

# Complementary Silicon Plastic Power Transistors

D<sup>2</sup>PAK for Surface Mount

**MJB41C,**  
**NJVMJB41CT4G (NPN),**  
**MJB42C,**  
**NJVMJB42CT4G (PNP)**

## Features

- Lead Formed for Surface Mount Applications in Plastic Sleeves (No Suffix)
- Electrically the Same as TIP41 and T1P42 Series
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- Pb-Free Packages are Available

## MAXIMUM RATINGS

| Rating                                                                                   | Symbol         | Value        | Unit                     |
|------------------------------------------------------------------------------------------|----------------|--------------|--------------------------|
| Collector-Emitter Voltage                                                                | $V_{CEO}$      | 100          | Vdc                      |
| Collector-Base Voltage                                                                   | $V_{CB}$       | 100          | Vdc                      |
| Emitter-Base Voltage                                                                     | $V_{EB}$       | 5.0          | Vdc                      |
| Collector Current – Continuous<br>– Peak                                                 | $I_C$          | 6.0<br>10    | Adc                      |
| Base Current                                                                             | $I_B$          | 2.0          | Adc                      |
| Total Power Dissipation<br>@ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 65<br>0.52   | W<br>W/ $^\circ\text{C}$ |
| Total Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 2.0<br>0.016 | W<br>W/ $^\circ\text{C}$ |
| Unclamped Inductive Load Energy (Note 1)                                                 | E              | 62.5         | mJ                       |
| Operating and Storage Junction Temperature Range                                         | $T_J, T_{stg}$ | -65 to +150  | $^\circ\text{C}$         |

## THERMAL CHARACTERISTICS

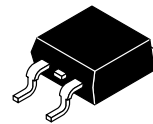
| Characteristic                                                                 | Symbol          | Max  | Unit               |
|--------------------------------------------------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction-to-Case                                           | $R_{\theta JC}$ | 1.92 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient                                        | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)                               | $R_{\theta JA}$ | 50   | $^\circ\text{C/W}$ |
| Maximum Lead Temperature for Soldering Purposes, 1/8" from Case for 10 Seconds | $T_L$           | 260  | $^\circ\text{C}$   |

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.

- $I_C = 2.5\text{ A}$ ,  $L = 20\text{ mH}$ , P.R.F. = 10 Hz,  $V_{CC} = 10\text{ V}$ ,  $R_{BE} = 100\ \Omega$
- When surface mounted to an FR-4 board using the minimum recommended pad size.

**COMPLEMENTARY SILICON  
POWER TRANSISTORS  
6 AMPERES,  
100 VOLTS, 65 WATTS**

## MARKING DIAGRAM



D<sup>2</sup>PAK  
CASE 418B  
STYLE 1



J4xC = Specific Device Code  
x = 1 or 2  
A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

## ORDERING INFORMATION

| Device       | Package                      | Shipping <sup>†</sup> |
|--------------|------------------------------|-----------------------|
| MJB41CG      | D <sup>2</sup> PAK (Pb-Free) | 50 Units / Rail       |
| MJB41CT4G    | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & Reel     |
| NJVMJB41CT4G | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & Reel     |
| MJB42CT4G    | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & Reel     |
| NJVMJB42CT4G | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & Reel     |

## DISCONTINUED (Note 1)

|         |                              |                 |
|---------|------------------------------|-----------------|
| MJB42CG | D <sup>2</sup> PAK (Pb-Free) | 50 Units / Rail |
|---------|------------------------------|-----------------|

<sup>†</sup> For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](http://BRD8011/D).

- DISCONTINUED:** This device is not available. 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).

