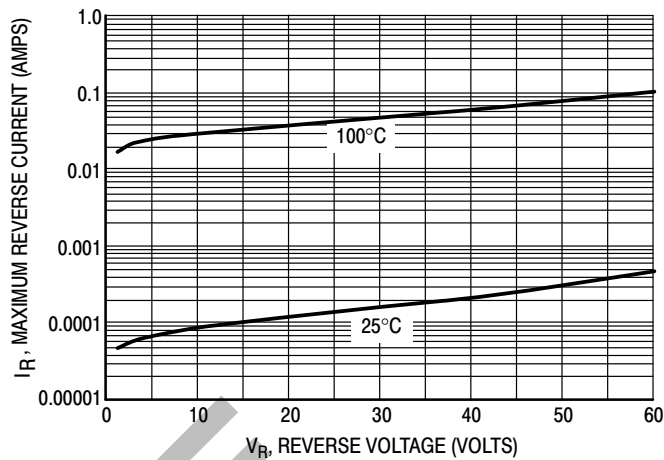


Figure 4. Maximum Reverse Current

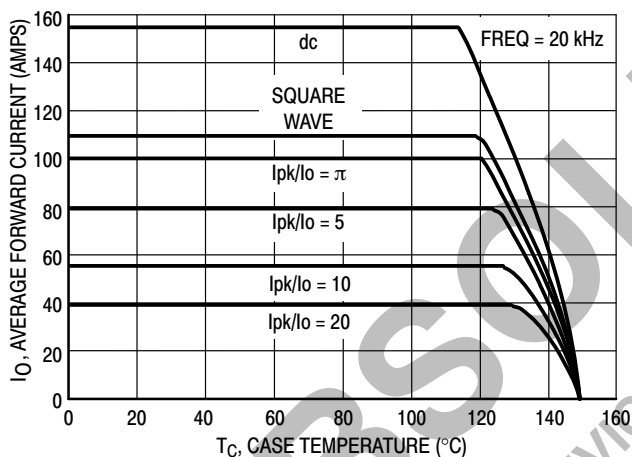


Figure 5. Current Derating (PER LEG)

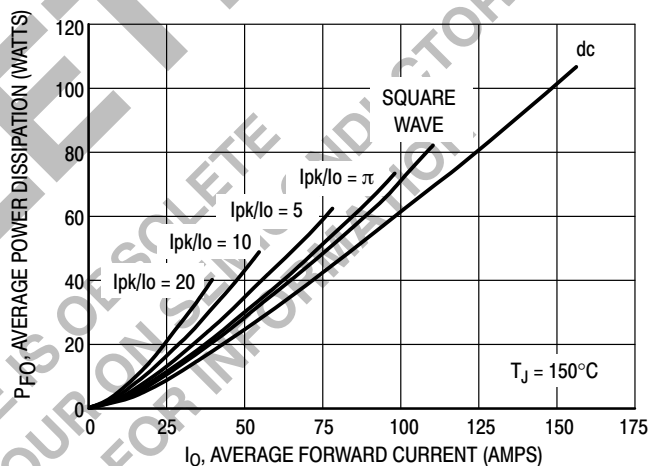


Figure 6. Forward Power Dissipation (PER LEG)

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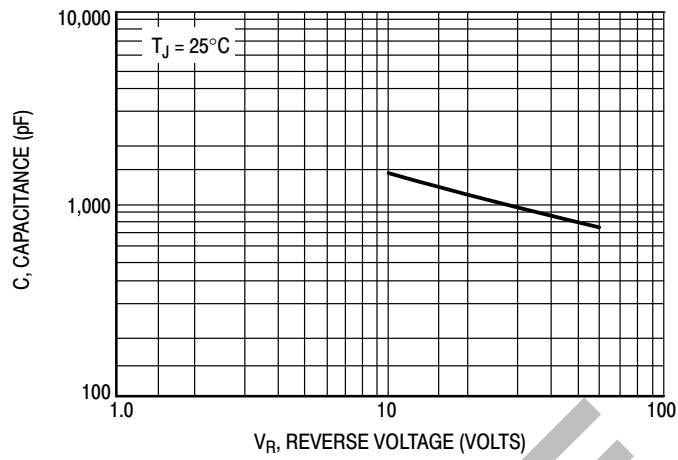


