MBRD620CTG Series, NRVBD640CTG Series, SBR640CTT4G Series

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
- AEC−Q101 Qualified and PPAP Capable
- NRVBD and SBR Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb−Free*

Mechanical Characteristics:

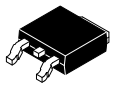
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Ratings:
  - ♦ Machine Model = C
  - ♦ Human Body Model = 3B

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

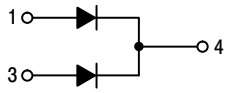
ON Semiconductor®

http://onsemi.com

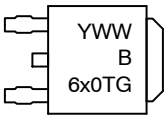
SCHOTTKY BARRIER RECTIFIERS 6.0 AMPERES, 20 – 60 VOLTS



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 5 of this data sheet.

MAXIMUM RATINGS

Rating	Symbol	MBRD/NRVBD/SBR					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°C (Rated V_R) Per Diode Per Device	$I_{F(AV)}$			3 6			A
Peak Repetitive Forward Current, T_C = 130°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 μs, 1 kHz)	I_{RRM}			1			A
Operating Junction Temperature (Note 1)	T_J			–65 to +175			°C
Storage Temperature	T_{stg}			–65 to +175			°C
Voltage Rate of Change (Rated V_R)	dv/dt			10,000			V/μs

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS PER DIODE

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	6	°C/W
Maximum Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	80	°C/W

2. Rating applies when surface mounted on the minimum pad size recommended.

ELECTRICAL CHARACTERISTICS PER DIODE

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 3) i_F = 3 Amps, T_C = 25°C i_F = 3 Amps, T_C = 125°C i_F = 6 Amps, T_C = 25°C i_F = 6 Amps, T_C = 125°C	V_F	 0.7 0.65 0.9 0.85	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, T_C = 25°C) (Rated dc Voltage, T_C = 125°C)	i_R	 0.1 15	mA

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

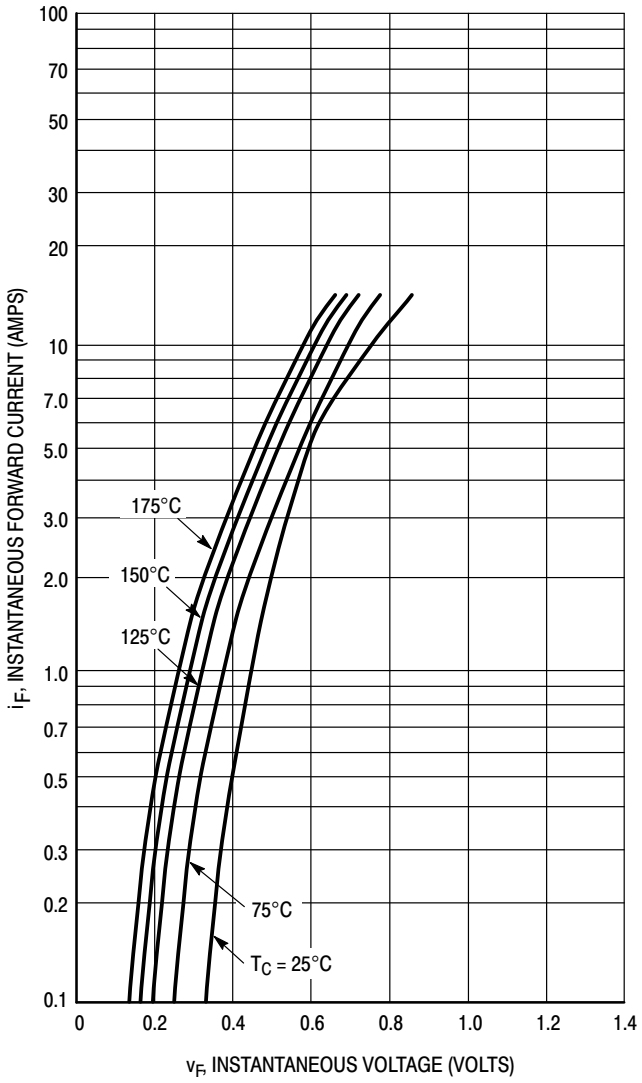
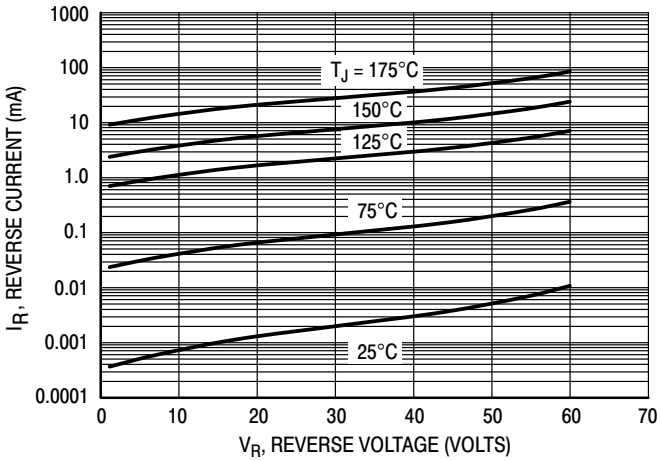