# MJB41C, NJVMJB41CT4G (NPN), MJB42C, NJVMJB42CT4G (PNP)

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

### OFF CHARACTERISTICS

|                                                                                      |                |     |     |                 |
|--------------------------------------------------------------------------------------|----------------|-----|-----|-----------------|
| Collector-Emitter Sustaining Voltage (Note 3) ( $I_C = 30\text{ mAdc}$ , $I_B = 0$ ) | $V_{CEO(sus)}$ | 100 | –   | Vdc             |
| Collector Cutoff Current ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )                    | $I_{CEO}$      | –   | 0.7 | mAdc            |
| Collector Cutoff Current ( $V_{CE} = 100\text{ Vdc}$ , $V_{EB} = 0$ )                | $I_{CES}$      | –   | 100 | $\mu\text{Adc}$ |
| Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )                     | $I_{EBO}$      | –   | 50  | $\mu\text{Adc}$ |

### ON CHARACTERISTICS (Note 3)

|                                                                                                                                     |               |          |         |     |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------|-----|
| DC Current Gain<br>( $I_C = 0.3\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )<br>( $I_C = 3.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) | $h_{FE}$      | 30<br>15 | –<br>75 | –   |
| Collector-Emitter Saturation Voltage ( $I_C = 6.0\text{ Adc}$ , $I_B = 600\text{ mAdc}$ )                                           | $V_{CE(sat)}$ | –        | 1.5     | Vdc |
| Base-Emitter On Voltage ( $I_C = 6.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )                                                      | $V_{BE(on)}$  | –        | 2.0     | Vdc |

### DYNAMIC CHARACTERISTICS

|                                                                                                                       |          |     |   |     |
|-----------------------------------------------------------------------------------------------------------------------|----------|-----|---|-----|
| Current-Gain – Bandwidth Product ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ ) | $f_T$    | 3.0 | – | MHz |
| Small-Signal Current Gain ( $I_C = 0.5\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )                | $h_{fe}$ | 20  | – | –   |

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  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MJB41C, NJVMJB41CT4G (NPN), MJB42C, NJVMJB42CT4G (PNP)

