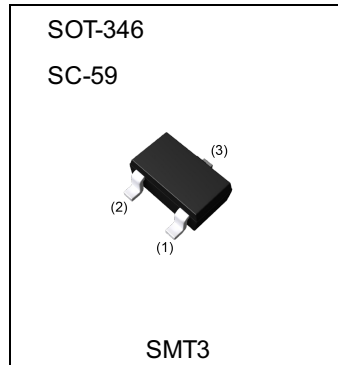


| Parameter | Value |
|-----------|-------------|
| V_{CES} | 32V |
| I_C | 0.3A |
| R | 4k Ω |

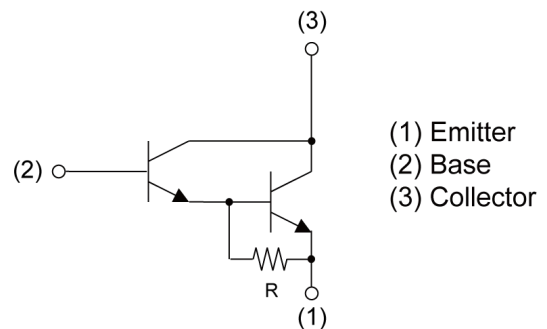
●Outline



●Features

- 1)Darlington connection for high DC current gain.
- 2)Built-in 4k Ω resistor between base and emitter.
- 3)Complements the 2SB852K.

●Inner circuit



●Application

HIGH GAIN AMPLIFIER

●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|----------|----------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| 2SD1383K | SOT-346 (SMT3) | 2928 | T146 | 180 | 8 | 3000 | W |

● **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Values | Unit |
|------------------------------|----------------------|-------------|------------------|
| Collector-base voltage | V_{CBO} | 40 | V |
| Collector-emitter voltage | V_{CES} | 32 | V |
| Emitter-base voltage | V_{EBO} | 6 | V |
| Collector current | I_{C} | 0.3 | A |
| | I_{CP}^{*1} | 1.5 | A |
| Power dissipation | P_{D}^{*2} | 200 | mW |
| Junction temperature | T_{j} | 150 | $^\circ\text{C}$ |
| Range of storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

● **Electrical characteristics** ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------------------------|---------------------------|---|--------|------|------|---------------|
| | | | Min. | Typ. | Max. | |
| Collector-base breakdown voltage | BV_{CBO} | $I_{\text{C}} = 100\mu\text{A}$ | 40 | - | - | V |
| Collector-emitter breakdown voltage | BV_{CES} | $I_{\text{C}} = 1\text{mA}, R_{\text{BE}} = 0\Omega$ | 32 | - | - | V |
| Emitter-base breakdown voltage | BV_{EBO} | $I_{\text{E}} = 100\mu\text{A}$ | 6 | - | - | V |
| Collector cut-off current | I_{CBO} | $V_{\text{CB}} = 24\text{V}$ | - | - | 1.0 | μA |
| Emitter cut-off current | I_{EBO} | $V_{\text{EB}} = 4.5\text{V}$ | - | - | 1.0 | μA |
| Collector-emitter saturation voltage | $V_{\text{CE(sat)}}^{*3}$ | $I_{\text{C}} = 200\text{mA}, I_{\text{B}} = 0.4\text{mA}$ | - | - | 1.5 | V |
| DC current gain | h_{FE}^{*3} | $V_{\text{CE}} = 5\text{V}, I_{\text{C}} = 100\text{mA}$ | 1k | - | - | - |
| Transition frequency | f_{T}^{*4} | $V_{\text{CE}} = 5\text{V}, I_{\text{E}} = -10\text{mA}, f = 100\text{MHz}$ | - | 250 | - | MHz |
| Output capacitance | C_{ob} | $V_{\text{CB}} = 10\text{V}, I_{\text{E}} = 0\text{A}, f = 1\text{MHz}$ | - | 3.0 | - | pF |

h_{FE} values are classified as follows :

| rank | A | B | - | - | - |
|-----------------|-----|-----|---|---|---|
| h_{FE} | 1k- | 5k- | - | - | - |

