

# MBRD620CT, MBRD630CT, MBRD640CT, MBRD650CT, MBRD660CT

MBRD620CT, MBRD640CT and MBRD660CT are Preferred Devices

## SWITCHMODE™ Power Rectifiers

### DPAK-3 Surface Mount Package

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

#### Features

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

#### Mechanical Characteristics

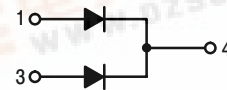
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 75 Units Per Plastic Tube
- Available in 16 mm Tape and Reel, 2500 Units Per Reel, by Adding a "T4" Suffix to the Part Number



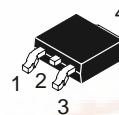
ON Semiconductor®

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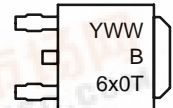
### SCHOTTKY BARRIER RECTIFIERS 6.0 AMPERES, 20 – 60 VOLTS



#### MARKING DIAGRAM



DPAK  
CASE 369C



Y	= Year
WW	= Work Week
x	= 2, 3, 4, 5 or 6

#### 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.



## MBRD620CT, MBRD630CT, MBRD640CT, MBRD650CT, MBRD660CT

### 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 $V_R$ )	$I_{F(AV)}$ Per Diode Per Device	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	$T_J$	–65 to +150					$^\circ\text{C}$
Storage Temperature	$T_{stg}$	–65 to +175					$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10,000					V/ $\mu\text{s}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS PER DIODE

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

### ELECTRICAL CHARACTERISTICS PER DIODE

Maximum Instantaneous Forward Voltage (Note 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	V
Maximum Instantaneous Reverse Current (Note 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

- Rating applies when surface mounted on the minimum pad size recommended.
- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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### ORDERING INFORMATION

Device	Package	Shipping†
MBRD620CTT4	DPAK	2500 Tape & Reel
MBRD620CTT4G	DPAK (Pb-Free)	2500 Tape & Reel
MBRD630CTT4	DPAK-3	2500 Tape & Reel
MBRD640CTT4	DPAK-3	2500 Tape & Reel
MBRD640CTT4G	DPAK-3 (Pb-Free)	2500 Tape & Reel
MBRD650CT	DPAK-3	75 Units / Rail
MBRD650CTT4	DPAK-3	2500 Tape & Reel
MBRD660CT	DPAK-3	75 Units / Rail
MBRD660CTG	DPAK-3 (Pb-Free)	75 Units / Rail
MBRD650CTRL	DPAK-3	1800 Tape & Reel
MBRD650CTRLG	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.