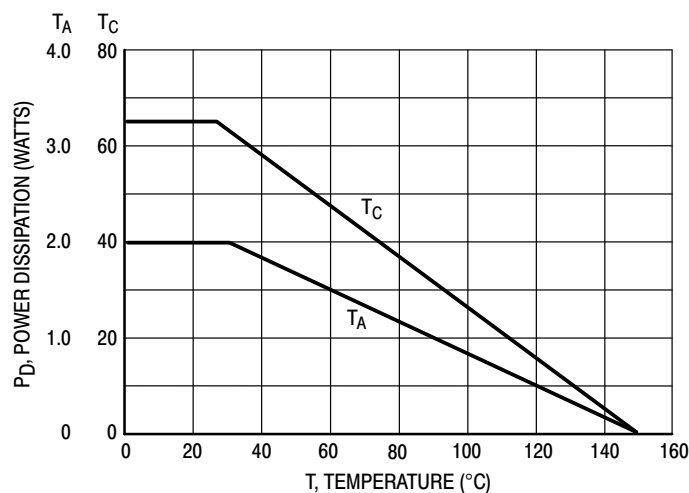


Figure 1. Power Derating

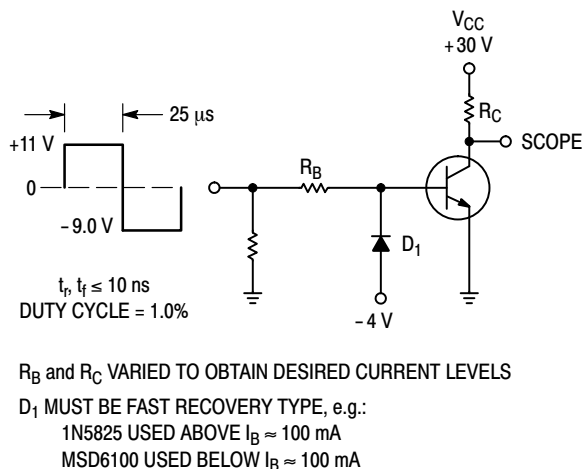


Figure 2. Switching Time Test Circuit

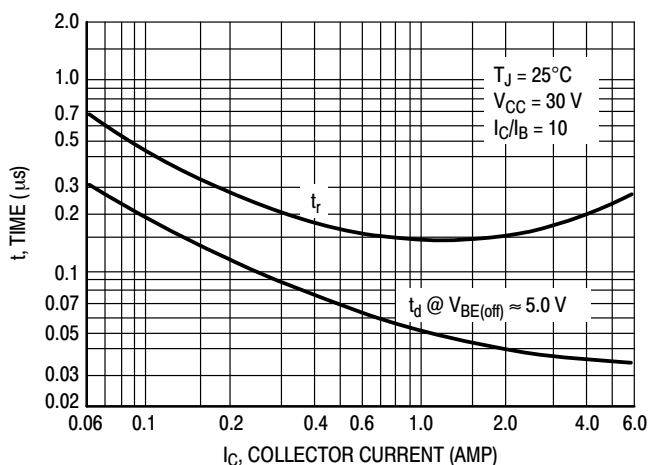


Figure 3. Turn-On Time

# MJB41C, NJVMJB41CT4G (NPN), MJB42C, NJVMJB42CT4G (PNP)

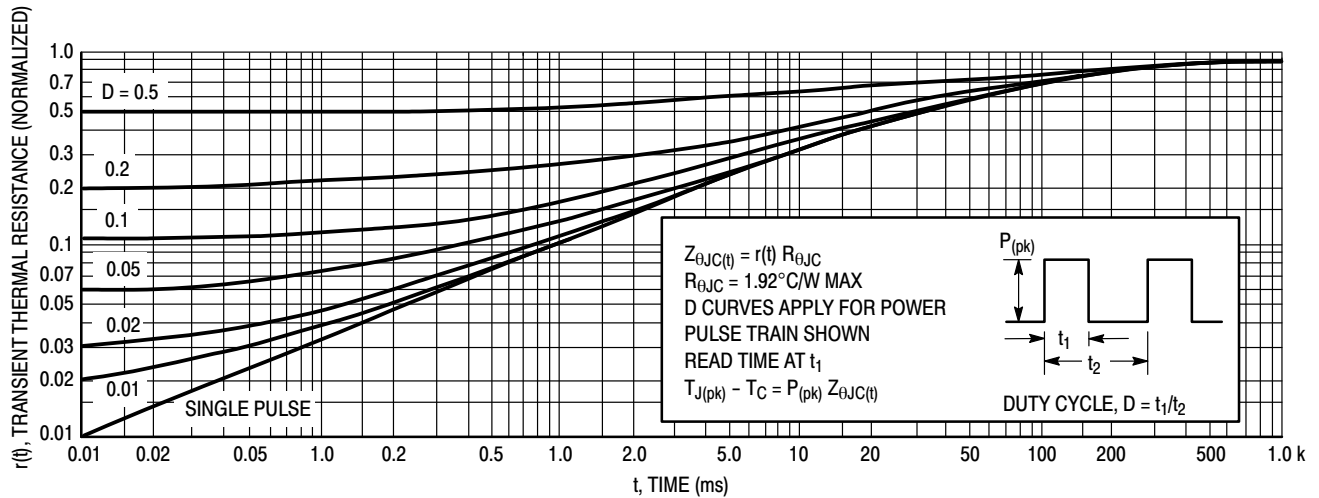


Figure 4. Thermal Response

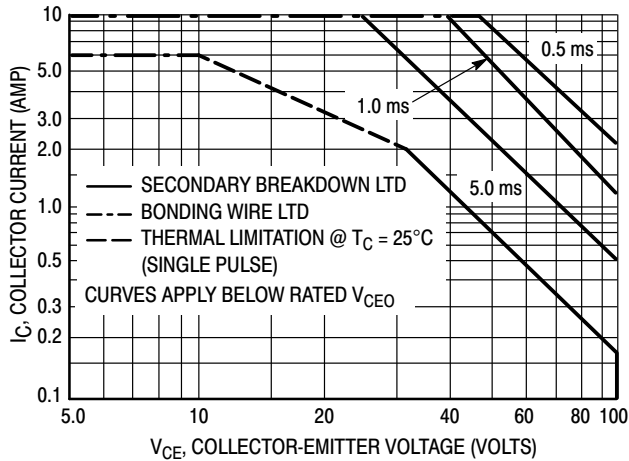


