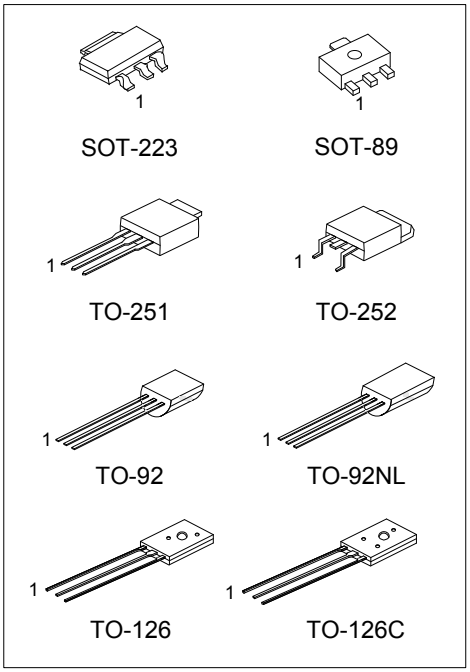
# 2SD669/A

**NPN SILICON TRANSISTOR**

## BIPOLAR POWER GENERAL PURPOSE TRANSISTOR




Lead-free: 2SD669L/2SD669AL
Halogen-free: 2SD669G/2SD669AG

### ■ APPLICATIONS

* Low frequency power amplifier complementary pair with UTC 2SB649/A

### ■ ORDERING INFORMATION

| Ordering Number | | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|---|
| Normal | Lead Free | Halogen Free | | 1 | 2 | 3 | |
| 2SD669x-x-AA3-R | 2SD669xL-x-AA3-R | 2SD669xG-x-AA3-R | SOT-223 | B | C | E | Tape Reel |
| 2SD669x-x-AB3-R | 2SD669xL-x-AB3-R | 2SD669xG-x-AB3-R | SOT-89 | B | C | E | Tape Reel |
| 2SD669x-x-T60-K | 2SD669xL-x-T60-K | 2SD669xG-x-T60-K | TO-126 | E | C | B | Bulk |
| 2SD669x-x-T6C-K | 2SD669xL-x-T6C-K | 2SD669xG-x-T6C-K | TO-126C | E | C | B | Bulk |
| 2SD669x-x-T92-B | 2SD669xL-x-T92-B | 2SD669xG-x-T92-B | TO-92 | E | C | B | Tape Box |
| 2SD669x-x-T92-K | 2SD669xL-x-T92-K | 2SD669xG-x-T92-K | TO-92 | E | C | B | Bulk |
| 2SD669x-x-T9N-B | 2SD669xL-x-T9N-B | 2SD669xG-x-T9N-B | TO-92NL | E | C | B | Tape Box |
| 2SD669x-x-T9N-K | 2SD669xL-x-T9N-K | 2SD669xG-x-T9N-K | TO-92NL | E | C | B | Bulk |
| 2SD669x-x-TM3-T | 2SD669xL-x-TM3-T | 2SD669xG-x-TM3-T | TO-251 | B | C | E | Tube |
| 2SD669x-x-TN3-R | 2SD669xL-x-TN3-R | 2SD669xG-x-TN3-R | TO-252 | B | C | E | Tape Reel |

2SD669xL-x-AB3-R
(1)Packing Type
(2)Package Type
(3)Rank
(4)Lead Plating
(5) Collector-Emitter Voltage

(1) B: Tape Box, K: Bulk, R: Tape Reel
(2) AA3: SOT-223, AB3: SOT-89, T60: TO-126, T6C: TO-126C, TM3: TO-251, TN3: TO-252, T92:TO-92, T9N: TO-92NL
(3) x: refer to Classification of $h_{FE1}$
(4) G: Halogen Free, L: Lead Free, Blank: Pb/Sn
(5) A: 160V, Blank: 120V


