

# 2SA1602

FOR LOW FREQUENCY AMPLIFY APPLICATION  
SILICON PNP EPITAXIAL TYPE(Super mini type)

## DESCRIPTION

2SA1602 is a super mini package resin sealed  
silicon PNP epitaxial transistor,  
It is designed for low frequency voltage application.

## FEATURE

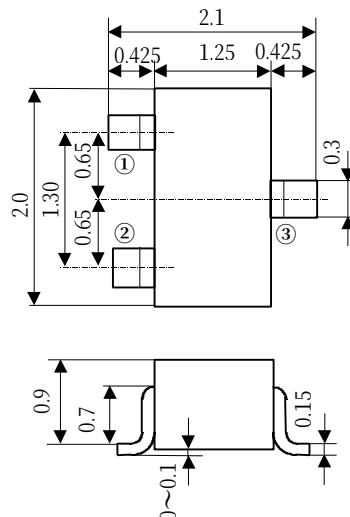
- Small collector to emitter saturation voltage.  
 $V_{CE(sat)} = -0.3V$  max
- Excellent linearity of DC forward gain.
- Super mini package for easy mounting

## APPLICATION

For Hybrid IC, small type machine low frequency voltage  
Amplify application.

## OUTLINE DRAWING

Unit: mm



JEITA: SC-70

## TERMINAL CONNECTER

- ①: BASE  
②: EMITTER  
③: COLLECTOR

## MAXIMUM RATINGS (Ta=25°C)

| Symbol    | Parameter                    | Ratings  | Unit |
|-----------|------------------------------|----------|------|
| $V_{CBO}$ | Collector to Base voltage    | -50      | V    |
| $V_{CEO}$ | Collector to Emitter voltage | -50      | V    |
| $V_{EBO}$ | Emitter to Base voltage      | -6       | V    |
| $I_O$     | Collector current            | -200     | mA   |
| $P_C$     | Collector dissipation        | 150      | mW   |
| $T_j$     | Junction temperature         | +125     | °C   |
| $T_{stg}$ | Storage temperature          | -55~+125 | °C   |

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

| Parameter                    | Symbol        | Test conditions                     | Limits |     |      | Unit    |
|------------------------------|---------------|-------------------------------------|--------|-----|------|---------|
|                              |               |                                     | Min    | Typ | Max  |         |
| C to E break down voltage    | $V(BR)_{CEO}$ | $I_C = -100 \mu A, R_{BE} = \infty$ | -50    | -   | -    | V       |
| Collector cut off current    | $I_{CBO}$     | $V_{CB} = -50V, I_E = 0mA$          | -      | -   | -0.1 | $\mu A$ |
| Emitter cut off current      | $I_{EBO}$     | $V_{EB} = -6V, I_C = 0mA$           | -      | -   | -0.1 | $\mu A$ |
| DC forward current gain      | hFE           | $V_{CE} = -6V, I_C = -1mA$ ※        | 150    | -   | 800  |         |
| DC forward current gain      | hFE           | $V_{CE} = -6V, I_C = -0.1mA$        | 90     | -   | -    |         |
| C to E Saturation Voltage    | $V_{CE(sat)}$ | $I_C = -100mA, I_B = -10mA$         | -      | -   | -0.3 | V       |
| Gain bandwidth product       | fT            | $V_{CE} = -6V, I_E = -10mA$         | -      | 200 | -    | MHz     |
| Collector output capacitance | Cob           | $V_{CB} = -6V, I_E = 0, f = 1MHz$   | -      | 4.0 | -    | pF      |

※ It shows hFE classification in below table.

