

# Switch-mode Schottky Power Rectifier

## Surface Mount Power Package

**MBRB1045G,  
MBRD1045G,  
SBRB1045G,  
SBRD81045T4G**

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.

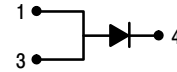
### Features

- 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!
- SBRB and SBRD8 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

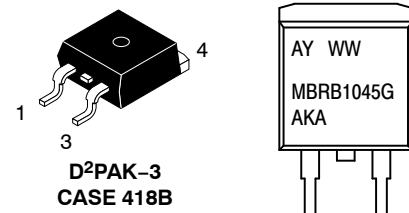
### Mechanical Characteristics:

- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 grams for D<sup>2</sup>PAK (approximately)  
0.4 grams for DPAK (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)

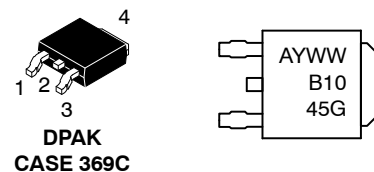
## SCHOTTKY BARRIER RECTIFIER 10 AMPERES, 45 VOLTS



### MARKING DIAGRAM



A = Assembly Location  
 Y = Year  
 WW = Work Week  
 MBRB1045 = Device Code  
 G = Pb-Free Package  
 AKA = Diode Polarity



A = Assembly Location  
 Y = Year  
 WW = Work Week  
 B1045 = Device Code  
 G = Pb-Free Package

### ORDERING INFORMATION

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

# **MBRB1045G, MBRD1045G, SBRB1045G, SBRD81045T4G**

## **MAXIMUM RATINGS**

| Rating   | Symbol                          | Value                                   | Unit               |
|--|---------------------------------|---|--------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 45                                      | V                  |
| Average Rectified Forward Current, $T_C = 135\text{ }^{\circ}\text{C}$                                     | $I_{F(AV)}$                     | 10                                      | A                  |
| Peak Repetitive Forward Current<br>(Square Wave, Duty = 0.5) $T_C = 135\text{ }^{\circ}\text{C}$           | $I_{FRM}$                       | 20                                      | A                  |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 150<br>(MBRB/SBRB)<br>70<br>(MBRD/SBRD) | A                  |
| Operating Junction and Storage Temperature Range (Note 1)  | $T_J, T_{stg}$                  | -65 to +175                             | $^{\circ}\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | $dv/dt$                         | 10000                                   | V/ $\mu\text{s}$   |

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.

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,<br>(MBRB1045G)<br>Junction-to-Case (Note 2)<br>Junction-to-Ambient (Note 2)<br>(MBRD1045G)<br>Junction-to-Case (Note 2)<br>Junction-to-Ambient (Note 2) | $R_{\theta JC}$<br>$R_{\theta JA}$<br>$R_{\theta JC}$<br>$R_{\theta JA}$ | 1.0<br>50<br>2.43<br>68 | $^{\circ}\text{C/W}$ |

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

## **ELECTRICAL CHARACTERISTICS**

| Characteristic  | Symbol | Value                | Unit |
|---|--------|----------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3)<br>( $I_F = 10\text{ Amps}$ , $T_J = 125\text{ }^{\circ}\text{C}$ )<br>( $I_F = 20\text{ Amps}$ , $T_J = 125\text{ }^{\circ}\text{C}$ )<br>( $I_F = 20\text{ Amps}$ , $T_J = 25\text{ }^{\circ}\text{C}$ ) | $V_F$  | 0.57<br>0.72<br>0.84 | V    |
| Maximum Instantaneous Reverse Current (Note 3)<br>(Rated dc Voltage, $T_J = 125\text{ }^{\circ}\text{C}$ )<br>(Rated dc Voltage, $T_J = 25\text{ }^{\circ}\text{C}$ )   | $I_R$  | 15<br>0.1            | 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.

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

## MBRB1045G, MBRD1045G, SBRB1045G, SBRD81045T4G

### ORDERING INFORMATION

| Device      | Package                           | Shipping <sup>†</sup>     |
|-------------|-----------------------------------|---------------------------|
| SBRB1045T4G | D <sup>2</sup> PAK-3<br>(Pb-Free) | 800 Units / Tape & Reel   |
| MBRD1045T4G | DPAK<br>(Pb-Free)                 | 2,500 Units / Tape & Reel |

### DISCONTINUED (Note 4)

| Device        | Package                           | Shipping <sup>†</sup>     |
|---------------|-----------------------------------|---------------------------|
| MBRB1045G     | D <sup>2</sup> PAK-3<br>(Pb-Free) | 50 Units / Rail           |
| SBRB1045G     |                                   | 50 Units / Rail           |
| MBRB1045T4G   |                                   | 800 Units / Tape & Reel   |
| MBRD1045G     | DPAK<br>(Pb-Free)                 | 50 Units / Rail           |
| SBRD81045T4G  | DPAK<br>(Pb-Free)                 | 2,500 Units / Tape & Reel |
| SSBRD81045T4G |                                   | 2,500 Units / 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.

4. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).

# MBRB1045G, MBRD1045G, SBRB1045G, SBRD81045T4G

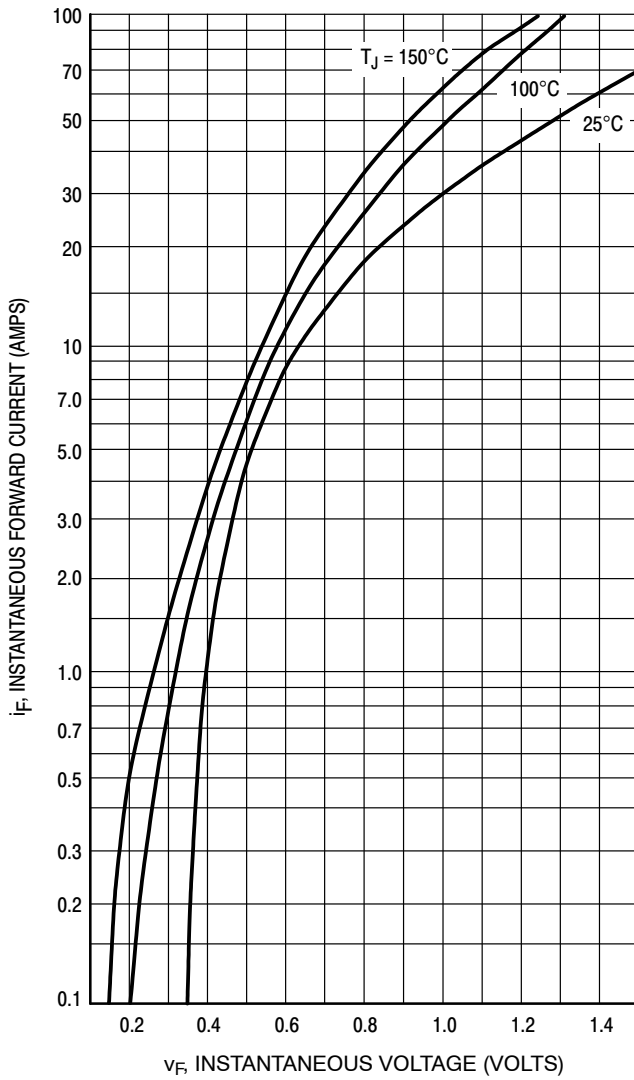


Figure 1. Maximum Forward Voltage

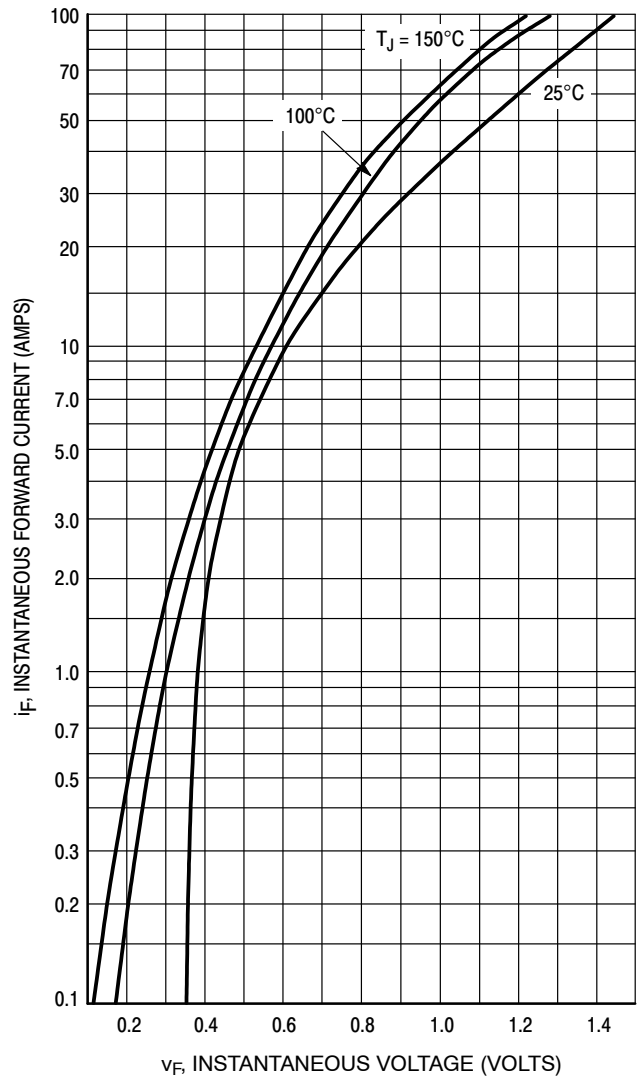


Figure 2. Typical Forward Voltage

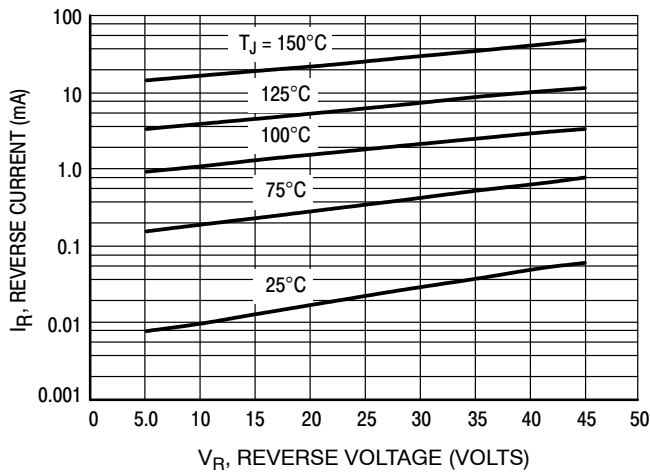


Figure 3. Maximum Reverse Current

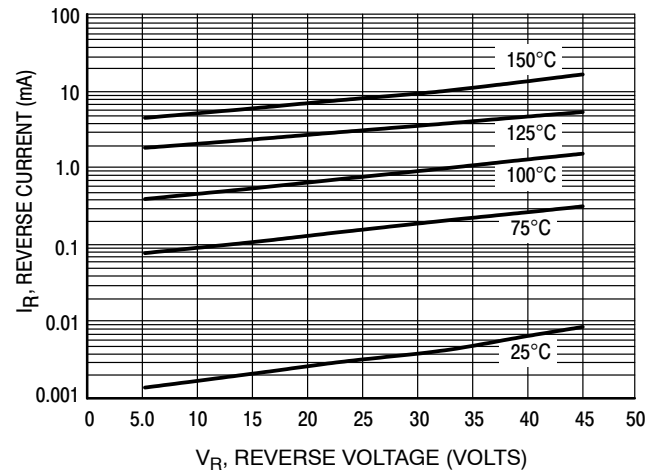


Figure 4. Typical Reverse Current

