# Switch-mode Power Rectifiers

# **DPAK Surface Mount Package**

These state-of-the-art devices are designed for use as output rectifiers, free wheeling, protection and steering diodes in switching power supplies, inverters and other inductive switching circuits.

#### **Features**

- Extremely Fast Switching
- Extremely Low Forward Drop
- Platinum Barrier with Avalanche Guardrings
- NRVBD and SBRD Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

#### **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



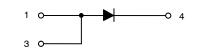
## ON Semiconductor®

www.onsemi.com

# SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 20 – 60 VOLTS



DPAK CASE 369C



#### **MARKING DIAGRAM**



A = Assembly Location\*

Y = Year

WW = Work Week
B3x0 = Device Code
x = 2, 3, 4, 5, or 6
G = Pb-Free Package

\* The Assembly Location Code (A) is front side optional. In cases where the Assembly Location is stamped in the package bottom (molding ejecter pin), the front side assembly code may be blank.

#### **ORDERING INFORMATION**

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

#### **MAXIMUM RATINGS**

Postino a	Symbol	MBRD/SBRD8					11
Rating		320	330	340	350	360	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	20	30	40	50	60	V
Average Rectified Forward Current (T <sub>C</sub> = +125°C, Rated V <sub>R</sub> )	I <sub>F(AV)</sub>	3			Α		
Peak Repetitive Forward Current, T <sub>C</sub> = +125°C (Rated V <sub>R</sub> , Square Wave, 20 kHz)	I <sub>FRM</sub>	6			Α		
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	75			Α		
Peak Repetitive Reverse Surge Current (2 μs, 1 kHz)	I <sub>RRM</sub>	1		Α			
Operating Junction Temperature Range (Note 1)	TJ	−65 to +175		°C			
Storage Temperature Range	T <sub>stg</sub>	-65 to +175		°C			
Voltage Rate of Change (Rated V <sub>R</sub> )	dv/dt	10,000		V/μs			

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

#### THERMAL CHARACTERISTICS

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

<sup>2.</sup> Rating applies when surface mounted on the minimum pad size recommended.

#### **ELECTRICAL CHARACTERISTICS**

Characteristic	Symbol	Value	Unit
$\label{eq:maximum Instantaneous Forward Voltage (Note 3)} \begin{split} &\text{i}_F = 3 \text{ Amps, } T_C = +25^{\circ}\text{C} \\ &\text{i}_F = 3 \text{ Amps, } T_C = +125^{\circ}\text{C} \\ &\text{i}_F = 6 \text{ Amps, } T_C = +25^{\circ}\text{C} \\ &\text{i}_F = 6 \text{ Amps, } T_C = +125^{\circ}\text{C} \end{split}$	V <sub>F</sub>	0.6 0.45 0.7 0.625	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, $T_C = +25^{\circ}C$ ) (Rated dc Voltage, $T_C = +125^{\circ}C$ )	i <sub>R</sub>	0.2 20	mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

<sup>1.</sup> The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{BJA}$ .

<sup>3.</sup> Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

## **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MBRD320G		75 Units / Rail
SBRD8320G*		75 Units / Rail
SBRD8320G-VF01*		75 Units / Rail
MBRD320RLG		1,800 Tape & Reel
MBRD320T4G		2,500 Tape & Reel
SBRD8320T4G*		2,500 Tape & Reel
SBRD8320T4G-VF01*		2,500 Tape & Reel
MBRD330G		75 Units / Rail
SBRD8330G*		75 Units / Rail
SBRD8330G-VF01*		75 Units / Rail
MBRD330RLG		1,800 Tape & Reel
MBRD330T4G		2,500 Tape & Reel
SBRD8330T4G*		2,500 Tape & Reel
SBRD8330T4G-VF01*		2,500 Tape & Reel
MBRD340G		75 Units / Rail
SBRD8340G*		75 Units / Rail
SBRD8340G-VF01*		75 Units / Rail
MBRD340RLG		1,800 Tape & Reel
MBRD340T4G		2,500 Tape & Reel
SBRD8340T4G*	DPAK (Pb-Free)	2,500 Tape & Reel
SBRD8340T4G-VF01*	( 2	2,500 Tape & Reel
MBRD350G		75 Units / Rail
SBRD8350G*		75 Units / Rail
SBRD8350G-VF01*		75 Units / Rail
MBRD350RLG		1,800 Tape & Reel
SBRD8350RLG*		1,800 Tape & Reel
SBRD8350RLG-VF01*		1,800 Tape & Reel
MBRD350T4G		2,500 Tape & Reel
SBRD8350T4G*		2,500 Tape & Reel
SBRD8350T4G-VF01*		2,500 Tape & Reel
MBRD360G		75 Units / Rail
SBRD8360G*		75 Units / Rail
SBRD8360G-VF01*		75 Units / Rail
MBRD360RLG		1,800 Tape & Reel
SBRD8360RLG*		1,800 Tape & Reel
SBRD8360RLG-VF01*	]	1,800 Tape & Reel
MBRD360T4G		2,500 Tape & Reel
NRVBD360VT4G*		2,500 Tape & Reel
SBRD8360T4G*	1	2,500 Tape & Reel

<sup>†</sup>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.

