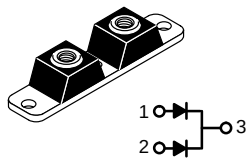
Designer's™ Data Sheet

SWITCHMODE™ Schottky Power Rectifier

POWERTAP™ II Package

MBRP20060CT

SCHOTTKY BARRIER RECTIFIER 200 AMPERES 60 VOLTS



CASE 357C-03
POWERTAP II

. . . employing the Schottky Barrier principle in a large area metal–to–silicon power diode. State of the art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies, free wheeling diode and polarity protection diodes.

- Guardring for Stress Protection
- Matched dual die construction – May be Paralleled for High Current Output
- High dv/dt Capability
- Very Low Forward Voltage Drop

Mechanical Characteristics:

- Case: Epoxy, Molded with Metal Heatsink Base
- Weight: 80 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant
- Base Plate Torques: See procedure given in the Package Outline Section
- Top Terminal Torque: 70 in–lb max.
- Shipped 25 units per foam
- Marking: MBRP20060CT

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage		V_{RRM} V_{RWM} V_R	60	Volts
Average Rectified Forward Current (At Rated V_R, T_C = 120°C)	Per Leg Per Package	I_O	100 200	Amps
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 20 kHz, T_C = 125°C)	Per Leg	I_{FRM}	200	Amps
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	Per Package	I_{FSM}	1500	Amps
Storage/Operating Case Temperature		T_{stg}, T_C	–55 to +150	°C
Operating Junction Temperature		T_J	–55 to +150	°C
Voltage Rate of Change (Rated V_R, T_J = 25°C)		dv/dt	1,000	V/µs

THERMAL CHARACTERISTICS

Thermal Resistance — Junction–to–Case	Per Leg	$R_{\theta jc}$	0.44	°C/W

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1), see Figure 2 (I_F = 100 Amps) (I_F = 200 Amps)	Per Leg	V_F	T_J = 25°C 0.80 0.92	T_J = 100°C 0.72 0.82	Volts
Maximum Instantaneous Reverse Current, see Figure 4 (V_R = 60 V) (V_R = 30 V)	Per Leg	I_R	T_J = 25°C 0.5 0.2	T_J = 100°C 100 50	mA

(1) Pulse Test: Pulse Width ≤ 250 µs, Duty Cycle ≤ 2%.

