

# MBRD5H100T4G, NBRD5H100T4G

## SWITCHMODE Schottky Power Rectifier

### Surface Mount Power Package

This series of Power Rectifiers employs the Schottky Barrier principle in a large metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for use in low voltage, high frequency switching power supplies, free wheeling diodes, and polarity protection diodes.

#### Features

- Guardring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Short Heat Sink Tab Manufactured – Not Sheared!
- NBRD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- All Packages are Pb-Free\*

#### Mechanical Characteristics:

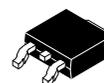
- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 0.4 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL1 Requirements
- ESD Ratings:
  - ◆ Machine Model = C (> 400 V)
  - ◆ Human Body Model = 3B (> 8000 V)



ON Semiconductor®

<http://onsemi.com>

### SCHOTTKY BARRIER RECTIFIER 5 AMPERES, 100 VOLTS

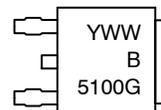


DPAK  
CASE 369C



(Pin 1: No Connect)

#### MARKING DIAGRAM



Y = Year  
WW = Work Week  
B5100 = Device Code  
G = Pb-Free Package

#### ORDERING INFORMATION

Device	Package	Shipping†
MBRD5H100T4G	DPAK (Pb-Free)	2,500 / Tape & Reel
NBRD5H100T4G	DPAK (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.

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

# MBRD5H100T4G, NBRD5H100T4G

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	100	V
Average Rectified Forward Current (Rated $V_R$ ) $T_C = 171^\circ\text{C}$	$I_{F(AV)}$	5	A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz) $T_C = 171^\circ\text{C}$	$I_{FRM}$	10	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	105	A
Operating Junction and Storage Temperature Range (Note 1)	$T_J, T_{stg}$	-65 to +175	$^\circ\text{C}$

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

Characteristic	Symbol	Value	Unit
Thermal Resistance Junction-to-Case (Note 2) Junction-to-Ambient (Note 2)	$R_{\theta JC}$ $R_{\theta JA}$	1.6 95.8	$^\circ\text{C}/\text{W}$

2. When mounted using minimum recommended pad size on FR-4 board.

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 3) ( $I_F = 5\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $I_F = 5\text{ A}$ , $T_J = 125^\circ\text{C}$ )	$V_F$	0.71 0.60	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, $T_J = 125^\circ\text{C}$ ) (Rated dc Voltage, $T_J = 25^\circ\text{C}$ )	$I_R$	4.5 3.5	mA $\mu\text{A}$