# MBRB1045G, MBRD1045G, SBRB1045G, SBRD81045T4G

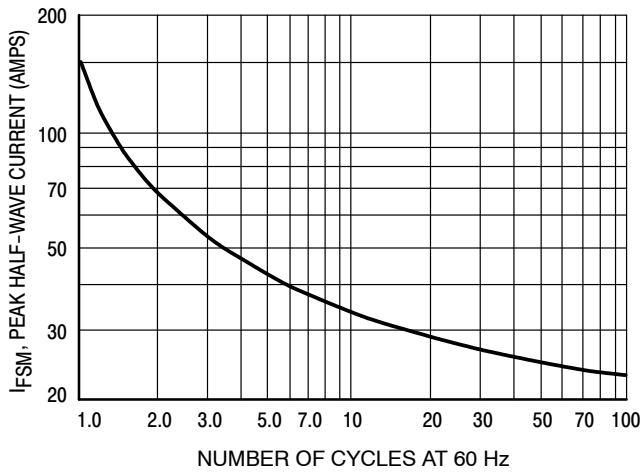


Figure 8. Maximum Surge Capability

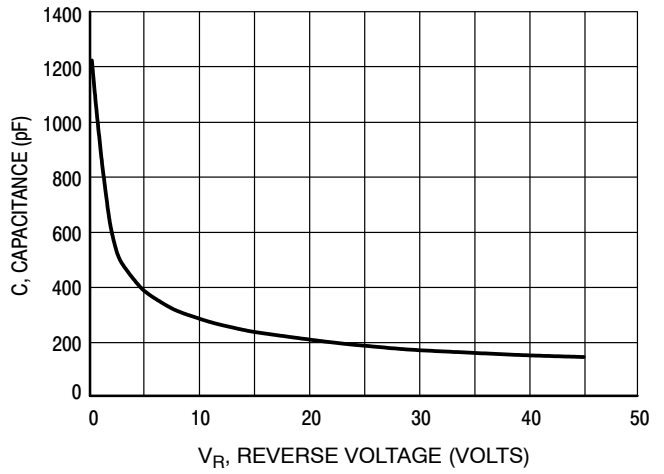


Figure 5. Typical Capacitance

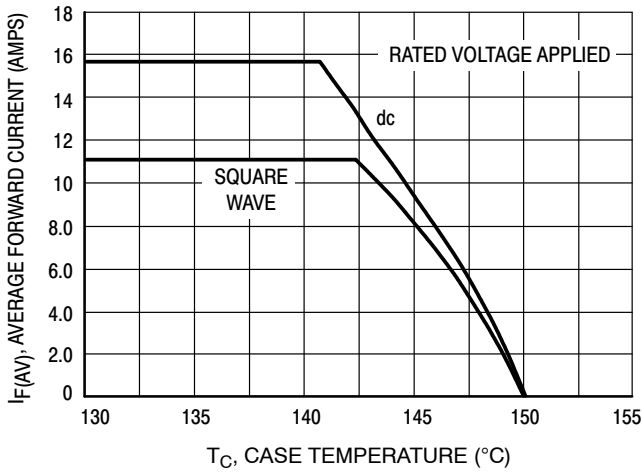


Figure 6. Current Derating, Case,  
 $R_{\theta JC} = 1.0\text{ }^{\circ}\text{C/W}$

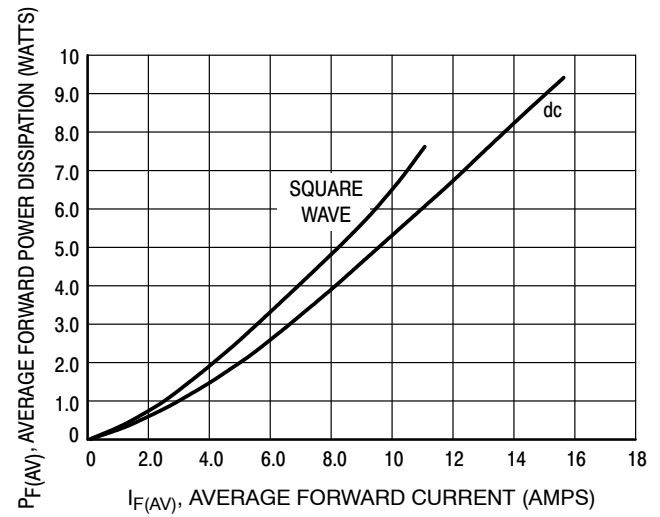


Figure 7. Forward Power Dissipation