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MOTOROLA

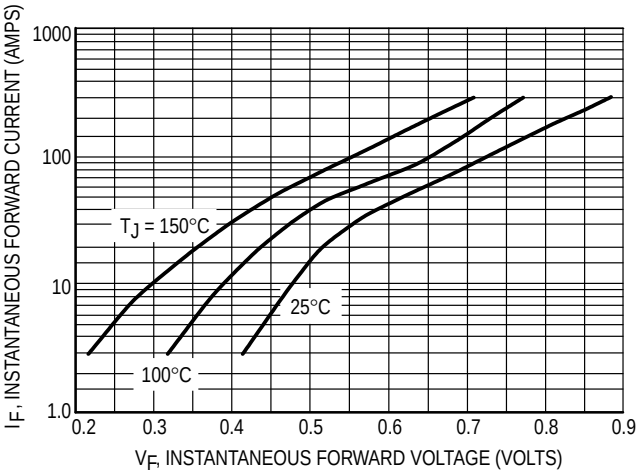


Figure 1. Typical Forward Voltage

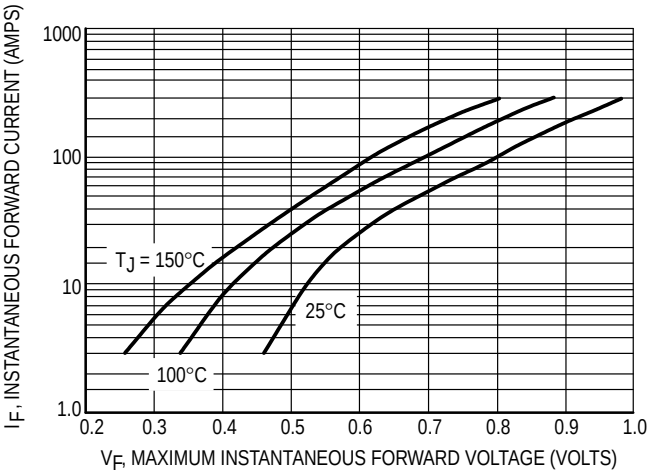


Figure 2. Maximum Forward Voltage

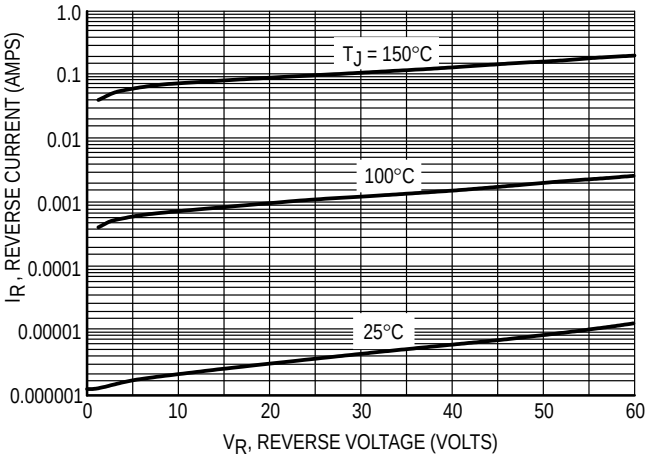


Figure 3. Typical Reverse Current

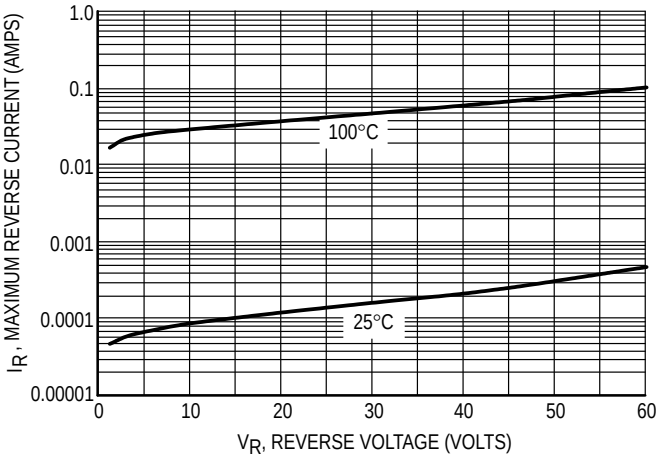


Figure 4. Maximum Reverse Current

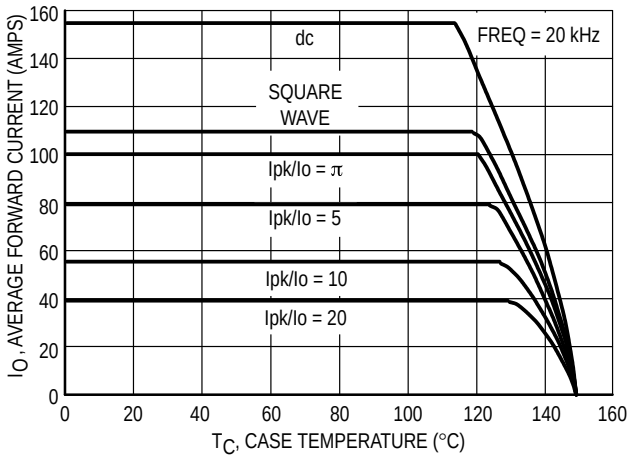


Figure 5. Current Derating (PER LEG)

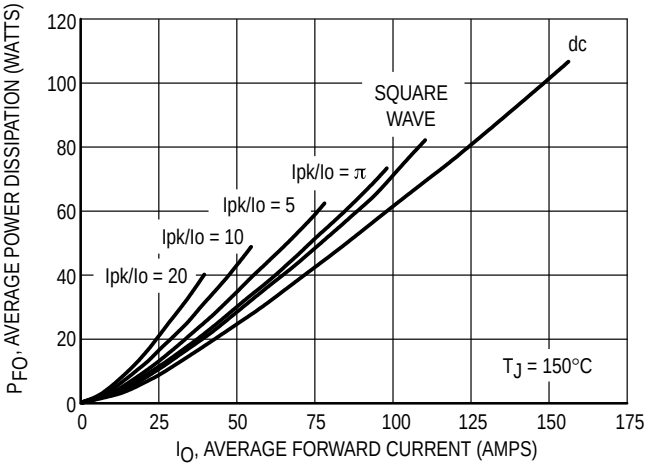


Figure 6. Forward Power Dissipation (PER LEG)