Figure 7. Capacitance

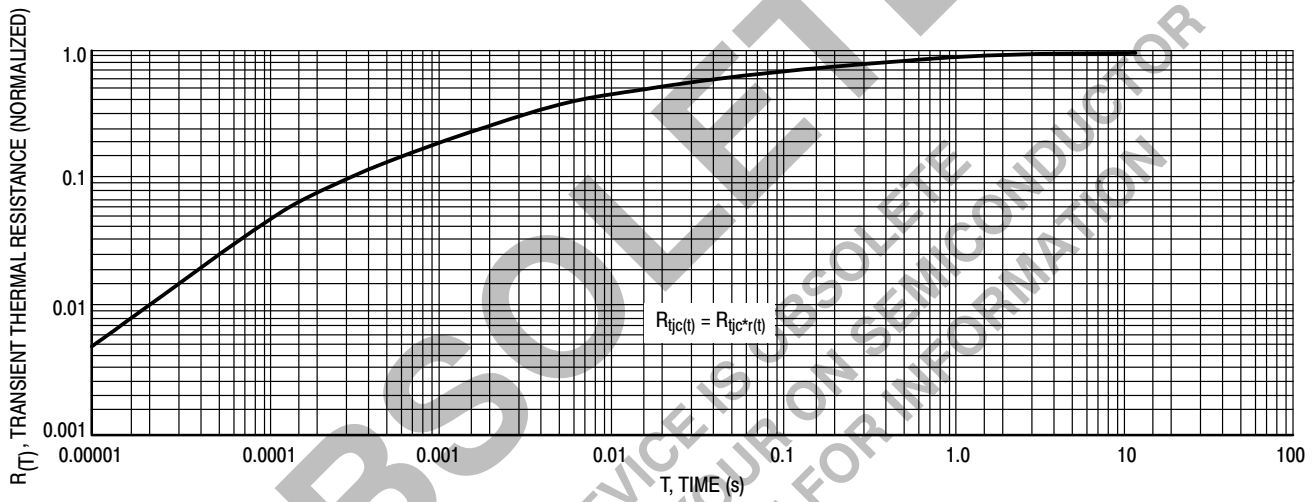


Figure 8. Thermal Response

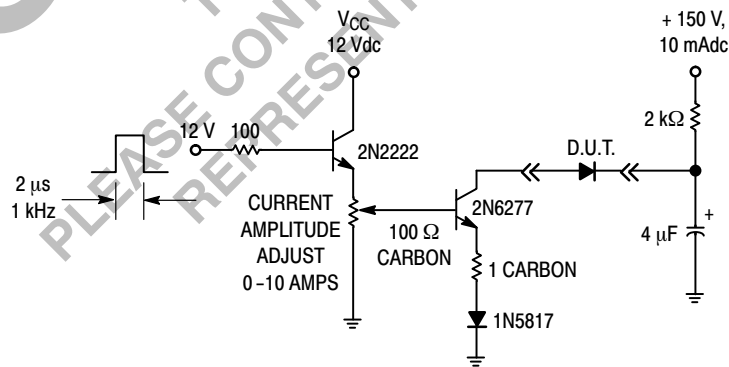


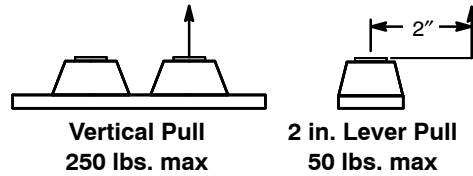
Figure 9. Test Circuit for Repetitive Reverse Current

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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



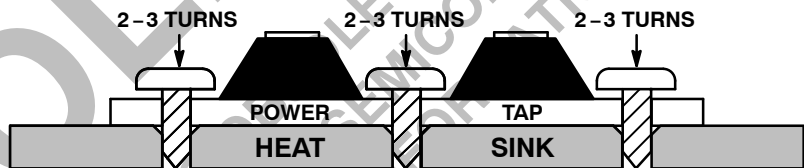
Note: While the POWERTAP is capable of sustaining these vertical and levered tensions, the intimate contact between POWERTAP and heat sink may be lost. This could lead to thermal runaway. The use of very flexible leads is recommended for the anode connections. Use of thermal grease is highly recommended.

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.

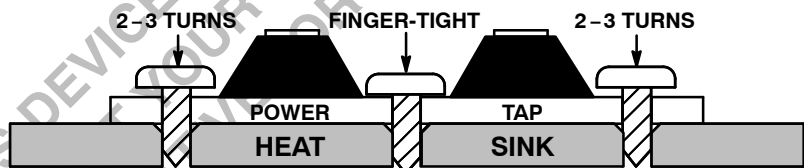
STEP 1:

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



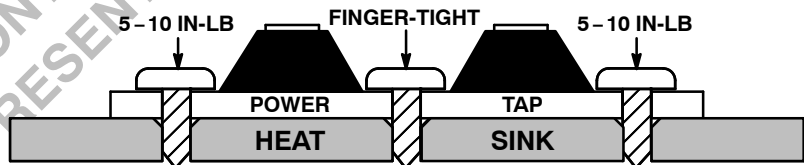
STEP 2:

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.



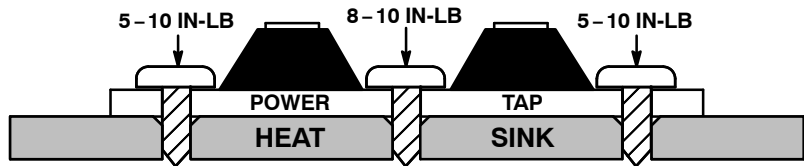
STEP 3:

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



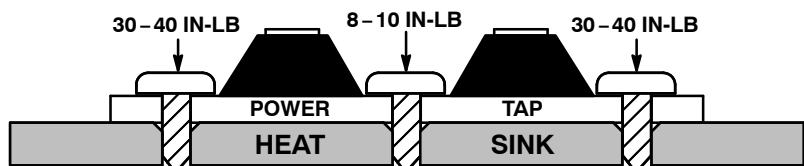
STEP 4:

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



STEP 5:

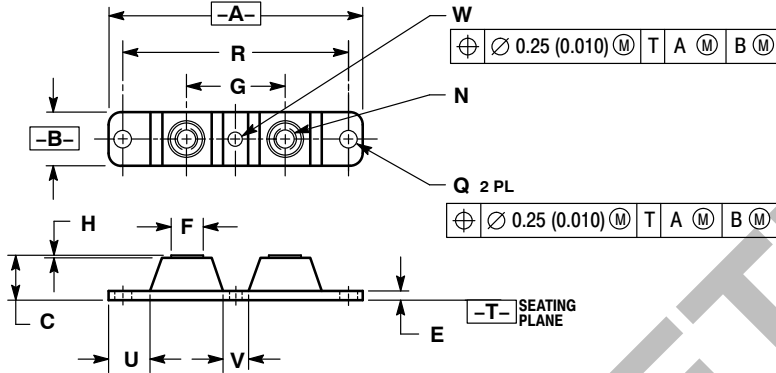
Finally, tighten the end bolts between 30 to 40 in-lb.



MBRP20060CT

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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