

# SWITCHMODE™ Power Rectifiers

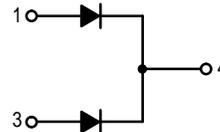
## CPAK Surface Mount Package

... in switching power supplies, inverters and as free wheeling diodes, these state-of-the-art devices have the following features:

- Extremely Fast Switching
- Extremely Low Forward Drop
- Platinum Barrier with Avalanche Guardrings
- Guaranteed Reverse Avalanche

### Mechanical Characteristics:

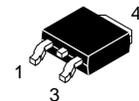
- Case: Epoxy, Molded
- Weight: 0.4 gram (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 75 units per plastic tube
- Available in 16 mm Tape and Reel, 2500 units per reel, by adding a "T4" suffix to the part number
- Marking: B620T, B630T, B640T, B650T, B660T



**MBRD620CT**  
**MBRD630CT**  
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**MBRD650CT**  
**MBRD660CT**

MBRD620CT, MBRD640CT and  
MBRD660CT are  
Motorola Preferred Devices

**SCHOTTKY BARRIER  
RECTIFIERS  
6 AMPERES  
20 TO 60 VOLTS**



**CASE 369A-13  
PLASTIC**

### MAXIMUM RATINGS

Rating	Symbol	MBRD					Unit
		620CT	630CT	640CT	650CT	660CT	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWVM}$ $V_R$	20	30	40	50	60	Volts
Average Rectified Forward Current $T_C = 130^\circ\text{C}$ (Rated $V_R$ )	Per Diode Per Device $I_{F(AV)}$	3 6					Amps
Peak Repetitive Forward Current, $T_C = 130^\circ\text{C}$ (Rated $V_R$ , Square Wave, 20 kHz) Per Diode	$I_{FRM}$	6					Amps
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	75					Amps
Peak Repetitive Reverse Surge Current (2 $\mu\text{s}$ , 1 kHz)	$I_{RRM}$	1					Amp
Operating Junction Temperature	$T_J$	-65 to +150					$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +175					$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10000					$\text{V}/\mu\text{s}$

### THERMAL CHARACTERISTICS PER DIODE

Maximum Thermal Resistance, Junction to Case	$R_{\theta JC}$	6	$^\circ\text{C}/\text{W}$
Maximum Thermal Resistance, Junction to Ambient (1)	$R_{\theta JA}$	80	$^\circ\text{C}/\text{W}$

(1) Rating applies when surface mounted on the minimum pad size recommended.

SWITCHMODE is a trademark of Motorola, Inc.

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



# MBRD620CT MBRD630CT MBRD640CT MBRD650CT MBRD660CT

## ELECTRICAL CHARACTERISTICS PER DIODE

Maximum Instantaneous Forward Voltage (2) $i_F = 3$ Amps, $T_C = 25^\circ\text{C}$ $i_F = 3$ Amps, $T_C = 125^\circ\text{C}$ $i_F = 6$ Amps, $T_C = 25^\circ\text{C}$ $i_F = 6$ Amps, $T_C = 125^\circ\text{C}$	$V_F$	0.7 0.65 0.9 0.85	Volts
Maximum Instantaneous Reverse Current (2) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 125^\circ\text{C}$ )	$i_R$	0.1 15	mA