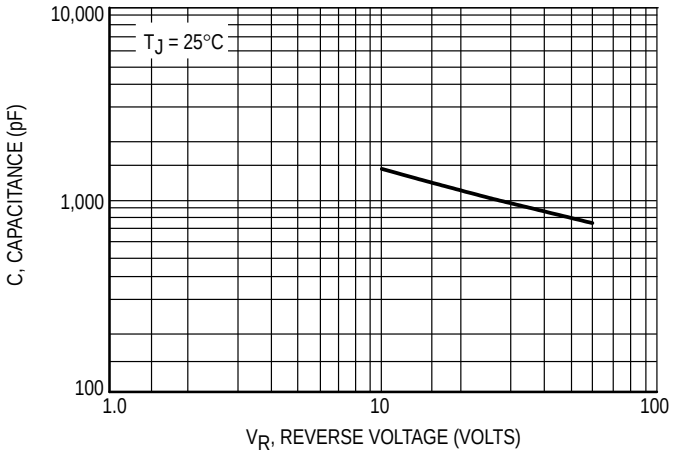


Figure 7. Capacitance

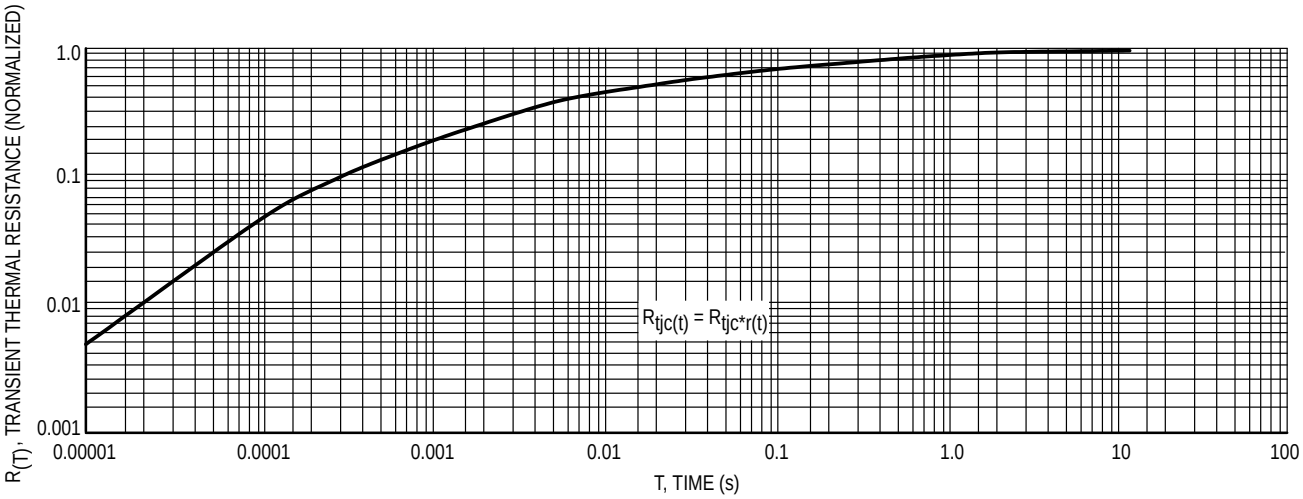


Figure 8. Thermal Response

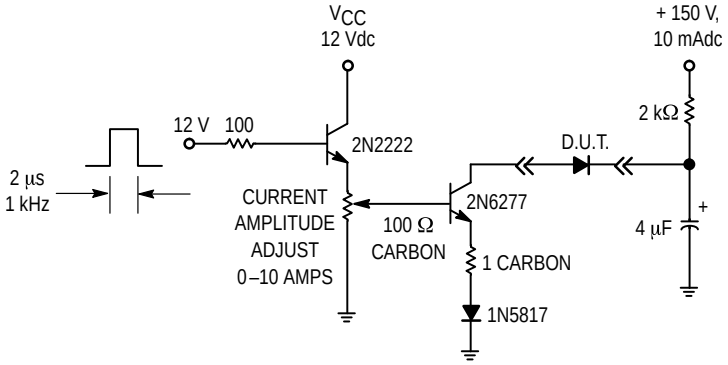
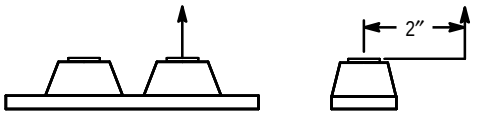


Figure 9. Test Circuit for Repetitive Reverse Current

MAXIMUM MECHANICAL RATINGS

Terminal Penetration:	0.235 max
Terminal Torque:	70 in-lb max
Mounting Torque — Outside Holes:	70 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



Vertical Pull
250 lbs. max

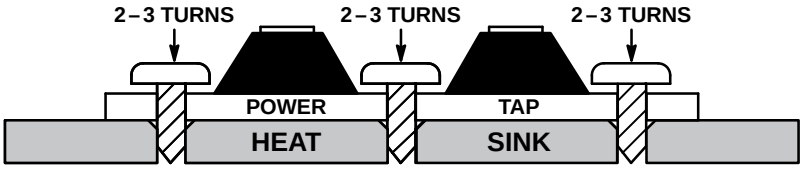
2 in. Lever Pull
50 lbs. max

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.