## MBRB1045G, MBRD1045G, SBRB1045G, SBRD81045T4G

### REVISION HISTORY

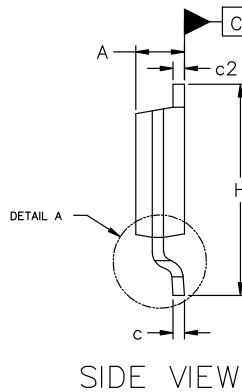
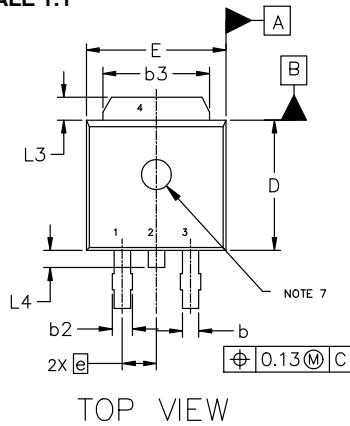
| Revision | Description of Changes  | Date     |
|----------|---|----------|
| 12       | MBRB1045G, SBRB1045G, MBRB1045T4G, MBRD1045G, SBRD81045T4G, SS-BRD81045T4G OPN Marked as Discontinued + Rebranded the Data Sheet to onsemi format | 7/1/2025 |



