

# MBRD620CT, MBRD630CT, MBRD640CT, MBRD650CT, MBRD660CT

MBRD620CT, MBRD640CT and MBRD660CT are Preferred Devices

## SWITCHMODE Power Rectifiers

### DPAK-3 Surface Mount Package

These state-of-the-art devices are designed for use in switching power supplies, inverters and as free wheeling diodes.

#### Features

- Extremely Fast Switching
- Extremely Low Forward Drop
- Platinum Barrier with Avalanche Guardrings
- Pb-Free Packages are Available

#### Mechanical Characteristics:

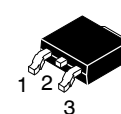
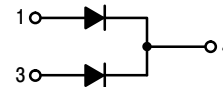
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



ON Semiconductor®

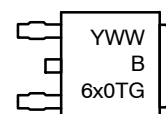
<http://onsemi.com>

### SCHOTTKY BARRIER RECTIFIERS 6.0 AMPERES, 20 – 60 VOLTS



DPAK  
CASE 369C

#### MARKING DIAGRAM



Y	= Year
WW	= Work Week
B6x0T	= Device Code
x	= 2, 3, 4, 5, or 6
G	= Pb-Free Package

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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

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## MAXIMUM RATINGS

Rating	Symbol	MBRD					Unit
		620CT	630CT	640CT	650CT	660CT	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	20	30	40	50	60	V
Average Rectified Forward Current $T_C = 130^\circ\text{C}$ (Rated $V_R$ )	Per Diode Per Device $I_{F(AV)}$	3 6					A
Peak Repetitive Forward Current, $T_C = 130^\circ\text{C}$ (Rated $V_R$ , Square Wave, 20 kHz) Per Diode	$I_{FRM}$	6					A
Nonrepetitive Peak Surge Current – (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	75					A
Peak Repetitive Reverse Surge Current (2 $\mu\text{s}$ , 1 kHz)	$I_{RRM}$	1					A
Operating Junction Temperature (Note 1)	$T_J$	–65 to +175					$^\circ\text{C}$
Storage Temperature	$T_{stg}$	–65 to +175					$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10,000					V/ $\mu\text{s}$

## THERMAL CHARACTERISTICS PER DIODE

Rating	Symbol	Value	Unit
Maximum Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	6	$^\circ\text{C}/\text{W}$
Maximum Thermal Resistance, Junction–to–Ambient (Note 2)	$R_{\theta JA}$	80	$^\circ\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS PER DIODE

Maximum Instantaneous Forward Voltage (Note 3) $i_F = 3$ 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	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 125^\circ\text{C}$ )	$i_R$	0.1 15	mA

1. The heat generated must be less than the thermal conductivity from Junction–to–Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .
2. Rating applies when surface mounted on the minimum pad size recommended.
3. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MBRD620CT, MBRD630CT, MBRD640CT, MBRD650CT, MBRD660CT

## ORDERING INFORMATION

Device	Package	Shipping†
MBRD620CTT4	DPAK	2500 Tape & Reel
MBRD620CTT4G	DPAK (Pb-Free)	2500 Tape & Reel
MBRD630CTT4	DPAK-3	2500 Tape & Reel
MBRD630CTT4G	DPAK (Pb-Free)	2500 Tape & Reel
MBRD640CT	DPAK-3	75 Units / Rail
MBRD640CTG	DPAK-3 (Pb-Free)	75 Units / Rail
MBRD640CTT4	DPAK-3	2500 Tape & Reel
MBRD640CTT4G	DPAK-3 (Pb-Free)	2500 Tape & Reel
MBRD650CT	DPAK-3	75 Units / Rail
MBRD650CTG	DPAK (Pb-Free)	75 Units / Rail
MBRD650CTT4	DPAK-3	2500 Tape & Reel
MBRD650CTT4G	DPAK (Pb-Free)	2500 Tape & Reel
MBRD660CT	DPAK-3	75 Units / Rail
MBRD660CTG	DPAK-3 (Pb-Free)	75 Units / Rail
MBRD660CTRL	DPAK-3	1800 Tape & Reel
MBRD660CTRLG	DPAK-3 (Pb-Free)	1800 Tape & Reel
MBRD660CTT4	DPAK-3	2500 Tape & Reel
MBRD660CTT4G	DPAK-3 (Pb-Free)	2500 Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

