Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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# 2SC5658M3T5G, 2SC5658RM3T5G

# NPN Silicon General Purpose Amplifier Transistor

This NPN 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 8 mm, 7−inch/3000 Unit Tape and Reel
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These are Pb−Free Devices

**MAXIMUM RATINGS** ($T_A$ = 25°C)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{(BR)CBO}$ | 50 | Vdc |
| Collector-Emitter Voltage | $V_{(BR)CEO}$ | 50 | Vdc |
| Emitter-Base Voltage | $V_{(BR)EBO}$ | 7.0 | Vdc |
| Collector Current − Continuous | $I_C$ | 150 | mAdc |

**THERMAL CHARACTERISTICS**

| Rating | Symbol | Max | Unit |
|---|---|---|---|
| Power Dissipation (Note 1) | $P_D$ | 260 | mW |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{stg}$ | −55 ~ +150 | °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.

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

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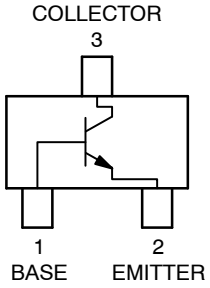
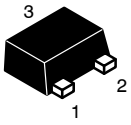
## NPN GENERAL PURPOSE AMPLIFIER TRANSISTORS SURFACE MOUNT




**MARKING DIAGRAM**




**SOT−723**
**CASE 631AA**


XX = Specific Device Code
(B9 = 2SC5658M3T5G
RM = 2SC5658RM3T5G)
M = Date Code

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| 2SC5658M3T5G | SOT−723 (Pb−Free) | 8000 / Tape & Reel |
| 2SC5658RM3T5G | SOT−723 (Pb−Free) | 8000 / Tape & Reel |
| NSV2SC5658M3T5G | 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.

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage ($I_C$ = 50 μAdc, $I_E$ = 0) | $V_{(BR)CBO}$ | 50 | – | – | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C$ = 1.0 mAdc, $I_B$ = 0) | $V_{(BR)CEO}$ | 50 | – | – | Vdc |
| Emitter-Base Breakdown Voltage ($I_E$ = 50 μAdc, $I_E$ = 0) | $V_{(BR)EBO}$ | 7.0 | – | – | Vdc |
| Collector-Base Cutoff Current ($V_{CB}$ = 30 Vdc, $I_E$ = 0) | $I_{CBO}$ | – | – | 0.5 | μA |
| Emitter-Base Cutoff Current ($V_{EB}$ = 4.0 Vdc, $I_B$ = 0) | $I_{EBO}$ | – | – | 0.5 | μA |
| Collector-Emitter Saturation Voltage (Note 2)<br>($I_C$ = 50 mAdc, $I_B$ = 5.0 mAdc) | $V_{CE(sat)}$ | – | – | 0.4 | Vdc |
| DC Current Gain (Note 2)<br>($V_{CE}$ = 6.0 Vdc, $I_C$ = 1.0 mAdc) 2SC5658M3T5G<br>($V_{CE}$ = 6.0 Vdc, $I_C$ = 1.0 mAdc) 2SC5658RM3T5G | $h_{FE}$ | <br>120<br>215 | <br>–<br>– | <br>560<br>375 | – |
| Transition Frequency ($V_{CE}$ = 12 Vdc, $I_C$ = 2.0 mAdc, f = 30 MHz) | $f_T$ | – | 180 | – | MHz |
| Output Capacitance ($V_{CB}$ = 12 Vdc, $I_C$ = 0 Adc, f = 1.0 MHz) | $C_{OB}$ | – | 2.0 | – | pF |

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.
*Include NSV−prefix devices where applicable.
2. Pulse Test: Pulse Width ≤ 300 μs, D.C. ≤ 2%.