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## ■ ABSOLUTE MAXIMUM RATING (Ta=25°C unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 180 | V |
| Collector-Emitter Voltage | 2SD669 | $V_{CEO}$ | 120 | V |
| | 2SD669A | | 160 | |
| Emitter-Base Voltage | | $V_{EBO}$ | 5 | V |
| Collector Current | | $I_C$ | 1.5 | A |
| Collector Peak Current | | $I_{C(PEAK)}$ | 3 | A |
| Collector Dissipation | SOT-223 | $P_D$ | 0.5 | W |
| | SOT-89 | | 0.5 | W |
| | TO-126/TO-126C | | 1 | W |
| | TO-92/TO-92NL | | 0.6 | W |
| | TO-251 | | 1 | W |
| | TO-252 | | 2 | W |
| Junction Temperature | | $T_J$ | 150 | °C |
| Storage Temperature | | $T_{STG}$ | -40 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Collector to Base Breakdown Voltage | | $BV_{CBO}$ | $I_C$=1mA, $I_E$=0 | 180 | | | V |
| Collector to Emitter Breakdown Voltage | 2SD669 | $BV_{CEO}$ | $I_C$=10mA, $R_{BE}$=∞ | 120 | | | V |
| | 2SD669A | | | 160 | | | |
| Emitter to Base Breakdown Voltage | | $BV_{EBO}$ | $I_E$=1mA, $I_C$=0 | 5 | | | V |
| Collector Cut-off Current | | $I_{CBO}$ | $V_{CB}$=160V, $I_E$=0 | | | 10 | μA |
| DC Current Gain | | $h_{FE1}$ | $V_{CE}$=5V, $I_C$=150mA (Note) | 60 | | 320 | |
| | | $h_{FE2}$ | $V_{CE}$=5V, $I_C$=500mA (Note) | 30 | | | |
| Collector-Emitter Saturation Voltage | | $V_{CE(SAT)}$ | $I_C$=600mA, $I_B$=50mA (Note) | | | 1 | V |
| Base-Emitter Voltage | | $V_{BE}$ | $V_{CE}$=5V, $I_C$=150mA (Note) | | | 1.5 | V |
| Current Gain Bandwidth Product | | $f_T$ | $V_{CE}$=5V, $I_C$=150mA (Note) | | 140 | | MHz |
| Output Capacitance | | $C_{ob}$ | $V_{CB}$=10V, $I_E$=0, f=1MHz | | 14 | | pF |

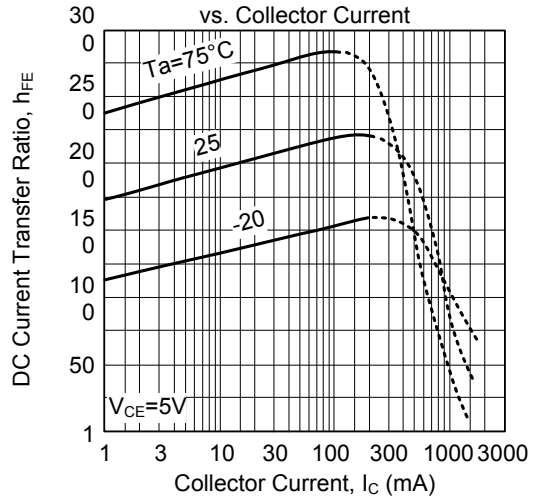
Note: Pulse test.

## ■ CLASSIFICATION OF $h_{FE1}$

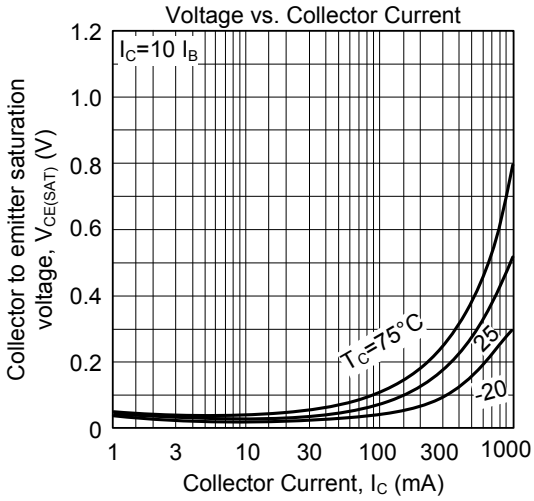
| RANK | B | C | D |
|---|---|---|---|
| RANGE | 60-120 | 100-200 | 160-320 |

## ■ TYPICAL CHARACTERISTICS

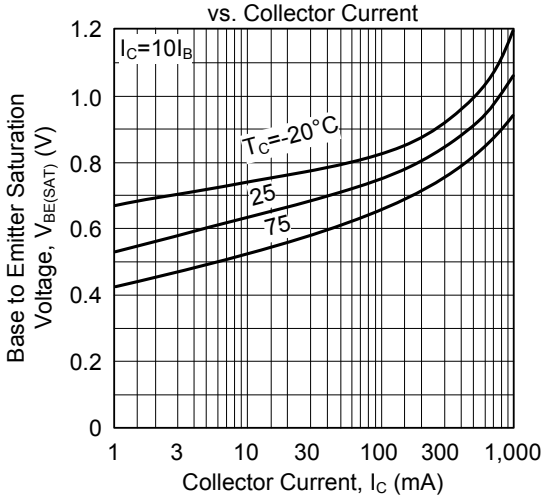
DC Current Transfer Ratio vs. Collector Current