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

# MBRD5H100T4G, NBRD5H100T4G

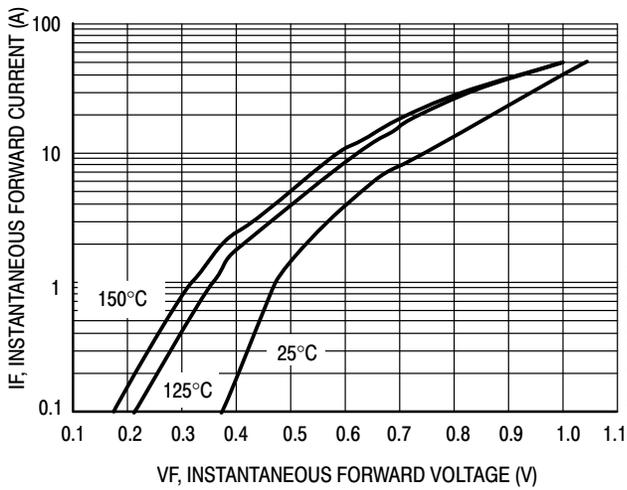


Figure 1. Typical Forward Voltage

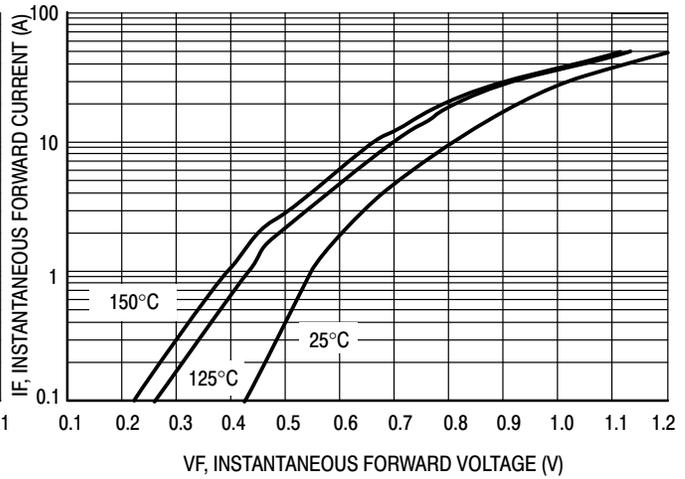


Figure 2. Maximum Forward Voltage

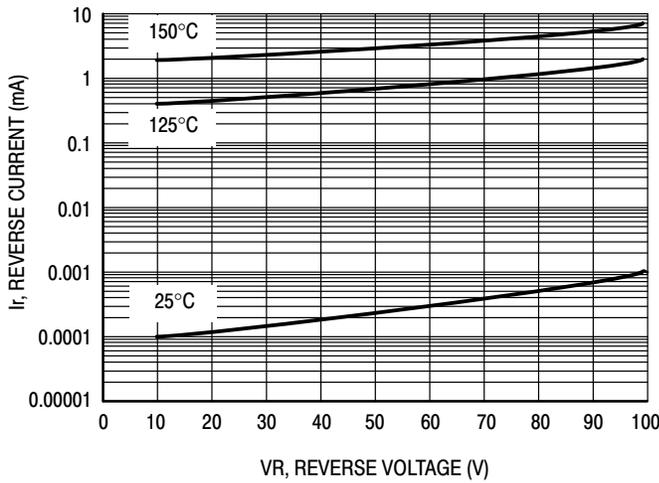


Figure 3. Typical Reverse Current

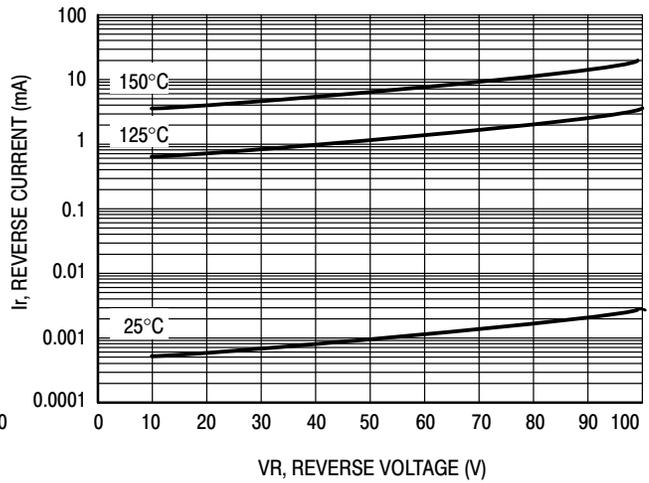


Figure 4. Maximum Reverse Current

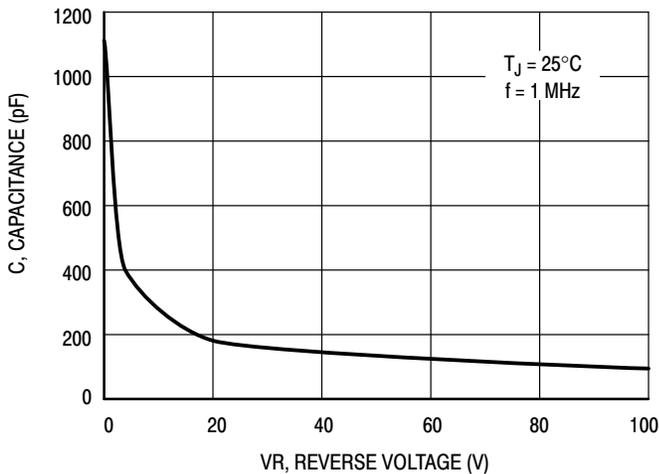


Figure 5. Typical Capacitance