Figure 5. Active-Region Safe Operating Area

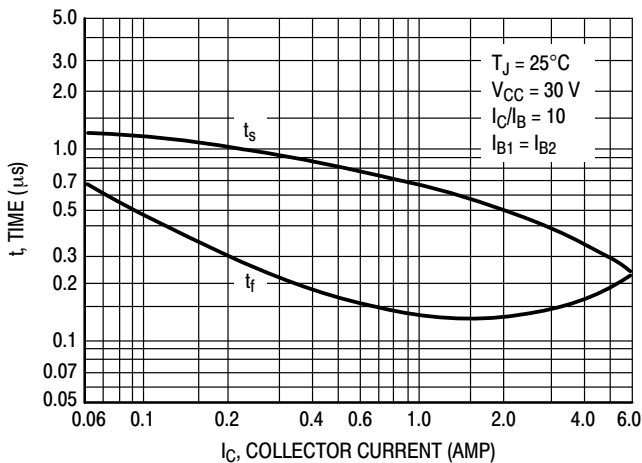


Figure 6. Turn-Off Time

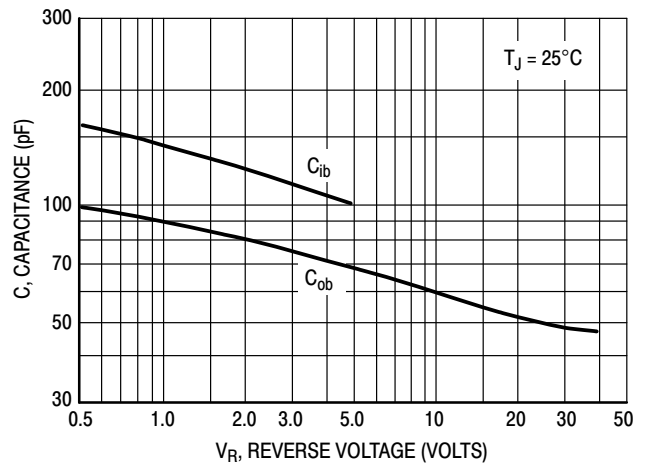


Figure 7. Capacitance

# MJB41C, NJVMJB41CT4G (NPN), MJB42C, NJVMJB42CT4G (PNP)

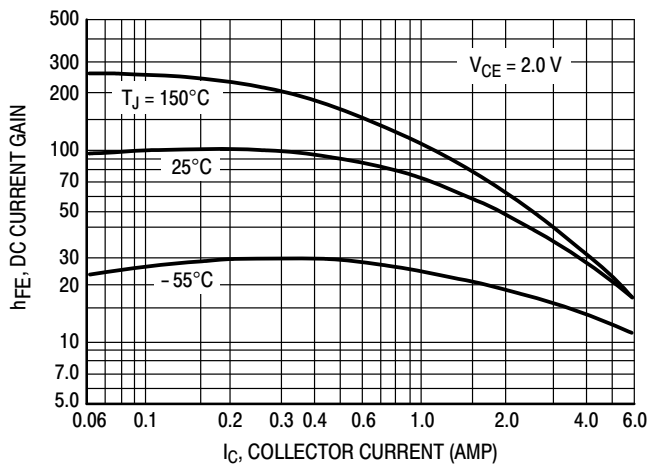


Figure 8. DC Current Gain

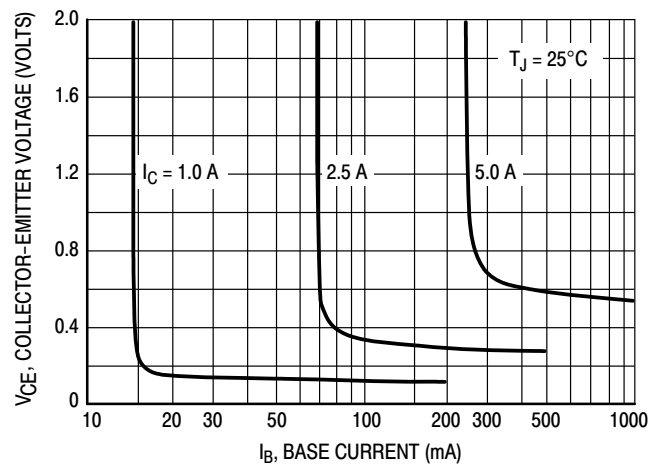