*1 $P_{\text{w}}=10\text{ms}$, duty=1/15

*2 Each terminal mounted on a reference land

*3 Pulsed

*4 Characteristics of built-in transistor

● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.1 Ground emitter propagation characteristics

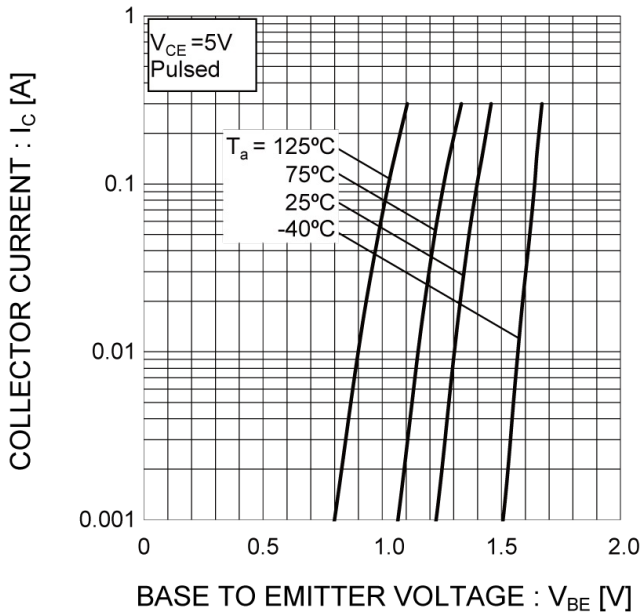


Fig.2 Grounded emitter output characteristics

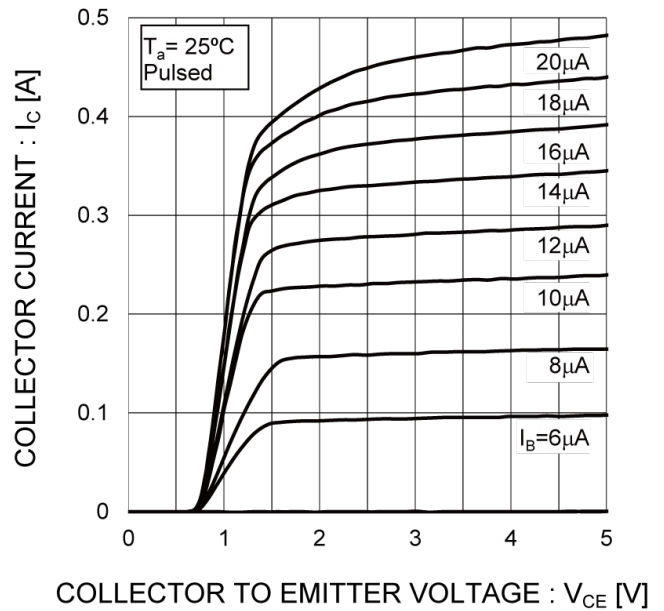


Fig.3 DC current gain vs. collector current (I)