Figure 1. Typical Forward Voltage, Per Leg



*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

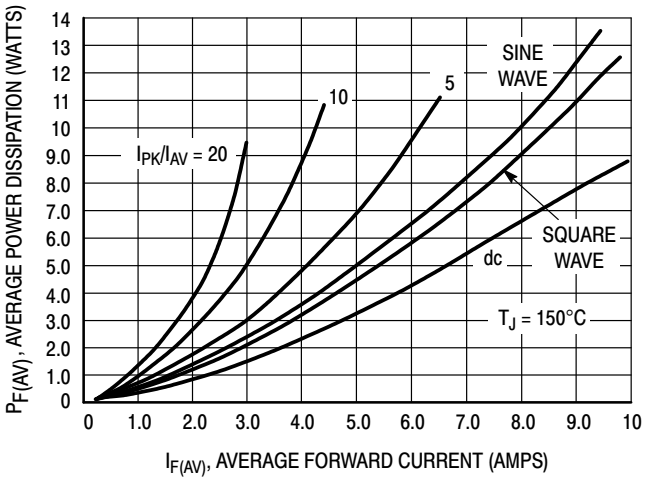


Figure 3. Average Power Dissipation, Per Leg

TYPICAL CHARACTERISTICS

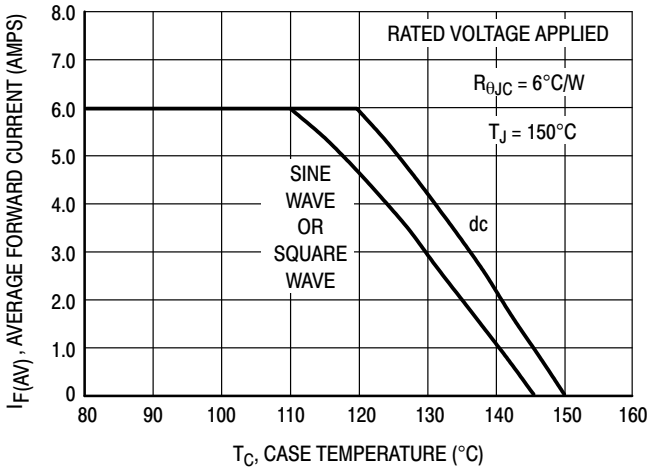


Figure 4. Current Derating, Case, Per Leg

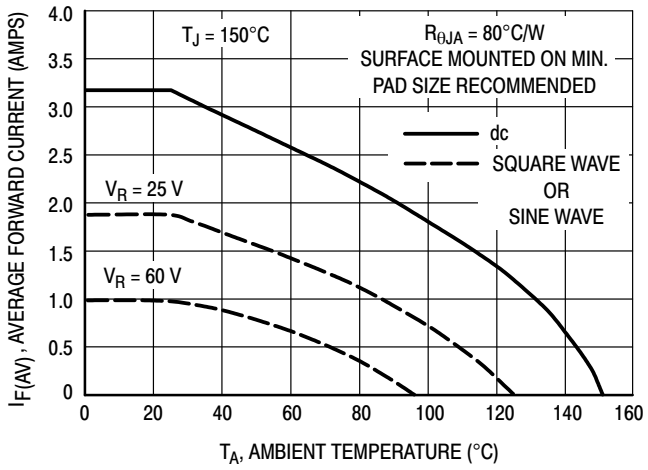


Figure 5. Current Derating, Ambient, Per Leg

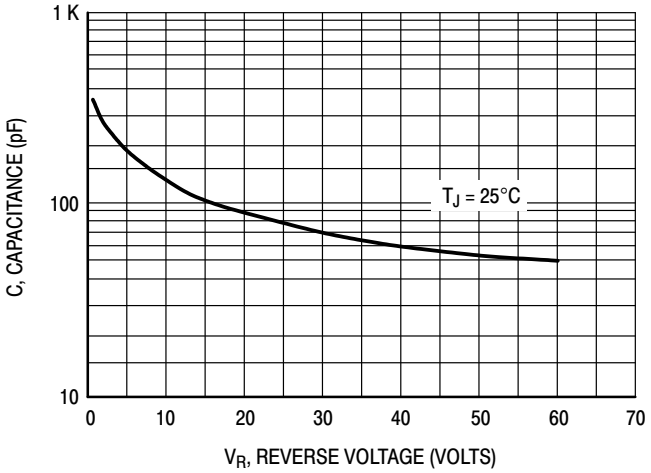


Figure 6. Typical Capacitance, Per Leg

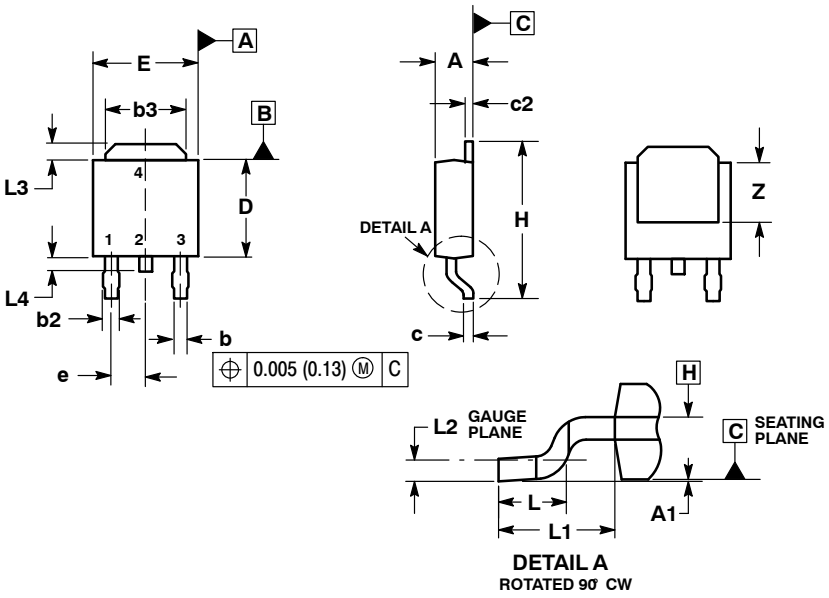
ORDERING INFORMATION

Device	Package	Shipping†
MBRD620CTT4G	DPAK (Pb−Free)	2,500 Tape & Reel
MBRD630CTT4G	DPAK (Pb−Free)	2,500 Tape & Reel
MBRD640CTG	DPAK−3 (Pb−Free)	75 Units / Rail
NRVBD640CTG	DPAK−3 (Pb−Free)	75 Units / Rail
MBRD640CTT4G	DPAK−3 (Pb−Free)	2,500 Tape & Reel
NRVBD640CTT4G	DPAK−3 (Pb−Free)	2,500 Tape & Reel