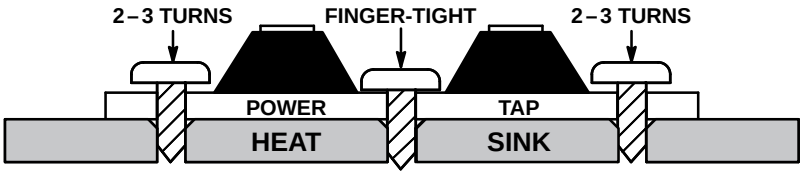
MOUNTING PROCEDURE

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.

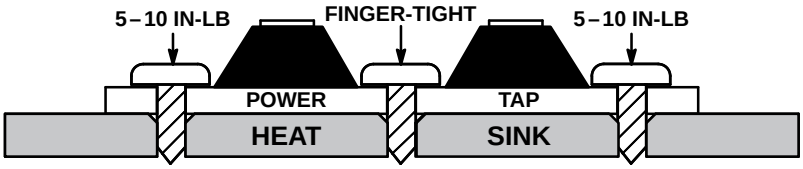
STEP 1:
Locate the POWERTAP on the heat sink and start mounting bolts into the threads by hand (2 or 3 turns).



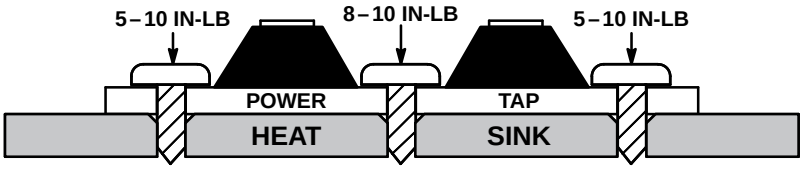
STEP 2:
Finger tighten the center bolt. The bolt may catch on the threads of the heat sink so it is important to make sure the face of the bolt or washer is in contact with the surface of the POWERTAP.



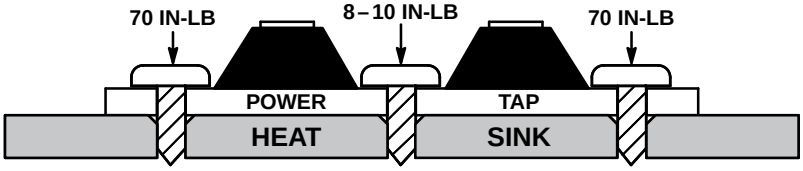
STEP 3:
Tighten each of the end bolts between 5 to 10 in-lb.



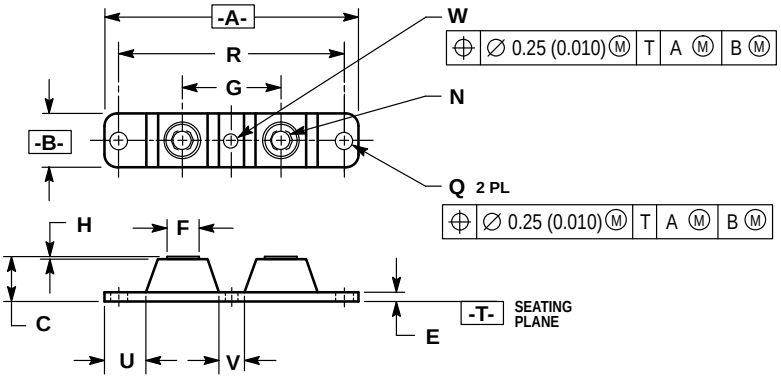
STEP 4:
Tighten the center bolt between 8 to 10 in-lb.



STEP 5:
Finally, tighten the end bolts to 70 in-lb.



PACKAGE DIMENSIONS



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

	INCHES		MILLIMETERS	
DIM	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	15.53	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	7.32
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

CASE 357C–03
ISSUE C

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