## TYPICAL ELECTRICAL CHARACTERISTICS

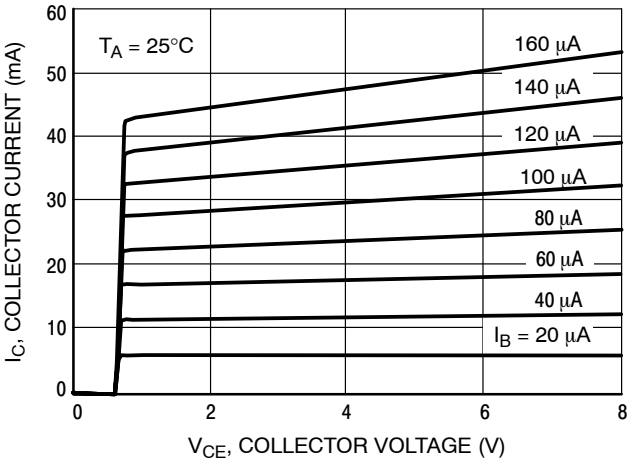



**Figure 1. $I_C - V_{CE}$**

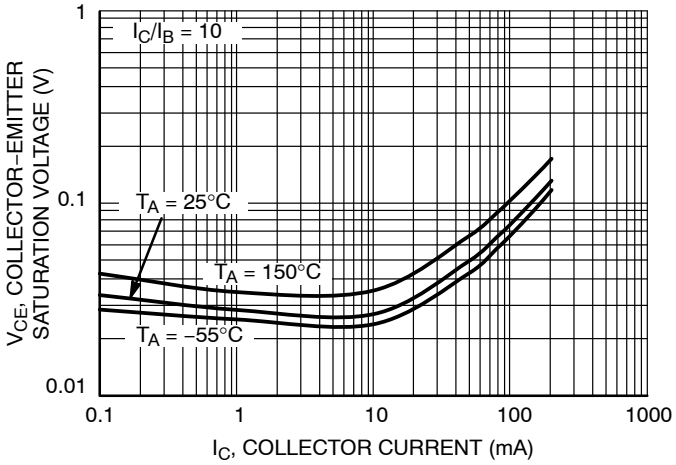



**Figure 2. Collector Emitter Saturation Voltage vs. Collector Current**

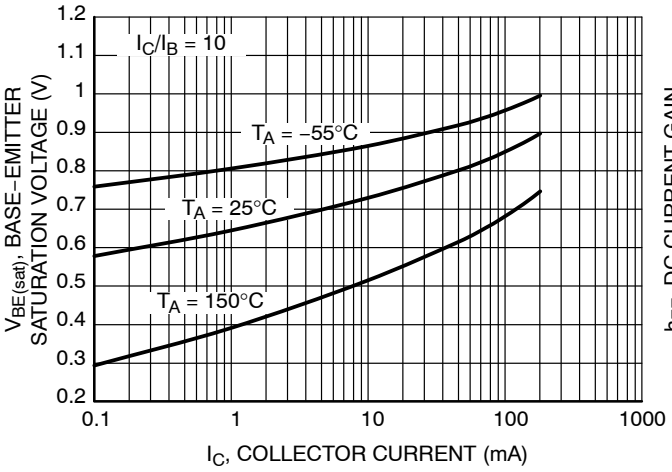



**Figure 3. Base Emitter Saturation Voltage vs. Collector Current**

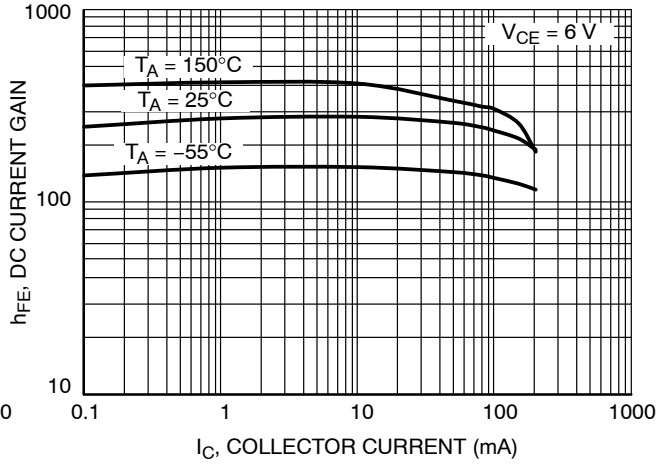



**Figure 4. DC Current Gain vs. Collector Current**

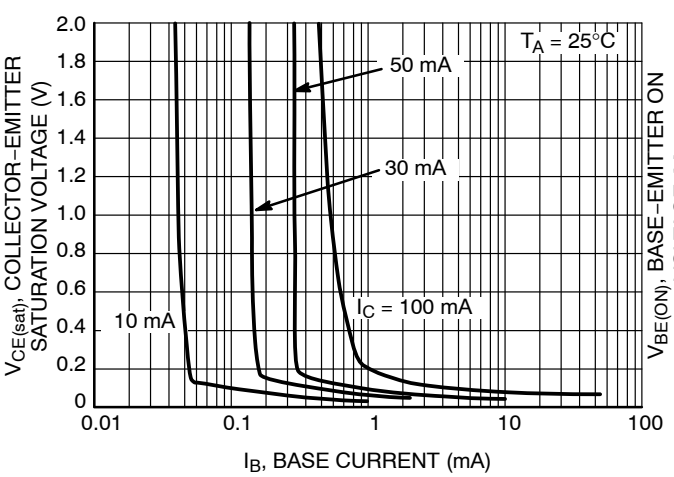



**Figure 5. Saturation Region**

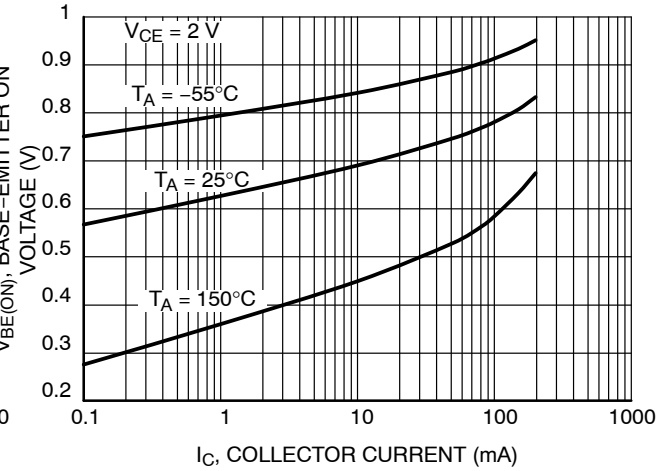



**Figure 6. Base−Emitter Turn−ON Voltage vs. Collector Current**

## TYPICAL ELECTRICAL CHARACTERISTICS

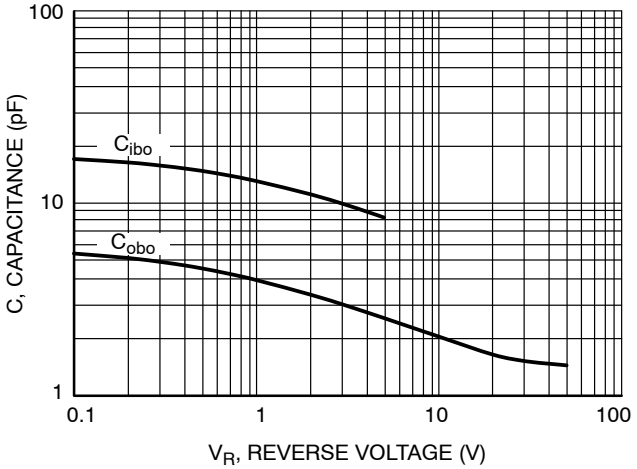