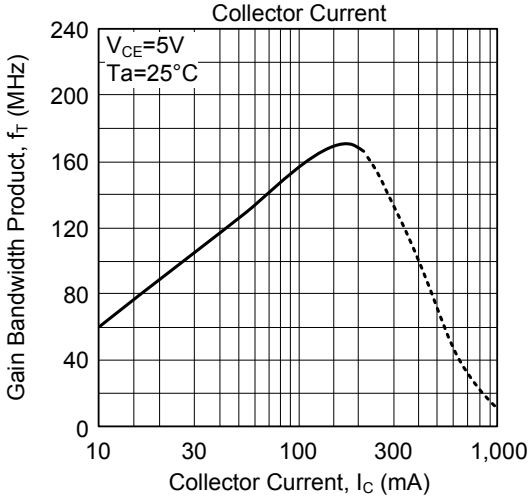

Collector to Emitter Saturation Voltage vs. Collector Current



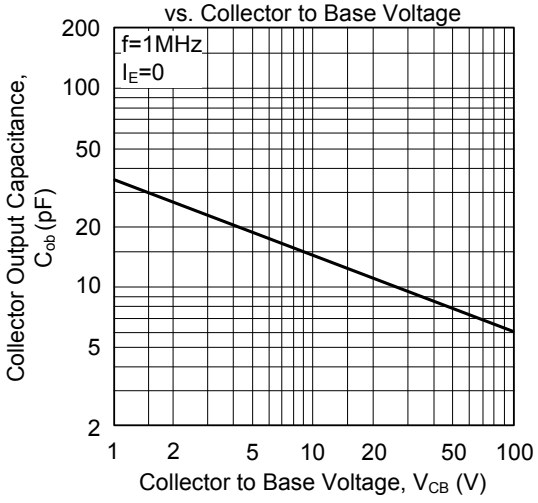

Base to Emitter Saturation Voltage vs. Collector Current



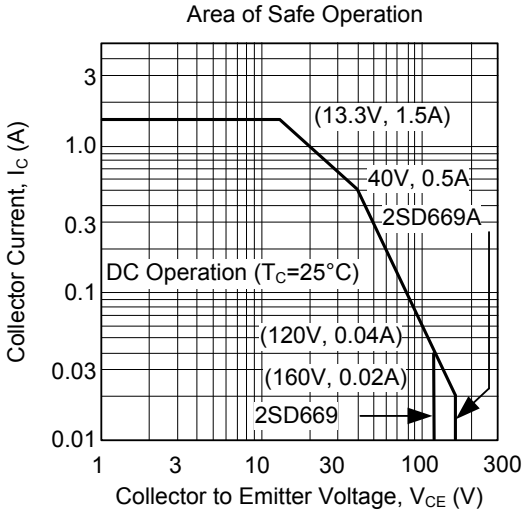

Gain Bandwidth Product vs. Collector Current



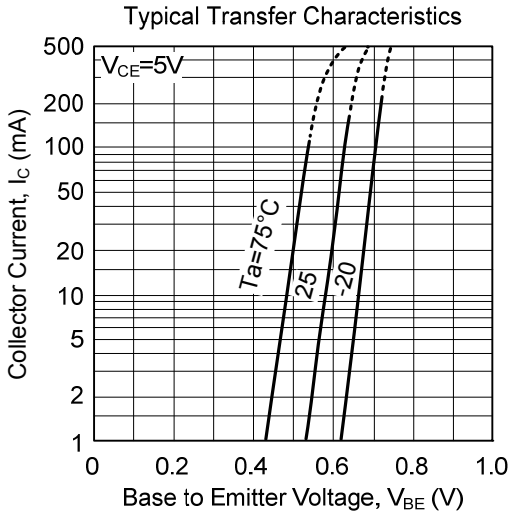

Collector Output Capacitance vs. Collector to Base Voltage




Area of Safe Operation



■ TYPICAL CHARACTERISTICS(Cont.)




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