

## 2SA2029M3T5G

### PNP Silicon General Purpose Amplifier Transistor

This PNP transistor is designed for general purpose amplifier applications. This device is housed in the SOT-723 package which is designed for low power surface mount applications, where board space is at a premium.

- Reduces Board Space
- High  $h_{FE}$ , 210–460 (Typical)
- Low  $V_{CE(sat)}$ , < 0.5 V
- ESD Performance: Human Body Model; > 2000 V, Machine Model; > 200 V
- Available in 4 mm, 8000 Unit Tape & Reel
- This is a Pb-Free Device

#### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

| Rating                         | Symbol        | Value | Unit |
|--------------------------------|---------------|-------|------|
| Collector–Base Voltage         | $V_{(BR)CBO}$ | –60   | Vdc  |
| Collector–Emitter Voltage      | $V_{(BR)CEO}$ | –50   | Vdc  |
| Emitter–Base Voltage           | $V_{(BR)EBO}$ | –6.0  | Vdc  |
| Collector Current – Continuous | $I_C$         | –100  | mAdc |

#### THERMAL CHARACTERISTICS

| Rating                     | Symbol    | Max        | Unit             |
|----------------------------|-----------|------------|------------------|
| Power Dissipation (Note 1) | $P_D$     | 265        | mW               |
| Junction Temperature       | $T_J$     | 150        | $^\circ\text{C}$ |
| Storage Temperature Range  | $T_{stg}$ | –55 ~ +150 | $^\circ\text{C}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

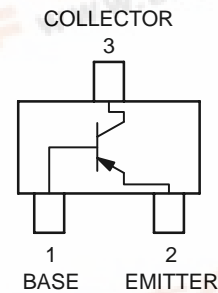
1. Device mounted on a FR-4 glass epoxy printed circuit board using the minimum recommended footprint.



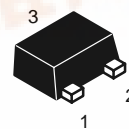
**ON Semiconductor®**

<http://onsemi.com>

### PNP GENERAL PURPOSE AMPLIFIER TRANSISTORS SURFACE MOUNT



#### MARKING DIAGRAM



**SOT-723  
CASE 631AA**



F9 = Specific Device Code  
M = Date Code

#### ORDERING INFORMATION

| Device       | Package           | Shipping†        |
|--------------|-------------------|------------------|
| 2SA2029M3T5G | SOT-723 (Pb-Free) | 8000/Tape & Reel |

†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.

## 2SA2029M3T5G

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Characteristic  | Symbol        | Min  | Typ | Max  | Unit          |
|---|---------------|------|-----|------|---------------|
| Collector–Base Breakdown Voltage ( $I_C = -50\ \mu\text{Adc}$ , $I_E = 0$ )                               | $V_{(BR)CBO}$ | -60  | –   | –    | Vdc           |
| Collector–Emitter Breakdown Voltage ( $I_C = -1.0\ \text{mAdc}$ , $I_B = 0$ )                             | $V_{(BR)CEO}$ | -50  | –   | –    | Vdc           |
| Emitter–Base Breakdown Voltage ( $I_E = -50\ \mu\text{Adc}$ , $I_C = 0$ )                                 | $V_{(BR)EBO}$ | -6.0 | –   | –    | Vdc           |
| Collector–Base Cutoff Current ( $V_{CB} = -30\ \text{Vdc}$ , $I_E = 0$ )                                  | $I_{CBO}$     | –    | –   | -0.5 | nA            |
| Emitter–Base Cutoff Current ( $V_{EB} = -7.0\ \text{Vdc}$ , $I_B = 0$ )                                   | $I_{EBO}$     | –    | –   | -0.1 | $\mu\text{A}$ |
| Collector–Emitter Saturation Voltage (Note 2)<br>( $I_C = -50\ \text{mAdc}$ , $I_B = -5.0\ \text{mAdc}$ ) | $V_{CE(sat)}$ | –    | –   | -0.5 | Vdc           |
| DC Current Gain (Note 2)<br>( $V_{CE} = -6.0\ \text{Vdc}$ , $I_C = -1.0\ \text{mAdc}$ )                   | $h_{FE}$      | 120  | –   | 560  | –             |
| Transition Frequency<br>( $V_{CE} = -12\ \text{Vdc}$ , $I_C = -2.0\ \text{mAdc}$ , $f = 30\ \text{MHz}$ ) | $f_T$         | –    | 140 | –    | MHz           |
| Output Capacitance ( $V_{CB} = -12\ \text{Vdc}$ , $I_E = 0\ \text{Adc}$ , $f = 1.0\ \text{MHz}$ )         | $C_{OB}$      | –    | 3.5 | –    | pF            |

2. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

## 2SA2029M3T5G

### TYPICAL ELECTRICAL CHARACTERISTICS

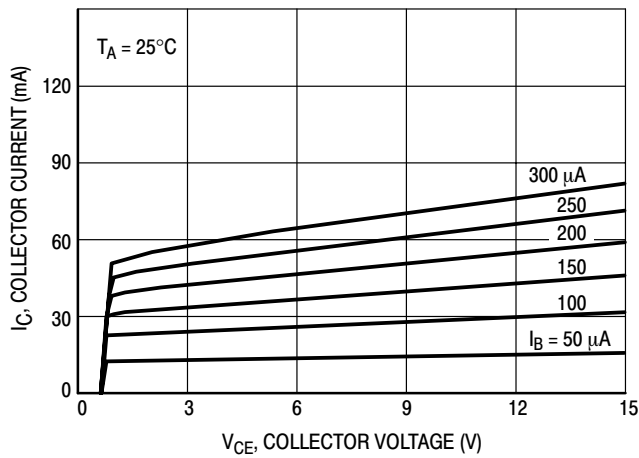


Figure 1.  $I_C - V_{CE}$

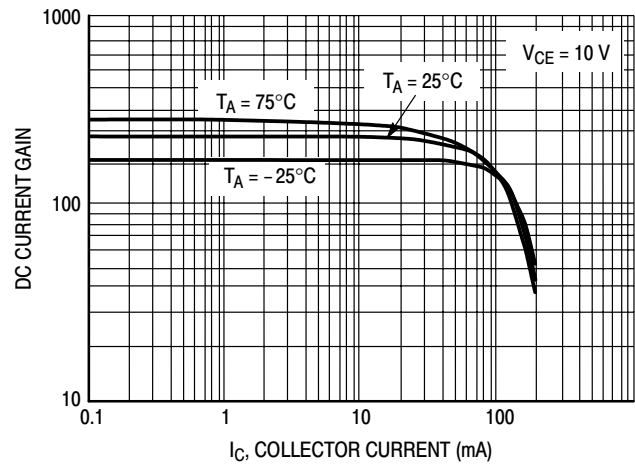


Figure 2. DC Current Gain

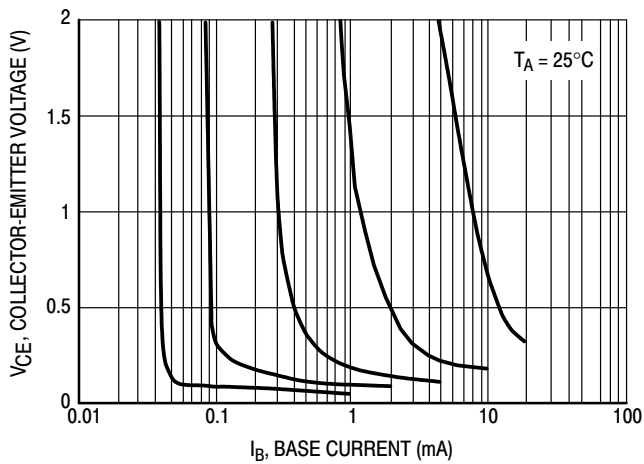


Figure 3. Collector Saturation Region

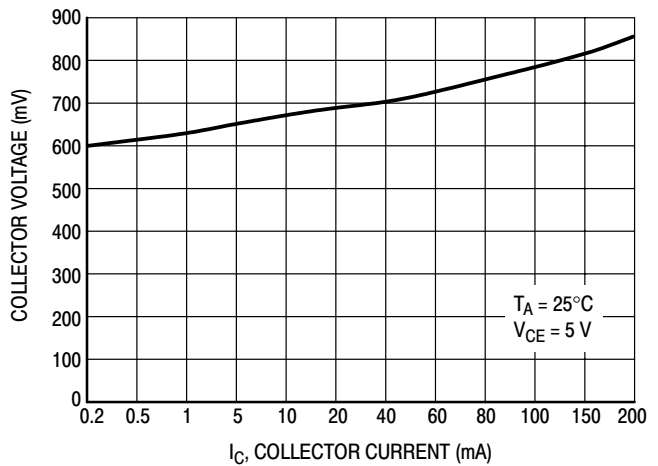


Figure 4. On Voltage

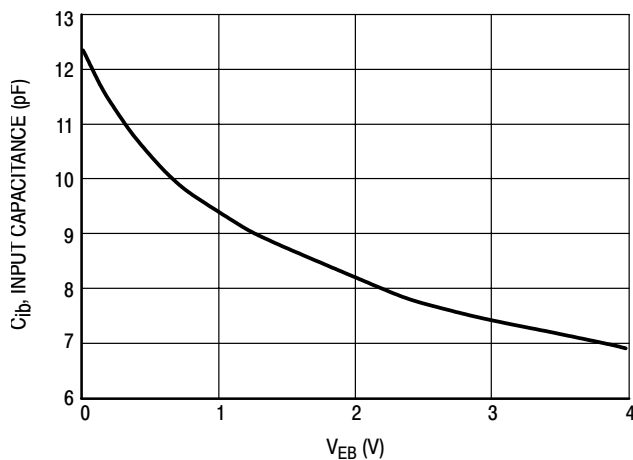


Figure 5. Capacitance

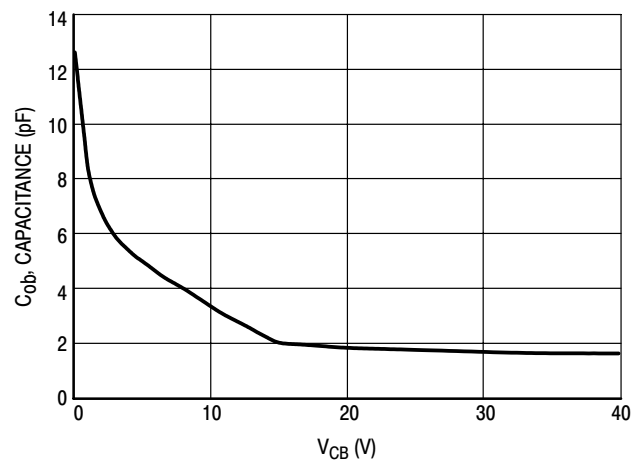
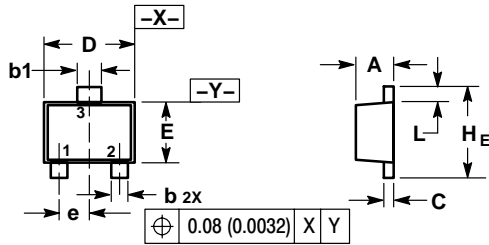


Figure 6. Capacitance

# 2SA2029M3T5G

## PACKAGE DIMENSIONS

**SOT-723**  
CASE 631AA-01  
ISSUE B

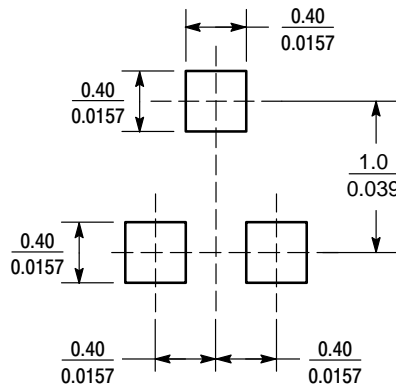


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

| DIM | MILLIMETERS |      |      | INCHES    |        |        |
|-----|-------------|------|------|-----------|--------|--------|
|     | MIN         | NOM  | MAX  | MIN       | NOM    | MAX    |
| A   | 0.45        | 0.50 | 0.55 | 0.018     | 0.020  | 0.022  |
| b   | 0.15        | 0.21 | 0.27 | 0.0059    | 0.0083 | 0.0106 |
| b1  | 0.25        | 0.31 | 0.37 | 0.010     | 0.012  | 0.015  |
| C   | 0.07        | 0.12 | 0.17 | 0.0028    | 0.0047 | 0.0067 |
| D   | 1.15        | 1.20 | 1.25 | 0.045     | 0.047  | 0.049  |
| E   | 0.75        | 0.80 | 0.85 | 0.03      | 0.032  | 0.034  |
| e   | 0.40 BSC    |      |      | 0.016 BSC |        |        |
| H E | 1.15        | 1.20 | 1.25 | 0.045     | 0.047  | 0.049  |
| L   | 0.15        | 0.20 | 0.25 | 0.0059    | 0.0079 | 0.0098 |


## SOLDERING FOOTPRINT\*



SCALE 20:1 (mm inches)

### SOT-723

\*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 61312, Phoenix, Arizona 85082-1312 USA  
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada  
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada  
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free  
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.