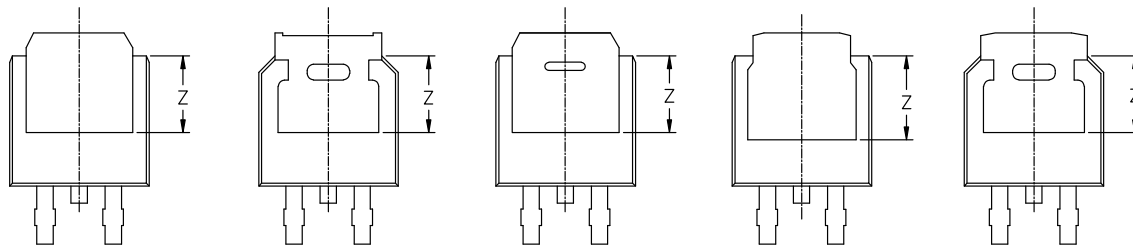
DPAK3 6.10x6.54x2.28, 2.29P  
CASE 369C  
ISSUE H

DATE 15 JUL 2025

SCALE 1:1

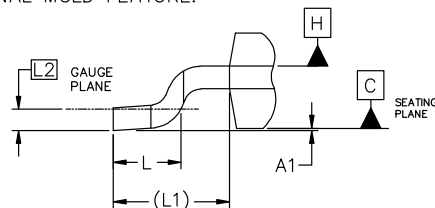


| MILLIMETERS |          |       |       |
|-------------|----------|-------|-------|
| DIM         | MIN      | NOM   | MAX   |
| A           | 2.18     | 2.28  | 2.38  |
| A1          | 0.00     | ---   | 0.13  |
| b           | 0.63     | 0.76  | 0.89  |
| b2          | 0.72     | 0.93  | 1.14  |
| b3          | 4.57     | 5.02  | 5.46  |
| c           | 0.46     | 0.54  | 0.61  |
| c2          | 0.46     | 0.54  | 0.61  |
| D           | 5.97     | 6.10  | 6.22  |
| E           | 6.35     | 6.54  | 6.73  |
| e           | 2.29 BSC |       |       |
| H           | 9.40     | 9.91  | 10.41 |
| L           | 1.40     | 10.10 | 1.78  |
| L1          | 2.90 REF |       |       |
| L2          | 0.51 BSC |       |       |
| L3          | 0.89     | ---   | 1.27  |
| L4          | ---      | ---   | 1.01  |
| Z           | 3.93     | ---   | ---   |



NOTES:

1. DIMENSIONING AND TOLERANCING ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
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 0.15mm 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.
7. OPTIONAL MOLD FEATURE.



RECOMMENDED MOUNTING FOOTPRINT\*

\*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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DPAK3 6.10x6.54x2.28, 2.29P  
CASE 369C  
ISSUE H

DATE 15 JUL 2025

GENERIC  
MARKING DIAGRAM\*



XXXXXX = Device Code  
A = Assembly Location  
L = Wafer Lot  
Y = Year  
WW = Work Week  
G = Pb-Free Package

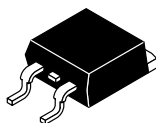
\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

|   |   |  |  |   |
|---|---|--|--|---|
| STYLE 1:<br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 2:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN          | STYLE 3:<br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | STYLE 4:<br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE<br>4. ANODE              | STYLE 5:<br>PIN 1. GATE<br>2. ANODE<br>3. CATHODE<br>4. ANODE     |
| STYLE 6:<br>PIN 1. MT1<br>2. MT2<br>3. GATE<br>4. MT2                 | STYLE 7:<br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 8:<br>PIN 1. N/C<br>2. CATHODE<br>3. ANODE<br>4. CATHODE   | STYLE 9:<br>PIN 1. ANODE<br>2. CATHODE<br>3. RESISTOR ADJUST<br>4. CATHODE | STYLE 10:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE |

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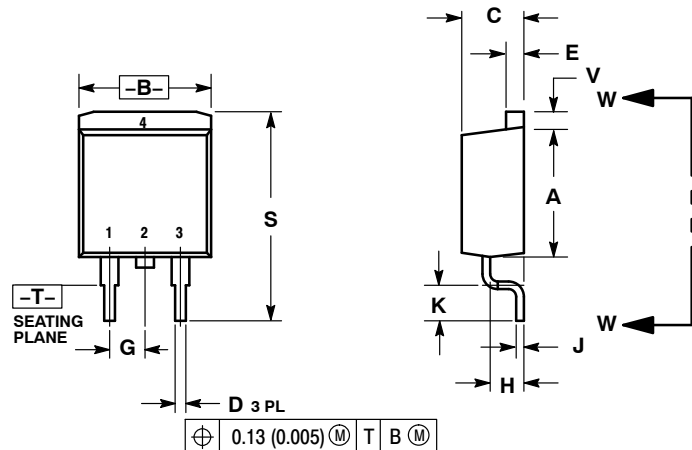