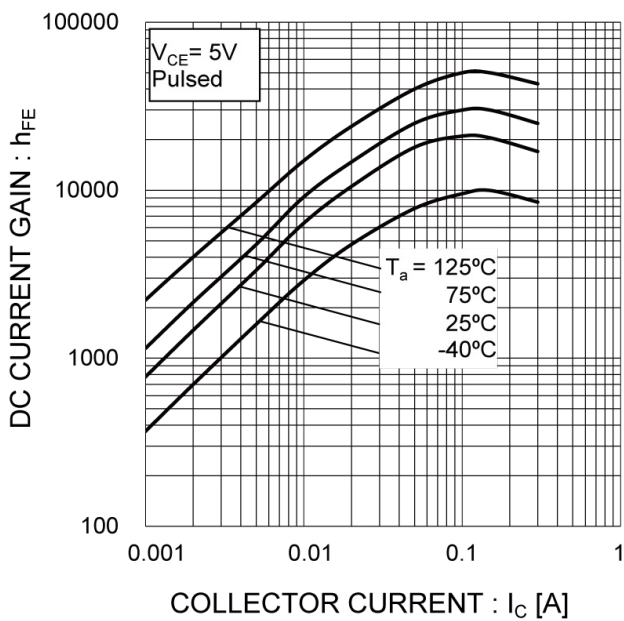
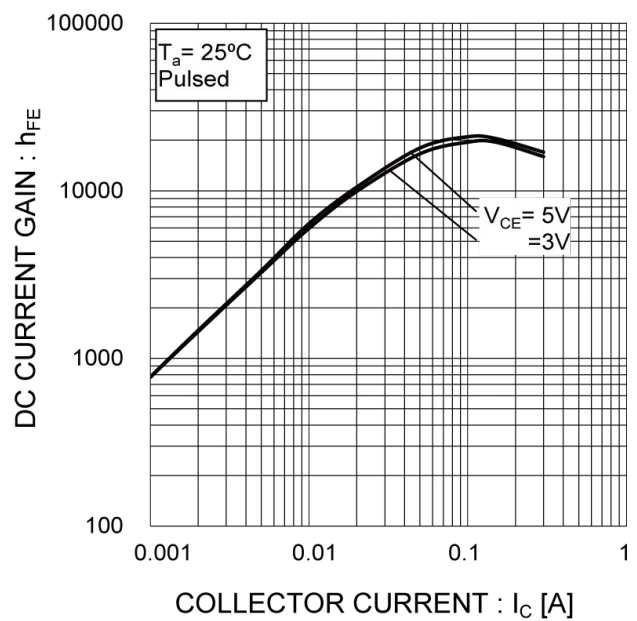


Fig.4 DC current gain vs. collector current (II)



● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.5 Collector-emitter saturation voltage vs. collector current (I)