Figure 9. Collector Saturation Region

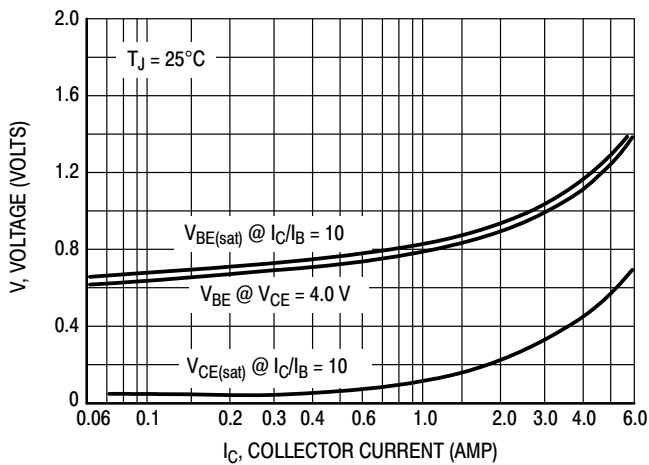


Figure 10. "On" Voltages

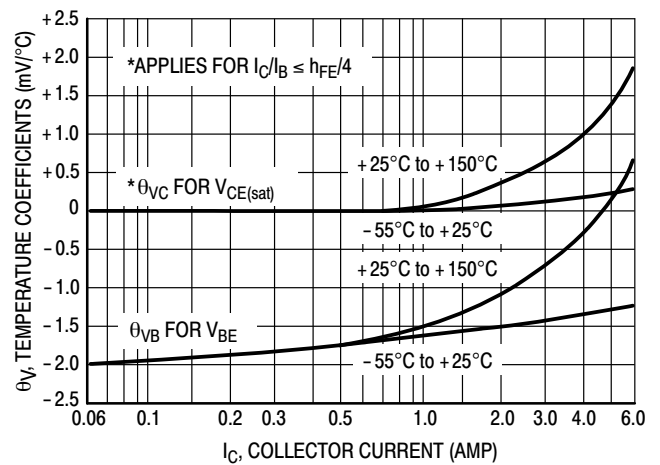


Figure 11. Temperature Coefficients

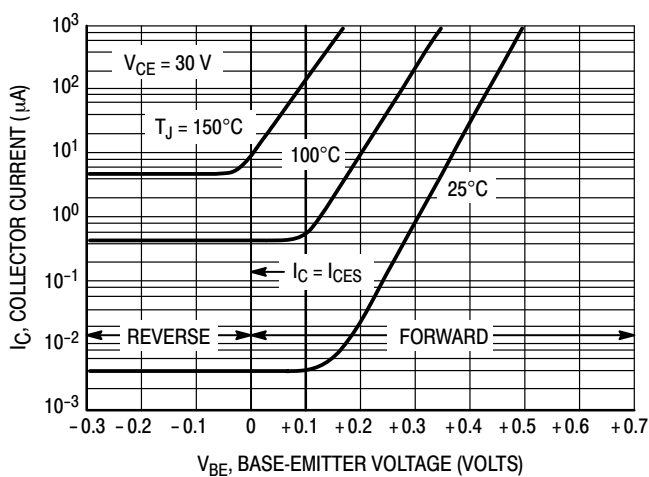


Figure 12. Collector Cut-Off Region

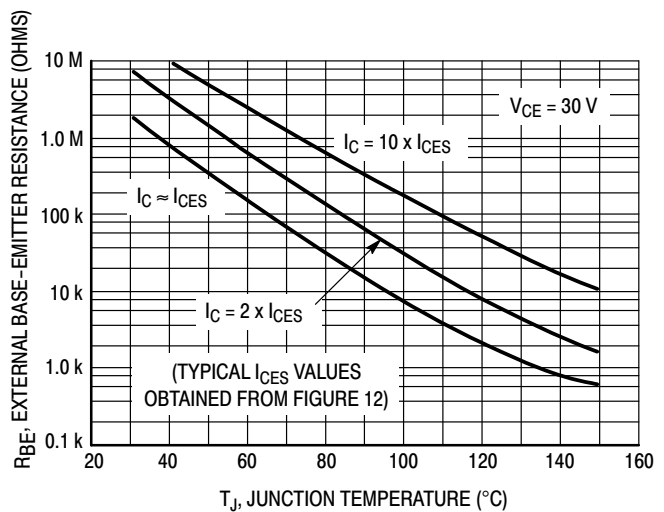


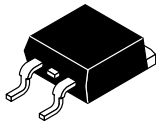
Figure 13. Effects of Base-Emitter Resistance