SBR640CTT4G	DPAK−3 (Pb−Free)	2,500 Tape & Reel
MBRD650CTG	DPAK (Pb−Free)	75 Units / Rail
MBRD650CTT4G	DPAK (Pb−Free)	2,500 Tape & Reel
NRVBD650CTT4G	DPAK (Pb−Free)	2,500 Tape & Reel
MBRD660CTG	DPAK−3 (Pb−Free)	75 Units / Rail
NRVBD660CTG	DPAK−3 (Pb−Free)	75 Units / Rail
MBRD660CTRLG	DPAK−3 (Pb−Free)	1,800 Tape & Reel
MBRD660CTT4G	DPAK−3 (Pb−Free)	2,500 Tape & Reel
NRVBD660CTT4G	DPAK−3 (Pb−Free)	2,500 Tape & Reel
SBR660CTT4G	DPAK−3 (Pb−Free)	2,500 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.

PACKAGE DIMENSIONS

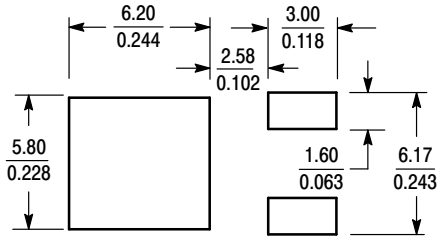
DPAK (SINGLE GAUGE)
CASE 369C−01
ISSUE D



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.

	INCHES		MILLIMETERS	
DIM	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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

MBRD620CT/D