

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.

Features

- 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 | $^\circ\text{C}$ |

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.

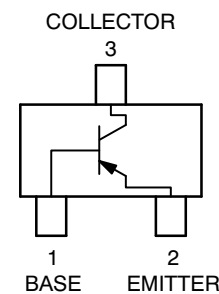
1. Device mounted on a FR-4 glass epoxy printed circuit board using the minimum recommended footprint.



ON Semiconductor®

<http://onsemi.com>

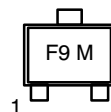
PNP GENERAL PURPOSE AMPLIFIER TRANSISTORS SURFACE MOUNT



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 | μA |
| Collector-Emitter Saturation Voltage (Note 2) ($I_C = -50 \text{ mAdc}$, $I_B = -5.0 \text{ mAdc}$) | $V_{CE(sat)}$ | - | - | -0.5 | Vdc |
| DC Current Gain (Note 2) ($V_{CE} = -6.0 \text{ Vdc}$, $I_C = -1.0 \text{ mAdc}$) | h_{FE} | 120 | - | 560 | - |
| Transition Frequency ($V_{CE} = -12 \text{ Vdc}$, $I_C = -2.0 \text{ mAdc}$, $f = 30 \text{ MHz}$) | 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 $\leq 2\%$.

TYPICAL ELECTRICAL CHARACTERISTICS

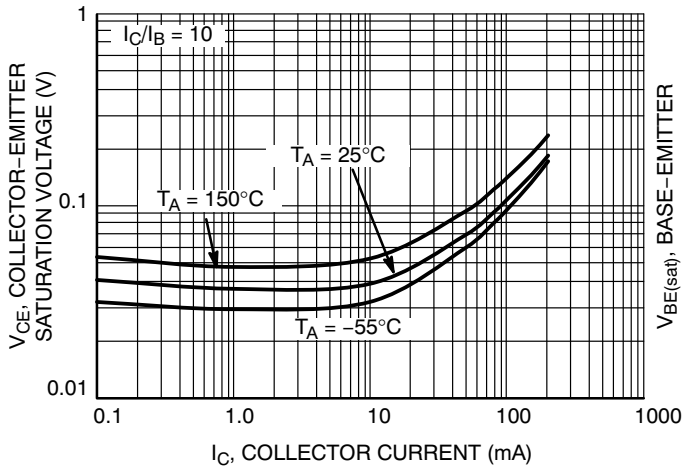


Figure 1. Collector-Emitter Saturation Voltage vs. Collector Current

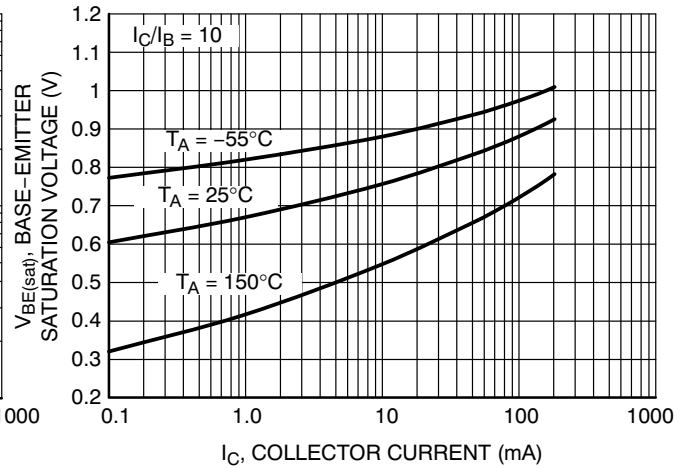


Figure 2. Base-Emitter Saturation Voltage vs. Collector Current

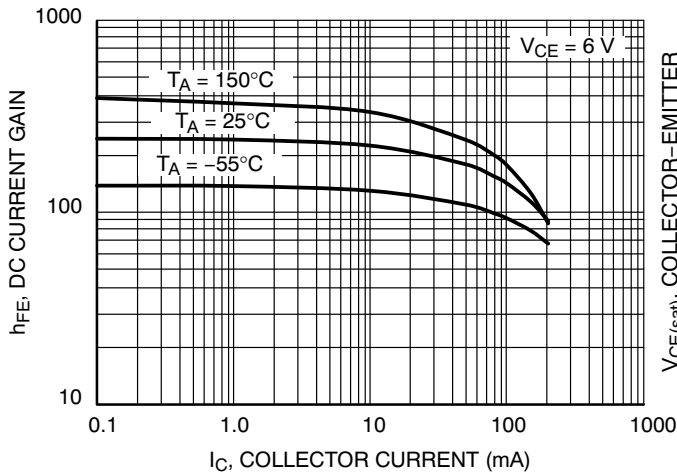


Figure 3. DC Current Gain vs. Collector Current

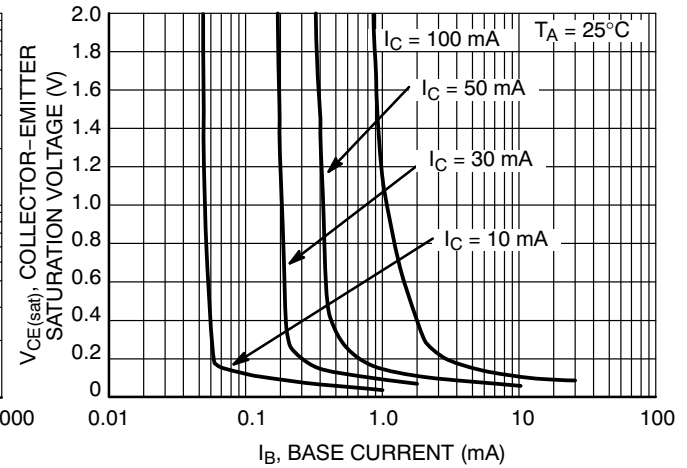


Figure 4. Saturation Region

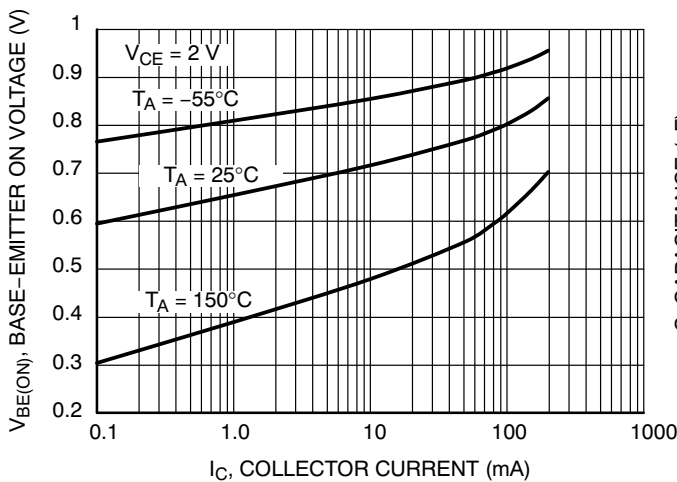


Figure 5. Base-Emitter Turn-ON Voltage vs. Collector Current

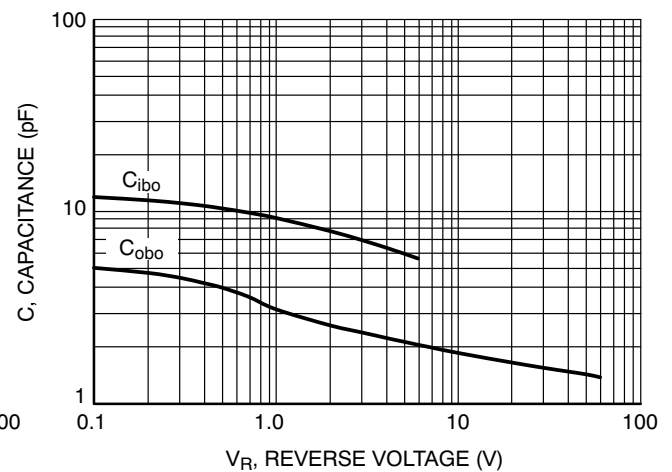


Figure 6. Capacitance

2SA2029M3T5G

TYPICAL ELECTRICAL CHARACTERISTICS

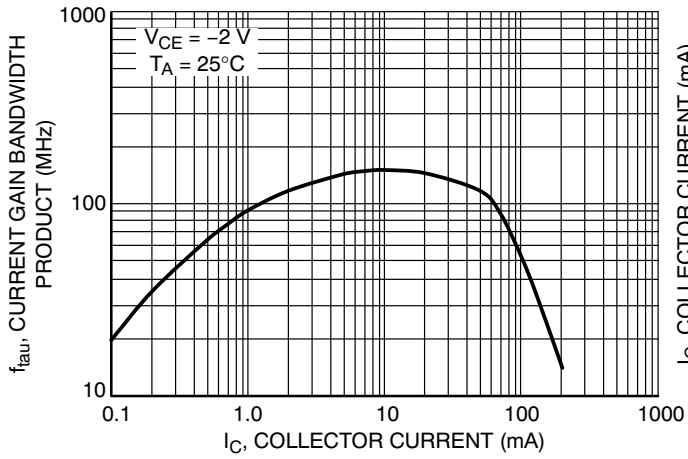