## MJB41C, NJVMJB41CT4G (NPN), MJB42C, NJVMJB42CT4G (PNP)

### REVISION HISTORY

| Revision | Description of Changes                                                                   | Date       |
|----------|------------------------------------------------------------------------------------------|------------|
| 5        | Rebranded the Data Sheet to <b>onsemi</b> format.<br>MJB42CG OPN Marked as Discontinued. | 10/27/2025 |

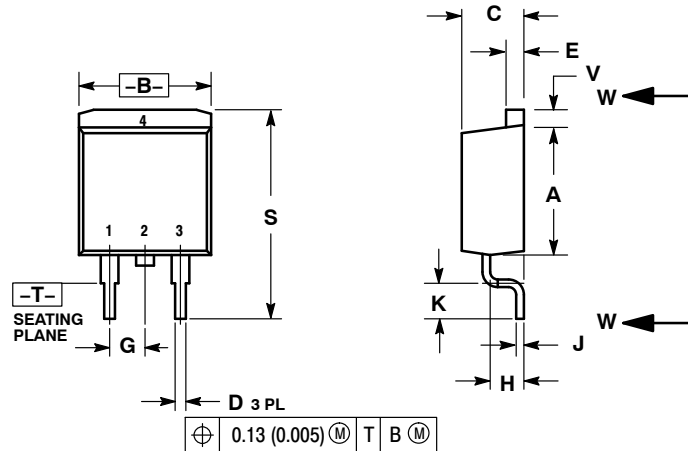
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



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

DATE 17 FEB 2015

SCALE 1:1

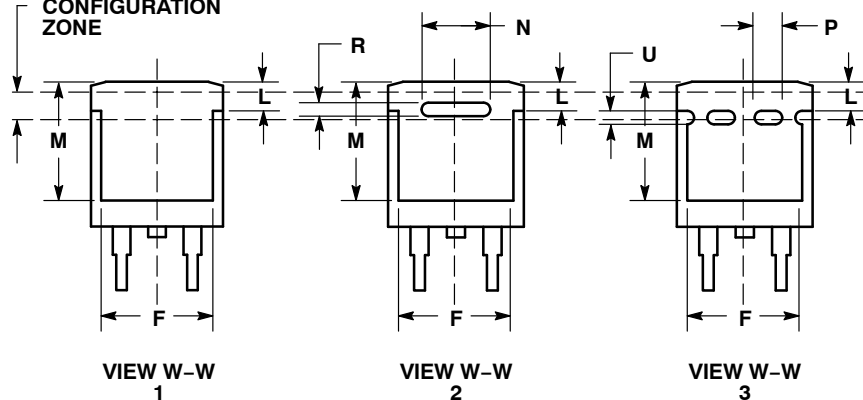


NOTES:

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  |

VARIABLE  
CONFIGURATION  
ZONE



STYLE 1:

- PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:

- PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 3:

- PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

STYLE 4:

- PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 5:

- PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. ANODE

STYLE 6:

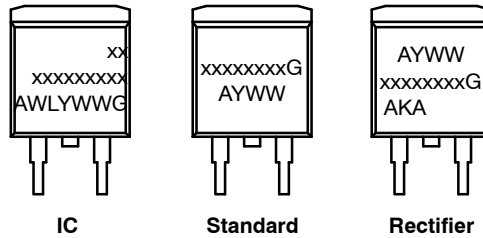
- PIN 1. NO CONNECT  
2. CATHODE  
3. ANODE  
4. CATHODE

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

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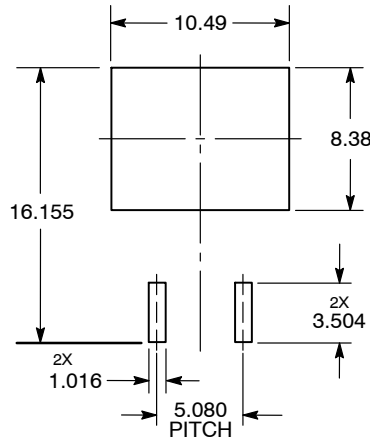
**GENERIC  
MARKING DIAGRAM\***



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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