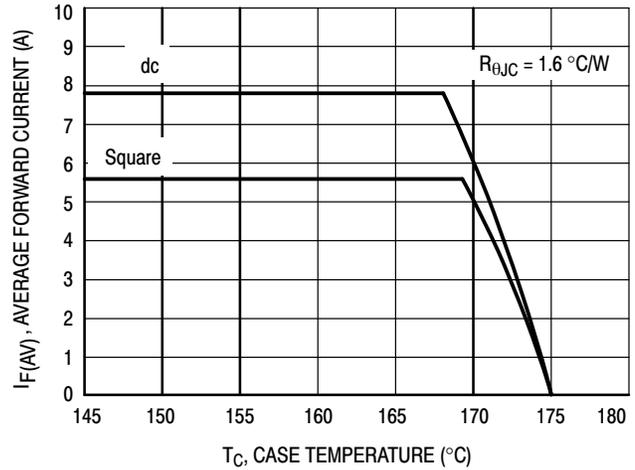


Figure 6. Current Derating, Case

# MBRD5H100T4G, NBRD5H100T4G

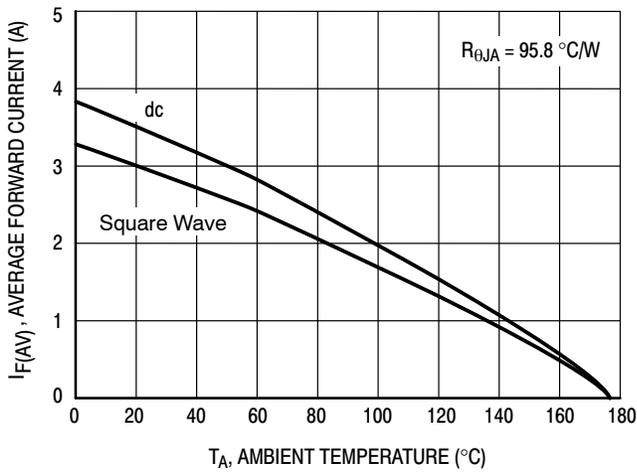


Figure 7. Current Derating, Ambient

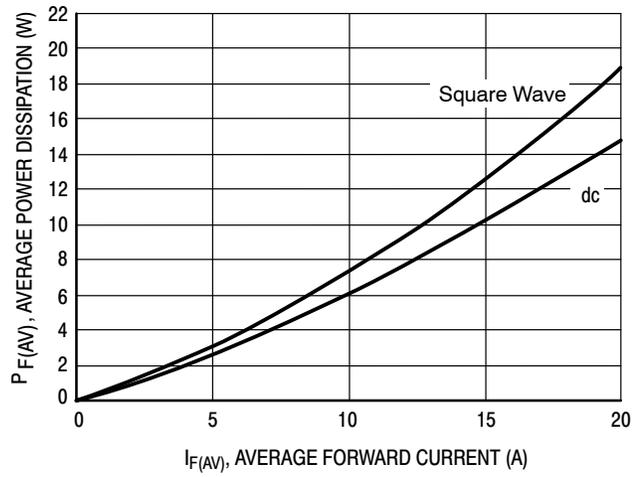


Figure 8. Forward Power Dissipation

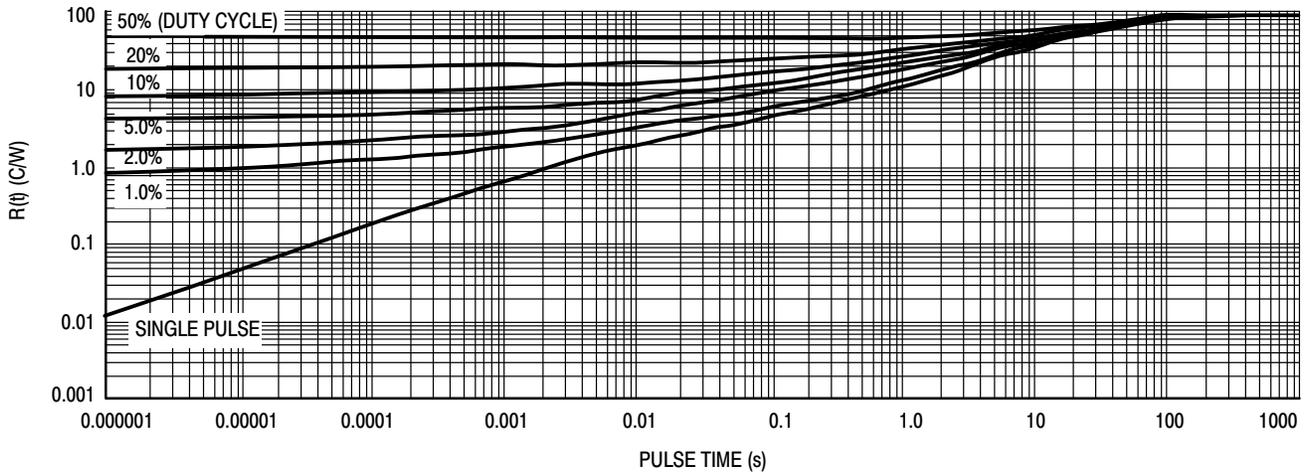
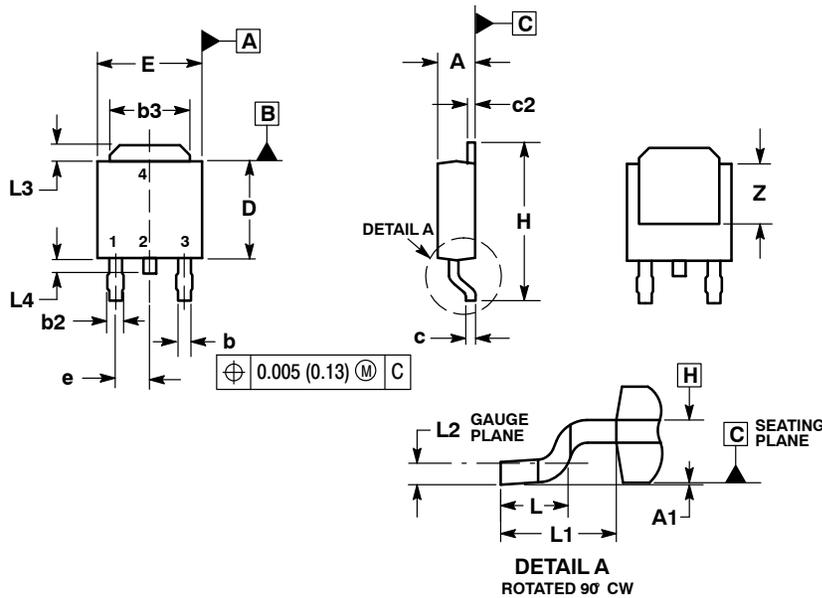


Figure 9. Thermal Response, Junction-to-Case

# MBRD5H100T4G, NBRD5H100T4G

## PACKAGE DIMENSIONS

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

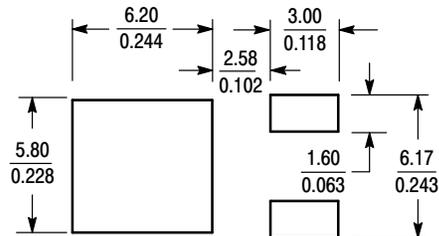


**NOTES:**

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  $\left(\frac{\text{mm}}{\text{inches}}\right)$

\*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 and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

### 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](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local Sales Representative