Figure 7. Current Gain Bandwidth Product vs. Collector Current

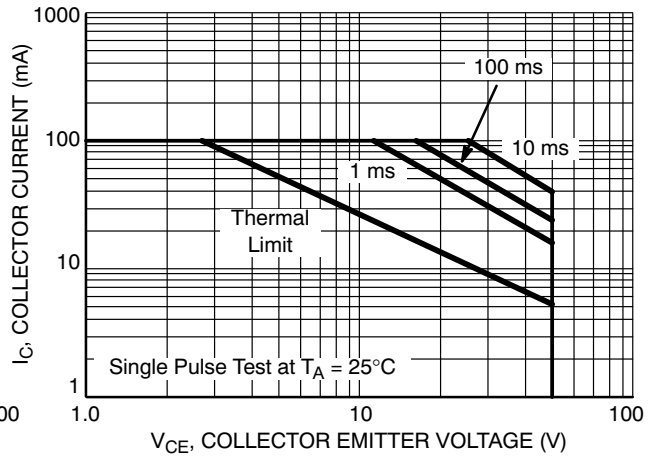
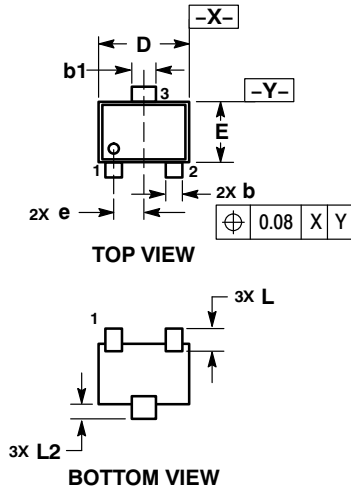


Figure 8. Safe Operating Area

2SA2029M3T5G

PACKAGE DIMENSIONS

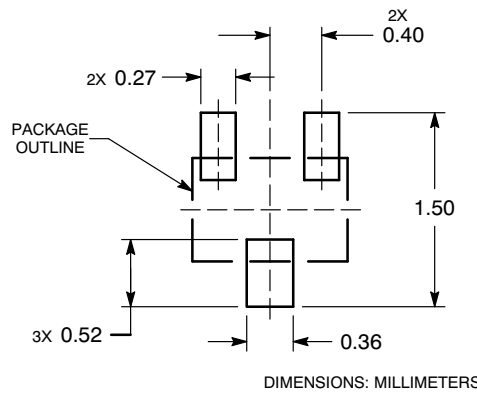
SOT-723
CASE 631AA
ISSUE D



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

| MILLIMETERS | | | |
|-------------|----------|------|------|
| DIM | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 |
| b | 0.15 | 0.21 | 0.27 |
| b1 | 0.25 | 0.31 | 0.37 |
| C | 0.07 | 0.12 | 0.17 |
| D | 1.15 | 1.20 | 1.25 |
| E | 0.75 | 0.80 | 0.85 |
| e | 0.40 BSC | | |
| H e | 1.15 | 1.20 | 1.25 |
| L | 0.29 REF | | |
| L2 | 0.15 | 0.20 | 0.25 |

RECOMMENDED 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.

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