<sup>\*</sup>NRVBD and SBRD Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

#### **TYPICAL CHARACTERISTICS**

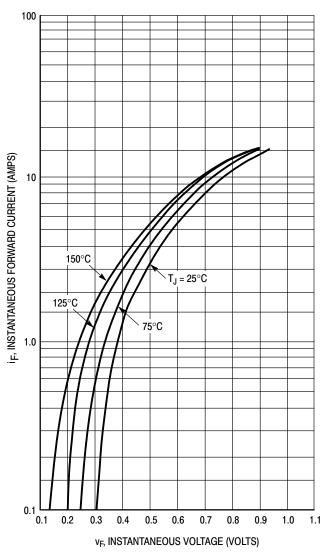
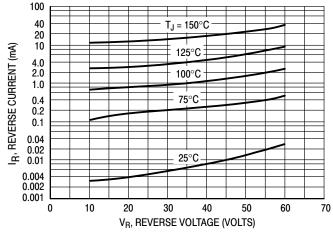


Figure 1. Typical Forward Voltage



\*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** 

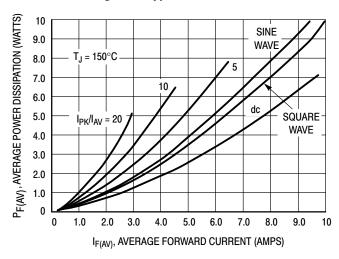


Figure 3. Average Power Dissipation

### **TYPICAL CHARACTERISTICS**

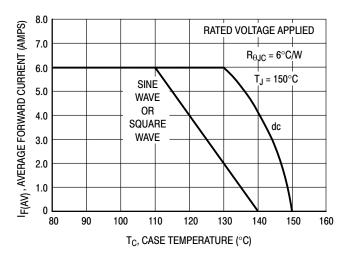


Figure 4. Current Derating, Case

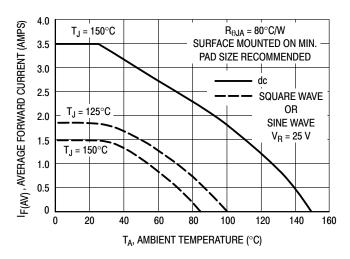


Figure 5. Current Derating, Ambient

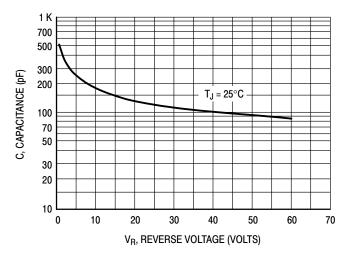
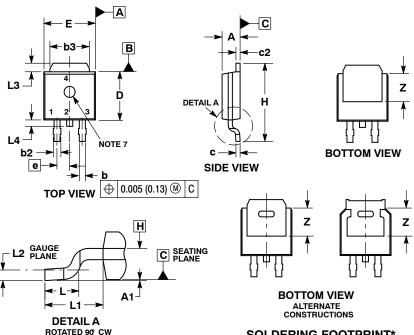


Figure 6. Typical Capacitance

#### PACKAGE DIMENSIONS

## **DPAK (SINGLE GAUGE)**

CASE 369C **ISSUE F** 



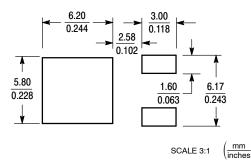
- OTLS.

  1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.

  2. CONTROLLING DIMENSION: INCHES.
- 3. THERMAL PAD CONTOUR OPTIONAL WITHIN DI-
- MENSIONS 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
- 7. OPTIONAL MOLD FEATURE.

	INC	HES	MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	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	0.028	0.045	0.72	1.14	
b3	0.180	0.215	4.57	5.46	
С	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	
Е	0.250	0.265	6.35	6.73	
е	0.090	BSC	2.29 BSC		
Н	0.370	0.410	9.40	10.41	
L	0.055	0.070	1.40	1.78	
L1	0.114	REF	2.90 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\***



\*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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