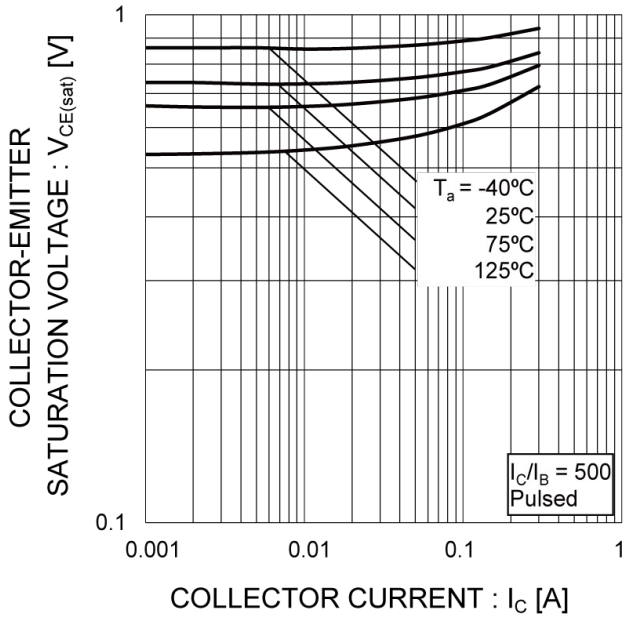


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

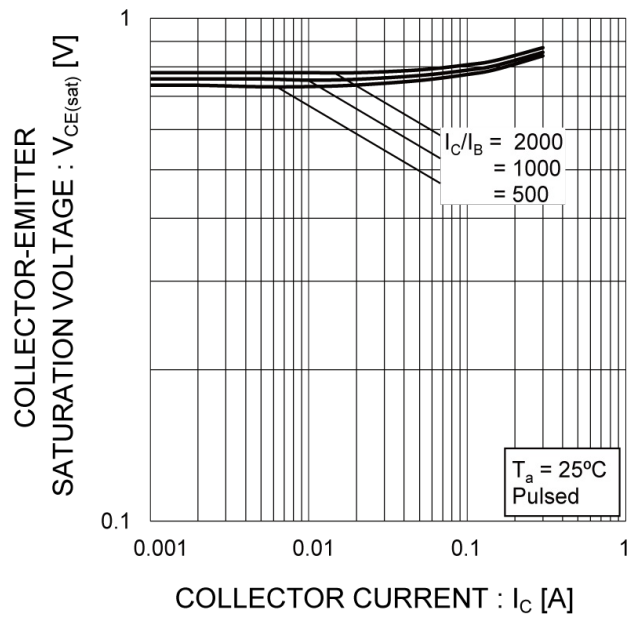
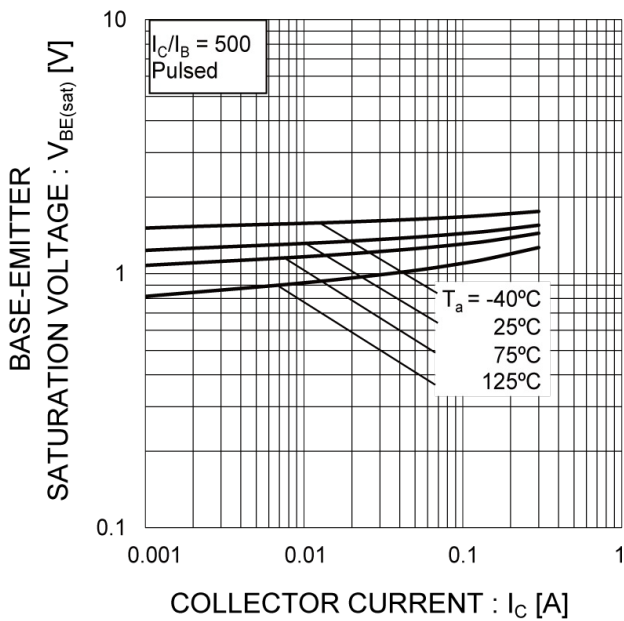


Fig.7 Base-emitter saturation voltage vs. collector current (I)



● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.8 Collector output capacitance vs. collector-base voltage