TYPICAL CHARACTERISTICS

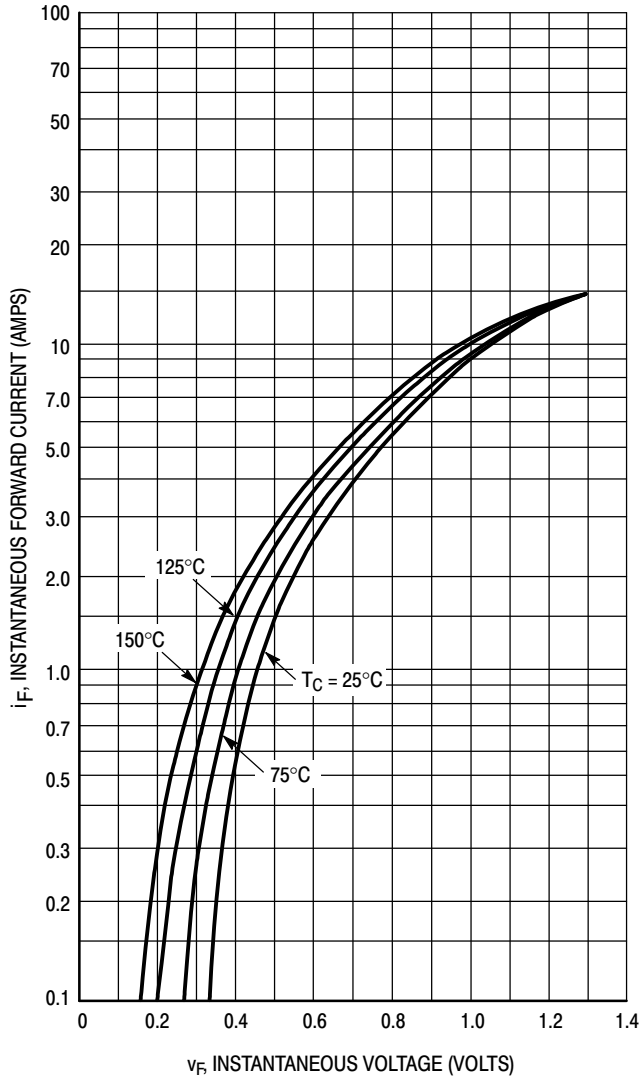
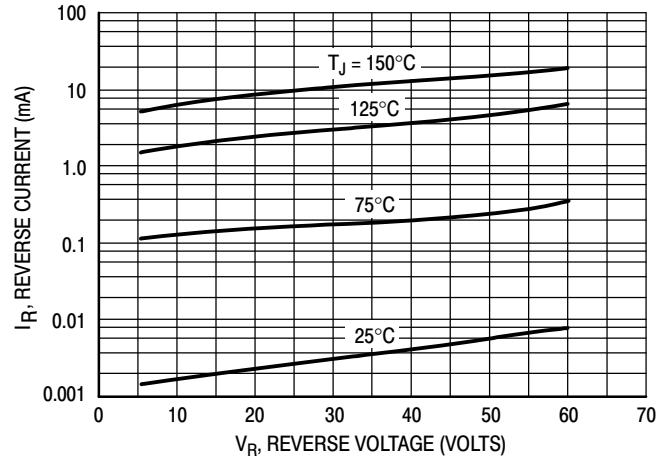


Figure 1. Typical Forward Voltage, Per Leg



\*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

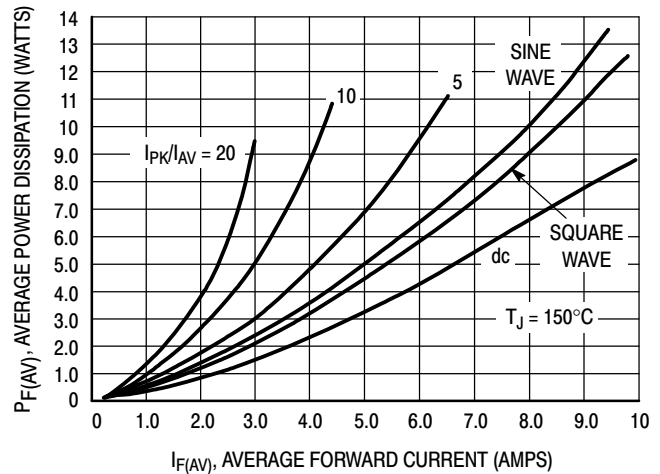
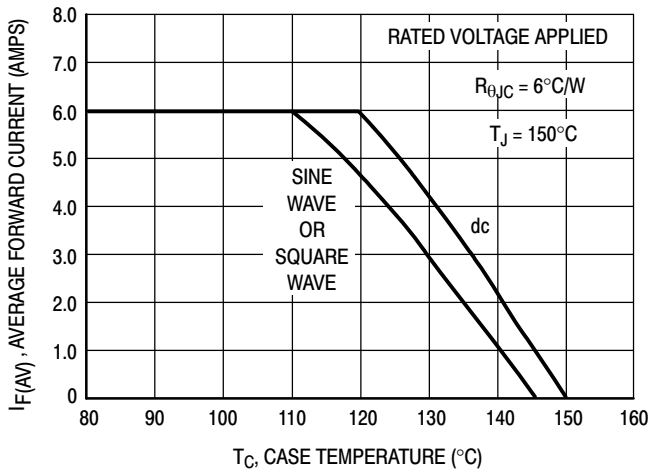
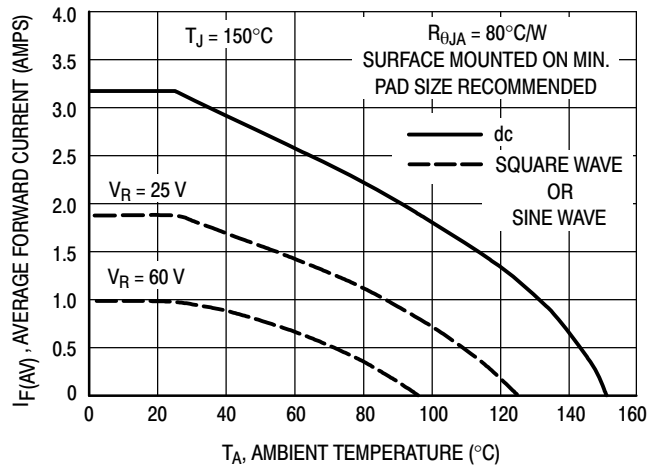