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

## TYPICAL CHARACTERISTICS

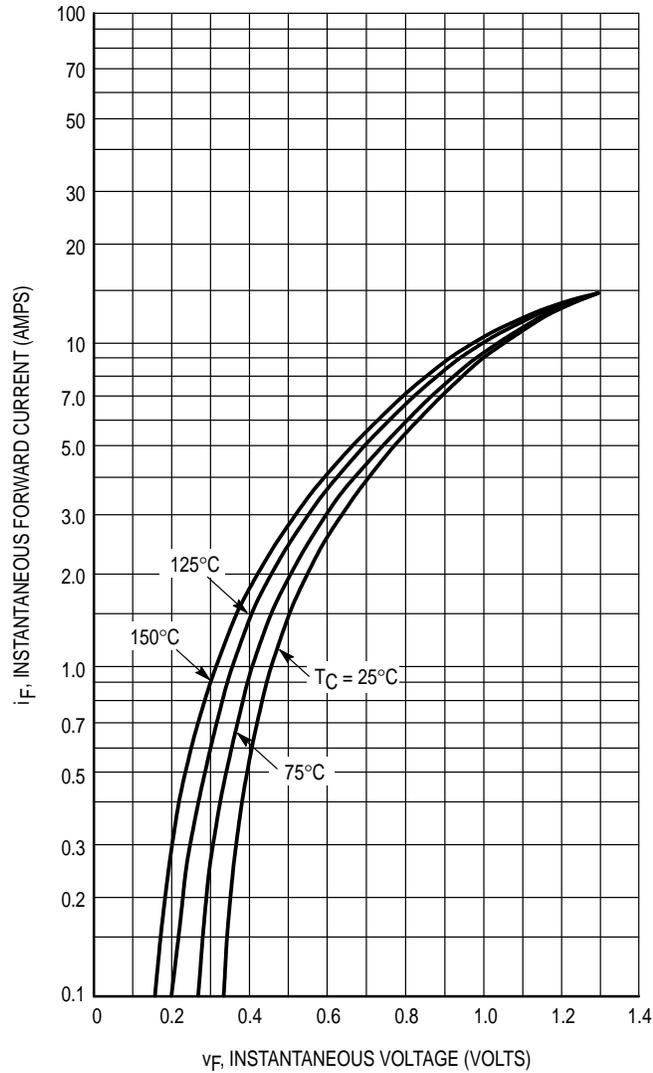
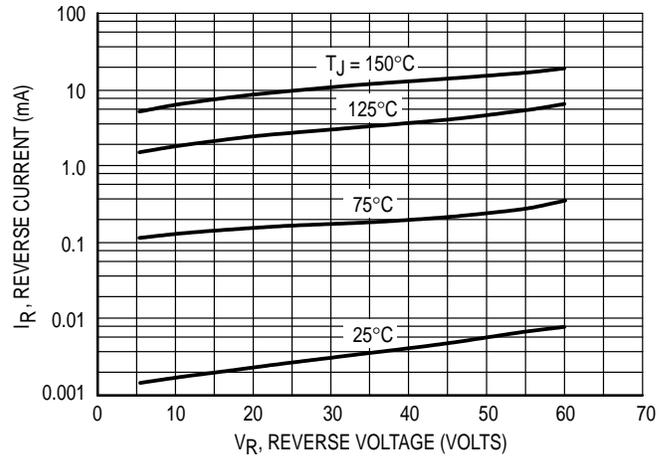


Figure 1. Typical Forward Voltage, Per Leg



\*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these curves if  $V_R$  is sufficient below rated  $V_R$ .

Figure 2. Typical Reverse Current, \* Per Leg

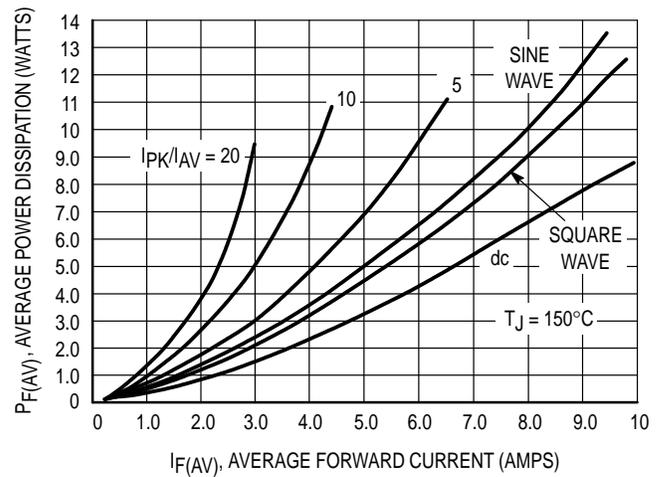
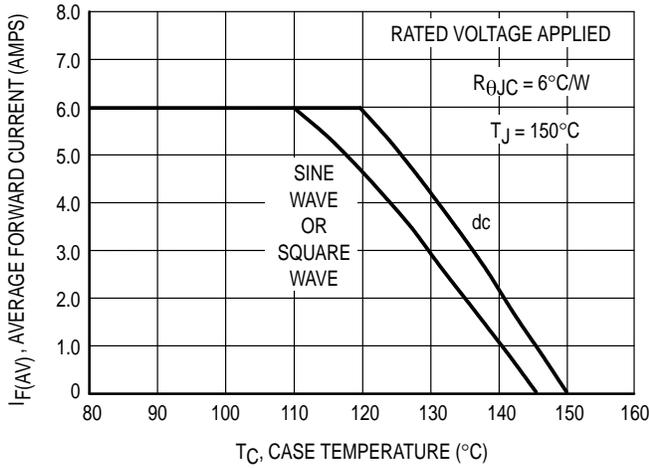
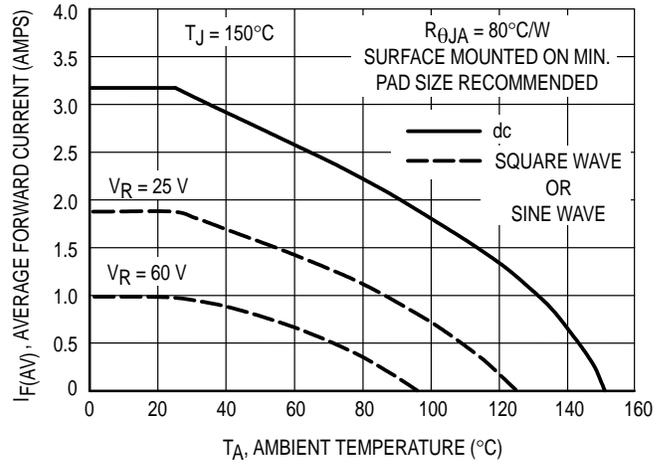