D<sup>2</sup>PAK 3  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

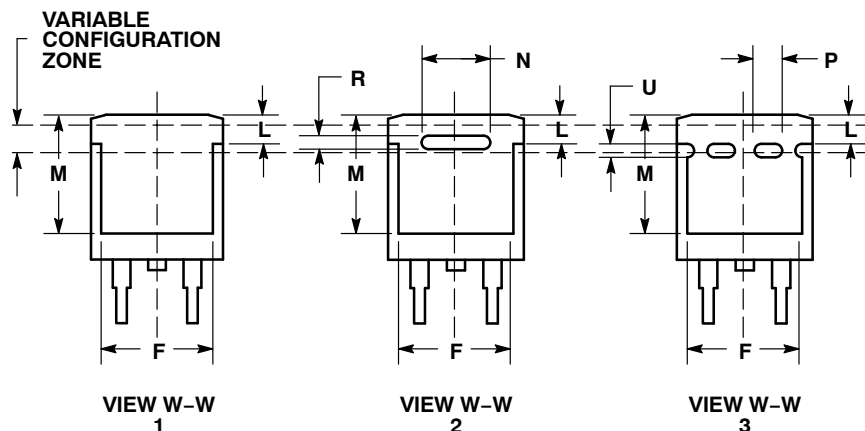
SCALE 1:1



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.340  | 0.380 | 8.64        | 9.65  |
| B   | 0.380  | 0.405 | 9.65        | 10.29 |
| C   | 0.160  | 0.190 | 4.06        | 4.83  |
| D   | 0.020  | 0.035 | 0.51        | 0.89  |
| E   | 0.045  | 0.055 | 1.14        | 1.40  |
| F   | 0.310  | 0.350 | 7.87        | 8.89  |
| G   | 0.100  | BSC   | 2.54        | BSC   |
| H   | 0.080  | 0.110 | 2.03        | 2.79  |
| J   | 0.018  | 0.025 | 0.46        | 0.64  |
| K   | 0.090  | 0.110 | 2.29        | 2.79  |
| L   | 0.052  | 0.072 | 1.32        | 1.83  |
| M   | 0.280  | 0.320 | 7.11        | 8.13  |
| N   | 0.197  | REF   | 5.00        | REF   |
| P   | 0.079  | REF   | 2.00        | REF   |
| R   | 0.039  | REF   | 0.99        | REF   |
| S   | 0.575  | 0.625 | 14.60       | 15.88 |
| V   | 0.045  | 0.055 | 1.14        | 1.40  |



|   |  |  |   |  |   |
|---|--|--|---|--|---|
| STYLE 1:<br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 2:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN | STYLE 3:<br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | STYLE 4:<br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 5:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE | STYLE 6:<br>PIN 1. NO CONNECT<br>2. CATHODE<br>3. ANODE<br>4. CATHODE |
|---|--|--|---|--|---|

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

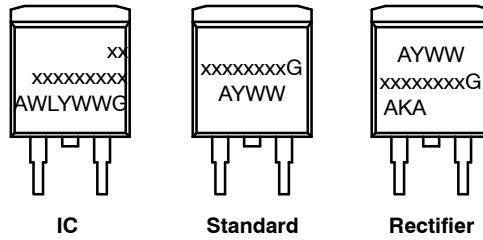
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| DESCRIPTION:     | D <sup>2</sup> PAK 3 | PAGE 1 OF 2   |

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**D<sup>2</sup>PAK 3**  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

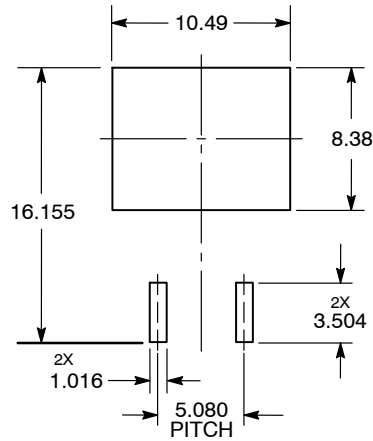
**GENERIC  
MARKING DIAGRAM\***



xx = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
AKA = Polarity Indicator

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

**SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

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

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