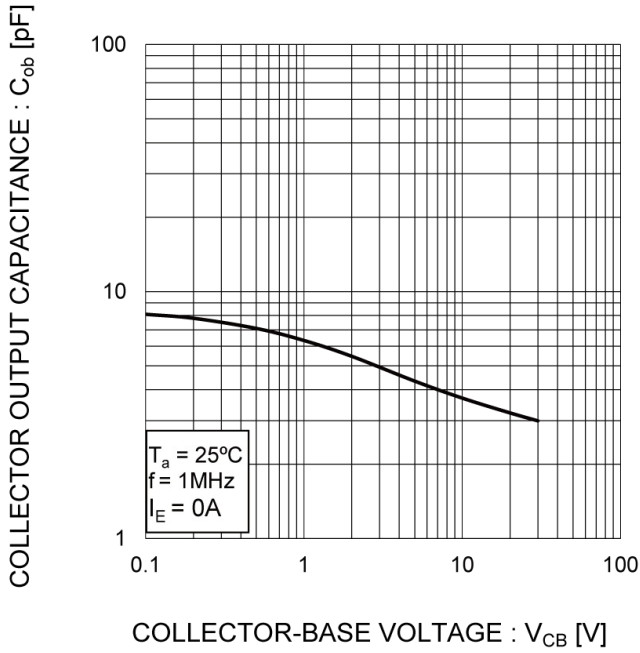


Fig.9 Emitter input capacitance vs. emitter-base voltage

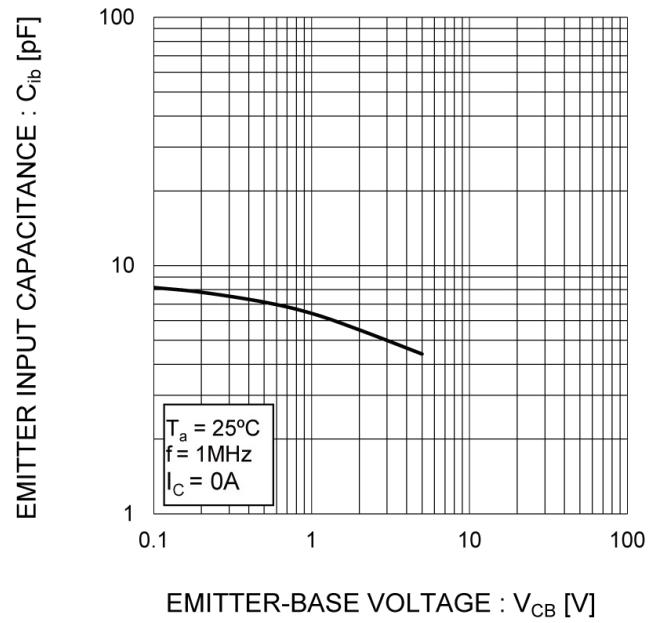
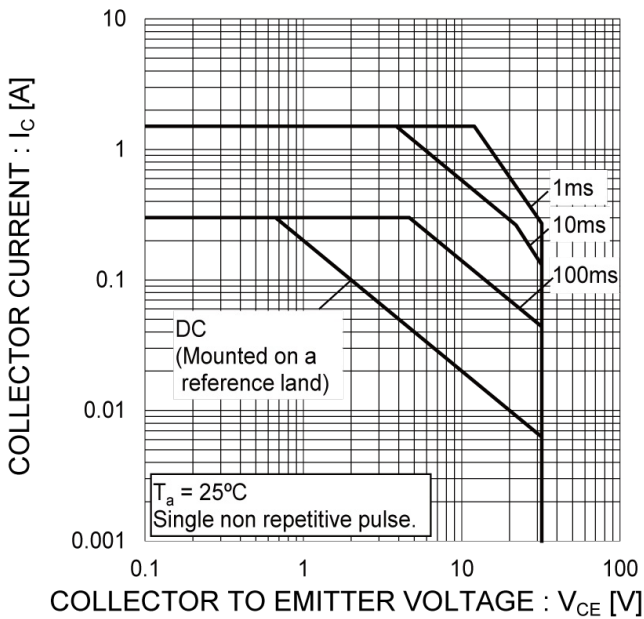


Fig.10 Safe operating area



●Dimensions

SOT-346
SC-59
(SMT3)



Pattern of terminal position areas
[Not a pattern of soldering pads]

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.00 | 1.30 | 0.039 | 0.051 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.35 | 0.50 | 0.014 | 0.020 |
| c | 0.09 | 0.25 | 0.004 | 0.010 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.50 | 1.80 | 0.059 | 0.071 |
| e | 0.95 | | 0.037 | |
| HE | 2.60 | 3.00 | 0.102 | 0.118 |
| L1 | 0.30 | 0.60 | 0.012 | 0.024 |
| Lp | 0.40 | 0.70 | 0.016 | 0.028 |
| Q | 0.20 | 0.30 | 0.008 | 0.012 |
| x | - | 0.10 | - | 0.004 |
| y | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.60 | - | 0.024 |
| e1 | 2.10 | | 0.083 | |
| l1 | - | 0.90 | - | 0.035 |

Dimension in mm/inches

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(Note1) Medical Equipment Classification of the Specific Applications

| JAPAN | USA | EU | CHINA |
|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | CLASS III |
| CLASS IV | | CLASS III | |

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 - Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
 - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
 - Sealing or coating our Products with resin or other coating materials
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 - Use of the Products in places subject to dew condensation
- The Products are not subject to radiation-proof design.
- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
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 - [b] the temperature or humidity exceeds those recommended by ROHM
 - [c] the Products are exposed to direct sunshine or condensation
 - [d] the Products are exposed to high Electrostatic
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