Figure 3. Average Power Dissipation, Per Leg

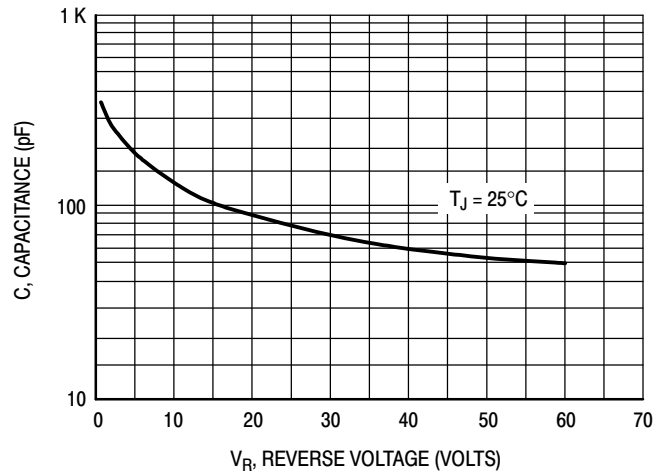
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**Figure 4. Current Derating, Case, Per Leg**



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

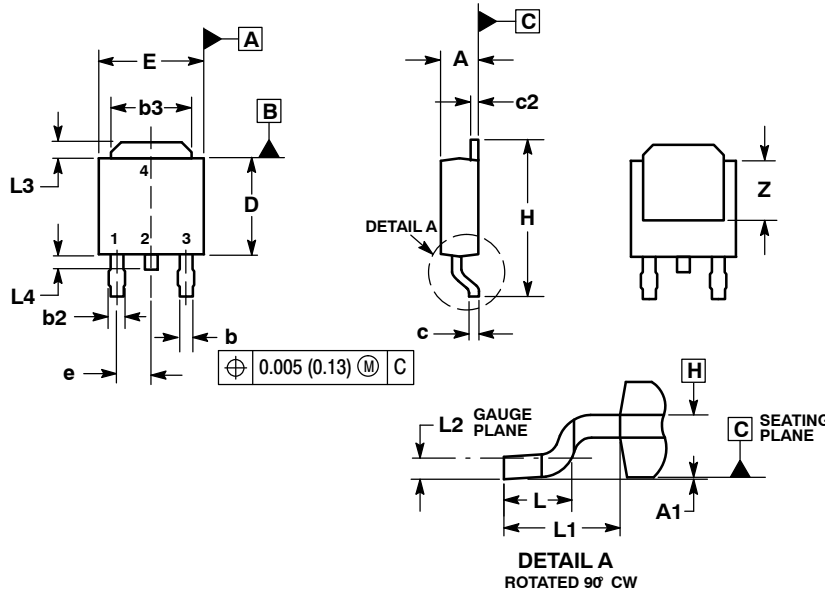


**Figure 6. Typical Capacitance, Per Leg**

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## PACKAGE DIMENSIONS

### DPAK (SINGLE GAUGE) CASE 369C-01 ISSUE D

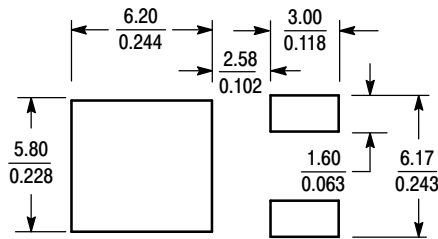


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090 BSC		2.29 BSC	
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020 BSC		0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---

### SOLDERING FOOTPRINT\*



SCALE 3:1 (mm/inches)

\*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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