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## TYPICAL CHARACTERISTICS

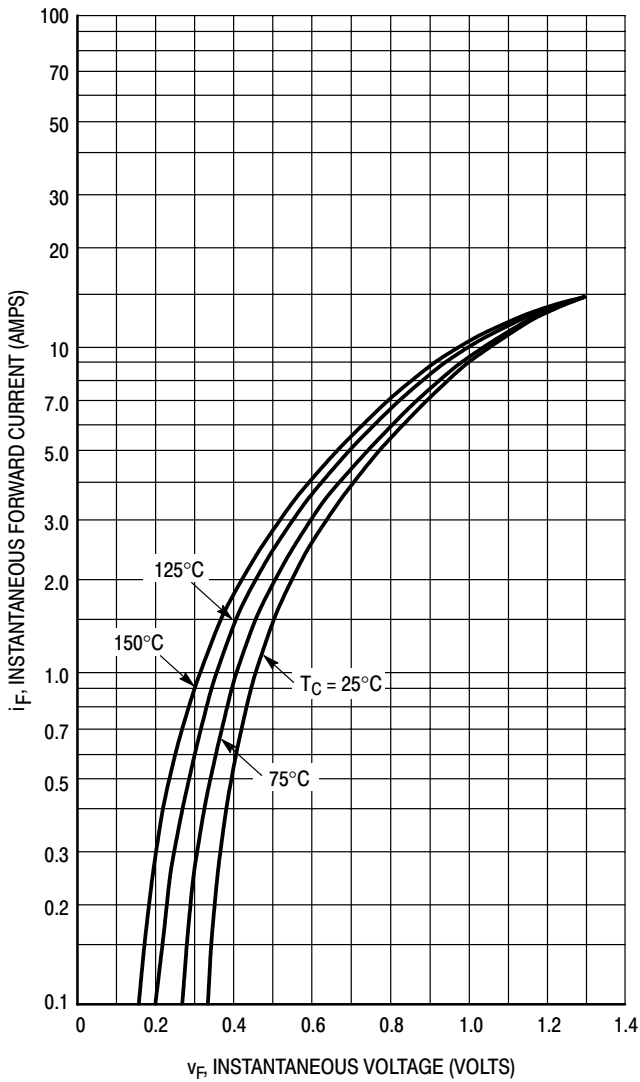
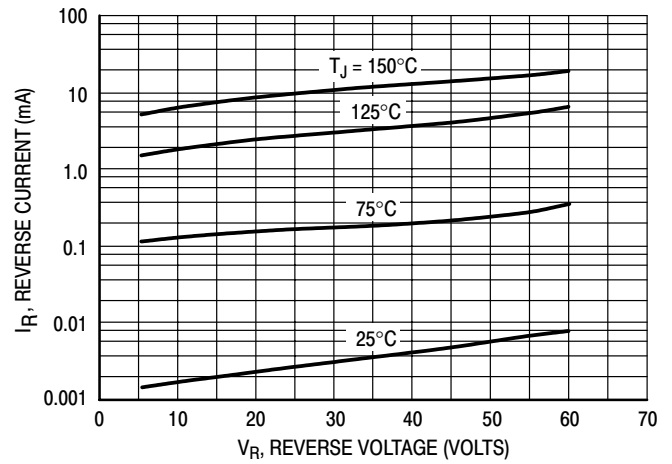


Figure 1. Typical Forward Voltage, Per Leg



\*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

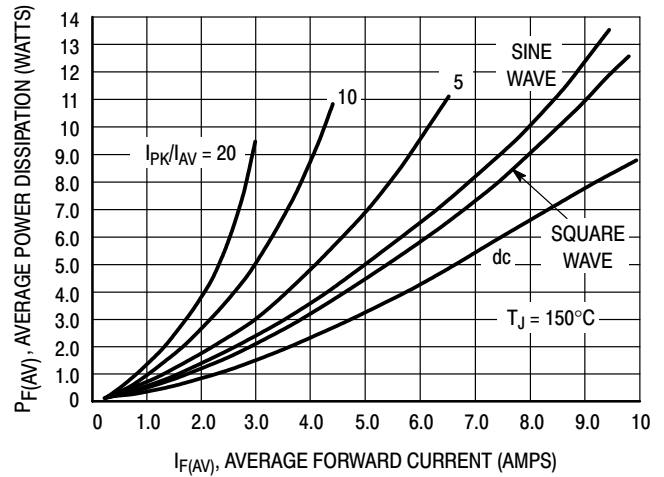


Figure 3. Average Power Dissipation, Per Leg

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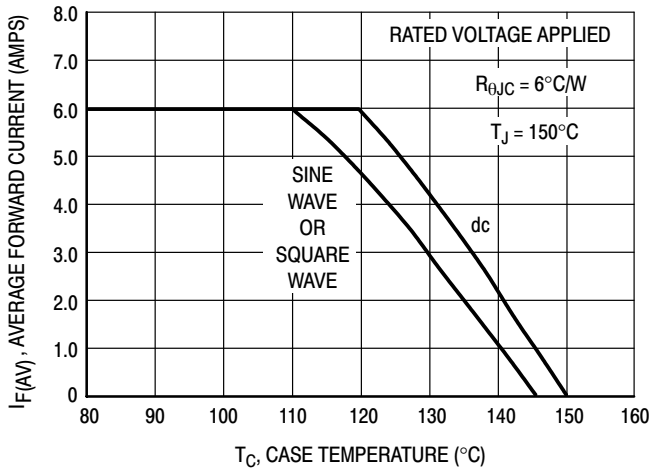