Figure 3. Average Power Dissipation, Per Leg

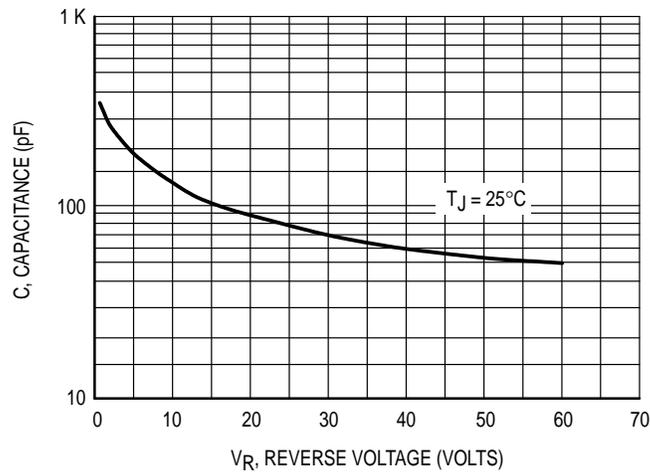
**MBRD620CT MBRD630CT MBRD640CT MBRD650CT MBRD660CT**



**Figure 4. Current Derating, Case, Per Leg**



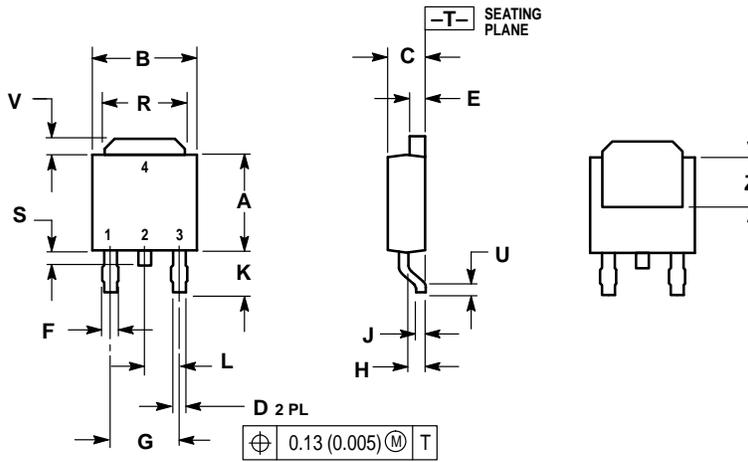
**Figure 5. Current Derating, Ambient, Per Leg**



**Figure 6. Typical Capacitance, Per Leg**

**MBRD620CT MBRD630CT MBRD640CT MBRD650CT MBRD660CT**

**PACKAGE DIMENSIONS**



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	—	0.51	—
V	0.030	0.050	0.77	1.27
Z	0.138	—	3.51	—

**CASE 369A-13  
 ISSUE Y**

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**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
 P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,  
 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
**INTERNET:** http://Design-NET.com

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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