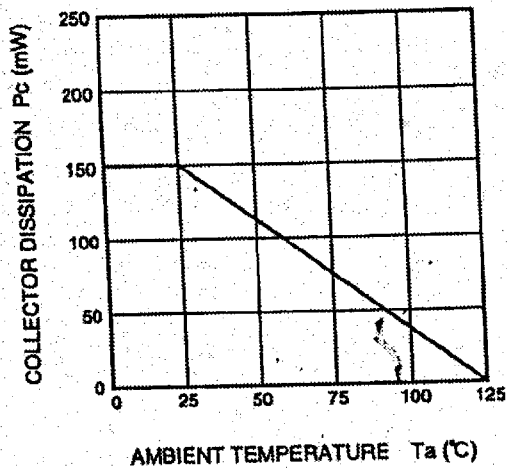
| Item     | E       | F       | G       |
|----------|---------|---------|---------|
| hFE Item | 150~300 | 250~500 | 400~800 |

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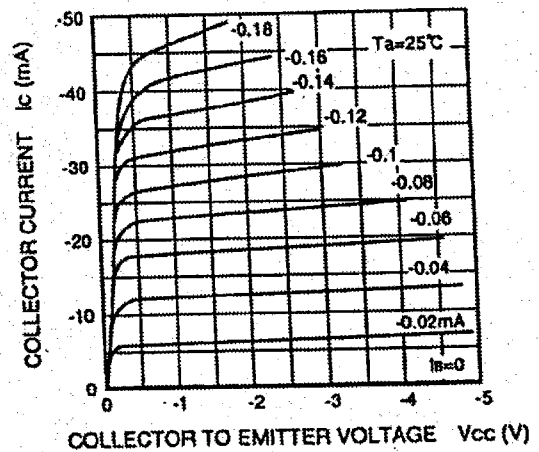
For Low Frequency Amplify Application  
Silicon PNP Epitaxial Type (Super Mini type)