Figure 4. Current Derating, Case, Per Leg

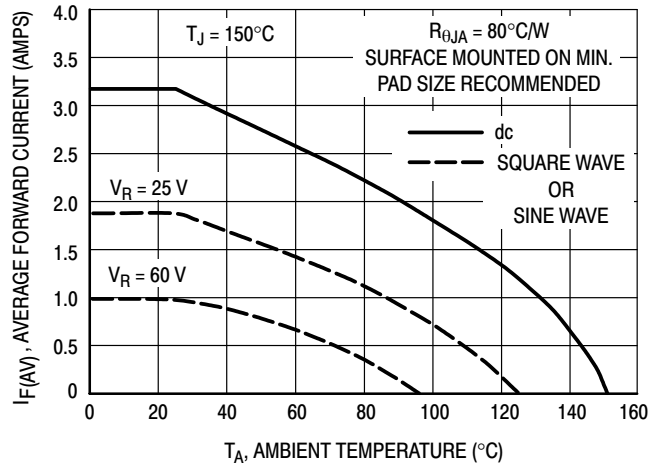


Figure 5. Current Derating, Ambient, Per Leg

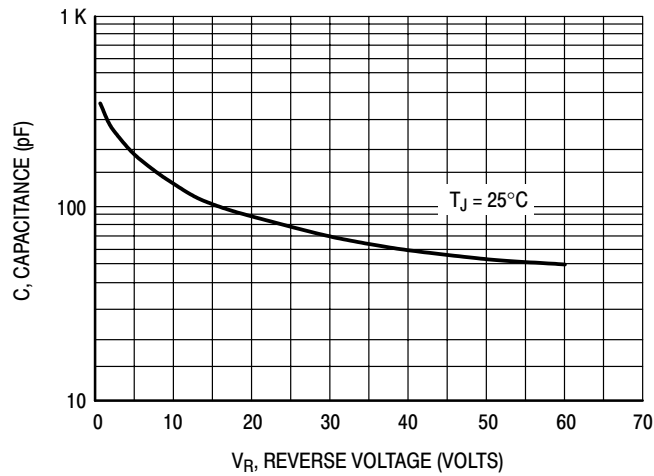
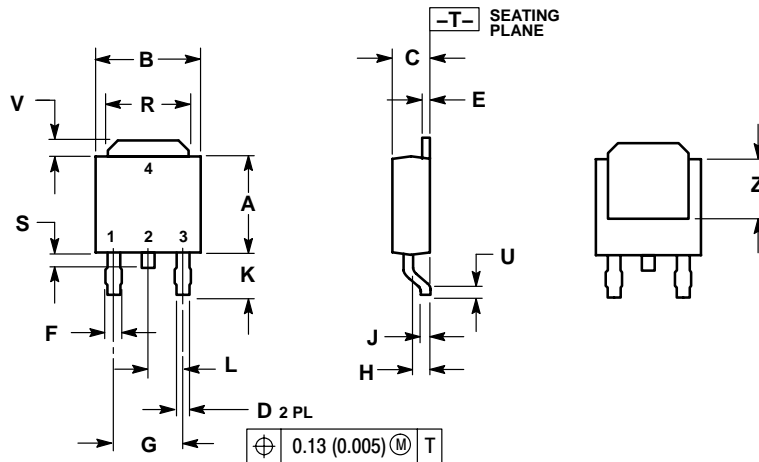


Figure 6. Typical Capacitance, Per Leg

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## PACKAGE DIMENSIONS

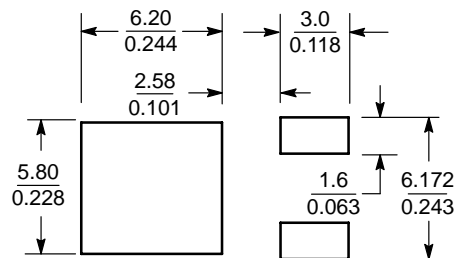
DPAK  
CASE 369C  
ISSUE O



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
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	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
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	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	---	0.51	---
V	0.035	0.050	0.89	1.27
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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