**Figure 7. Capacitance**

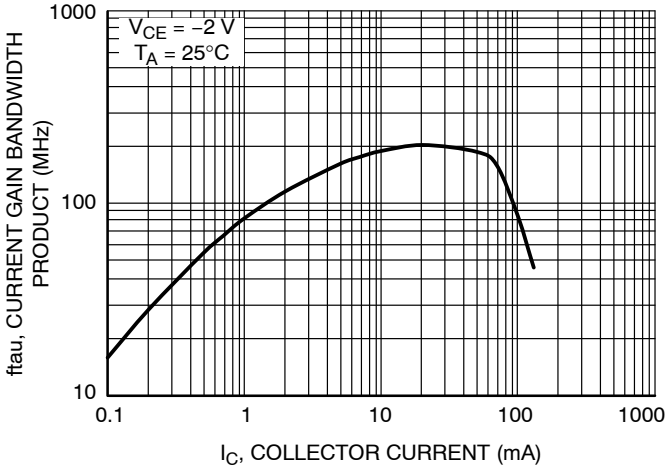



**Figure 8. Current Gain Bandwidth Product vs. Collector Current**

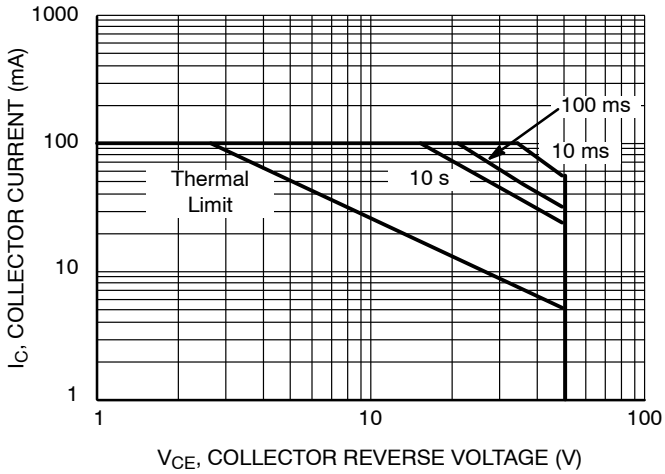
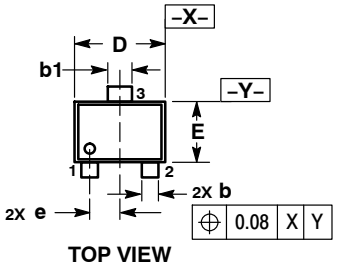


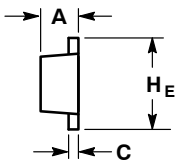

**Figure 9. Safe Operating Area**

## PACKAGE DIMENSIONS

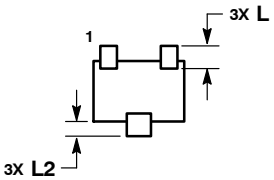
**SOT−723**
CASE 631AA
ISSUE D




TOP VIEW




SIDE VIEW

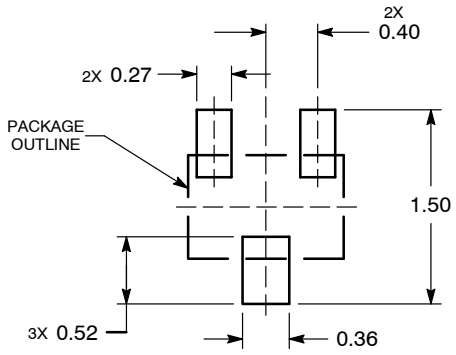



BOTTOM VIEW

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*




DIMENSIONS: MILLIMETERS

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



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