## TYPICAL CHARACTERISTICS

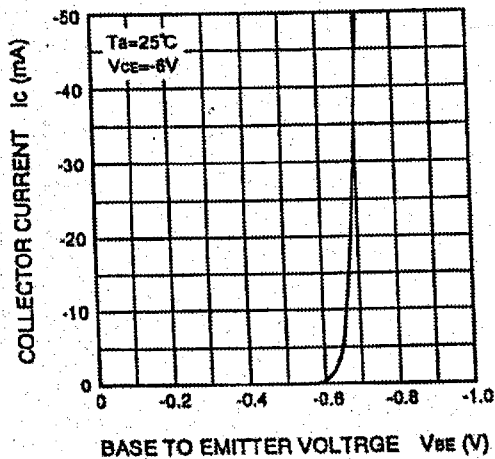
COLLECTOR DISSIPATION  
VS. AMBIENT TEMPERATURE



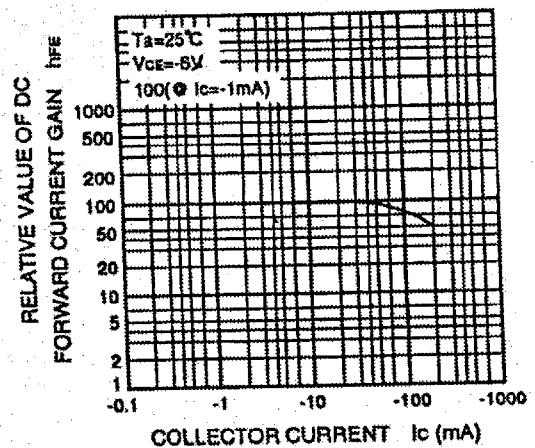
COMMON EMITTER OUTPUT



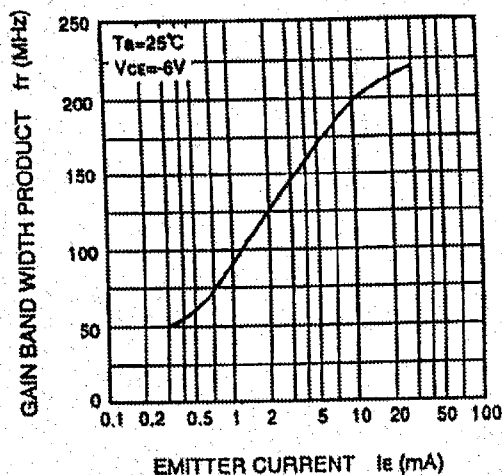
COMMON EMITTER TRANSFER



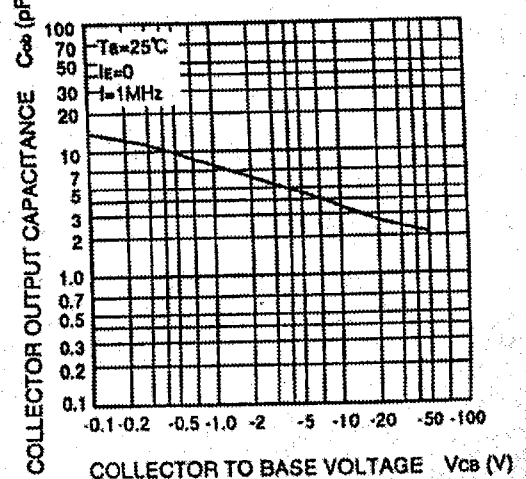
DC FORWARD CURRENT GAIN  
VS. COLLECTOR CURRENT



GAIN BAND WIDTH PRODUCT  
VS. EMITTER CURRENT



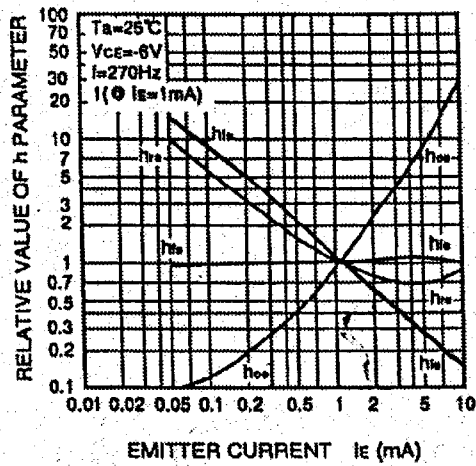
COLLECTOR OUTPUT CAPACITANCE  
VS. COLLECTOR TO BASE VOLTAGE



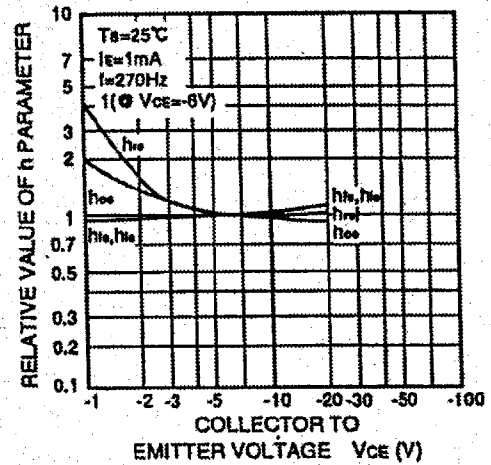
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h PARAMETER VS.  
EMITTER CURRENT



h PARAMETER VS.  
COLLECTOR TO EMITTER VOLTAGE



## COMMON EMITTER h PARAMETER (TYPICAL VALUE)

| Symbol   | Parameter                                                     | Test conditions                                                                               | Limits | Unit             |
|----------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------|------------------|
| $h_{ie}$ | Closed loop small signal input impedance                      | $T_a = 25^\circ\text{C}$<br>$V_{CE} = -6\text{V}$<br>$I_E = 1\text{mA}$<br>$f = 270\text{Hz}$ | 7.0    | $k\Omega$        |
| $h_{re}$ | Open loop small signal reverse voltage amplification factor   |                                                                                               | 0.1    | $\times 10^{-3}$ |
| $h_{fe}$ | Closed loop small signal forward current amplification factor |                                                                                               | 250    | —                |
| $h_{oe}$ | Open loop small signal output admittance                      |                                                                                               | 16     | $\mu\text{S}$    |



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