

## For Muting (20V, 0.3A)

## 2SD2704K / 2SD2705S

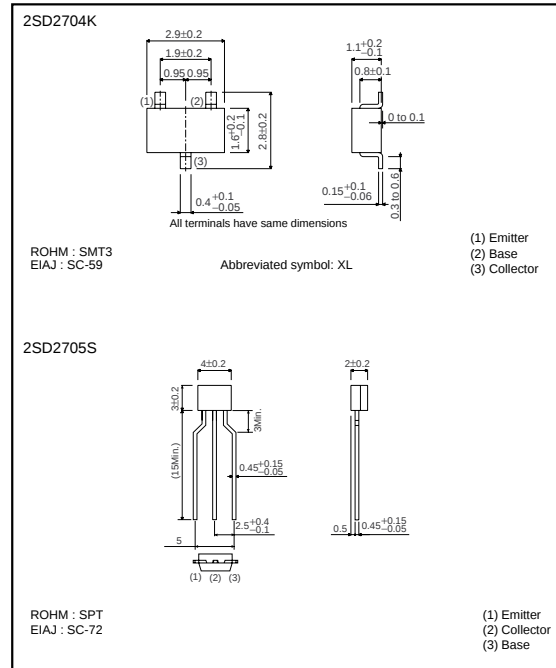
## ●Features

- 1) High DC current gain.  
 $h_{FE} = 820$  to  $2700$
- 2) High emitter-base voltage.  
 $V_{EBO} = 25V$  (Min.)
- 3) Low  $R_{on}$   
 $R_{on} = 0.7\Omega$  (Typ.)

## ●Structure

Epitaxial planar type  
NPN silicon transistor

## ●External dimensions (Unit : mm)

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

| Parameter                   | Symbol    | Limits      | Unit             |
|-----------------------------|-----------|-------------|------------------|
| Collector-base voltage      | $V_{CBO}$ | 50          | V                |
| Collector-emitter voltage   | $V_{CEO}$ | 20          | V                |
| Emitter-base voltage        | $V_{EBO}$ | 25          | V                |
| Collector current           | $I_C$     | 0.3         | A                |
| Collector power dissipation | 2SD2704K  | $P_C$       | 0.2              |
|                             | 2SD2705S  |             |                  |
| Junction temperature        | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature         | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

## Transistors

## ●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit     | Conditions                        |
|--------------------------------------|---------------|------|------|------|----------|-----------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | 50   | —    | —    | V        | $I_C=10\mu A$                     |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 20   | —    | —    | V        | $I_C=1mA$                         |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 25   | —    | —    | V        | $I_E=10\mu A$                     |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | 0.1  | $\mu A$  | $V_{CB}=50V$                      |
| Emitter cutoff current               | $I_{EBO}$     | —    | —    | 0.1  | $\mu A$  | $V_{EB}=25V$                      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | 50   | 100  | mV       | $I_C/I_B=30mA/3mA$                |
| DC current transfer ratio            | $h_{FE}$      | 820  | —    | 2700 | —        | $V_{CE}=2V, I_C=4mA$              |
| Transition frequency                 | $f_T^*$       | —    | 35   | —    | MHz      | $V_{CE}=6V, I_E=-4mA, f=10MHz$    |
| Output capacitance                   | $C_{ob}$      | —    | 3.9  | —    | pF       | $V_{CB}=10V, I_E=0A, f=1MHz$      |
| Output On-resistance                 | $R_{on}$      | —    | 0.7  | —    | $\Omega$ | $I_B=5mA, V_i=100mV(rms), f=1kHz$ |

\* Measured using pulse current

## ●Packaging specifications and hFE

| Type     | Package                      | Taping |      |
|----------|------------------------------|--------|------|
|          | Code                         | T146   | TP   |
|          | Basic ordering unit (pieces) | 3000   | 5000 |
| 2SD2704K |                              | ○      | —    |
| 2SD2705S |                              | —      | ○    |

## ●Electrical characteristic curves

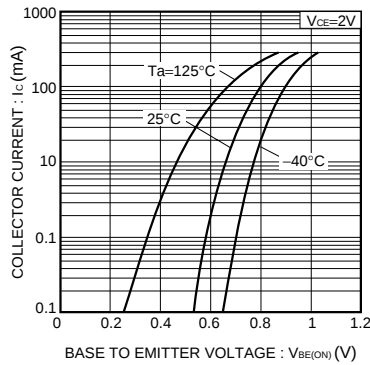


Fig.1 Grounded emitter propagation characteristics ( I )

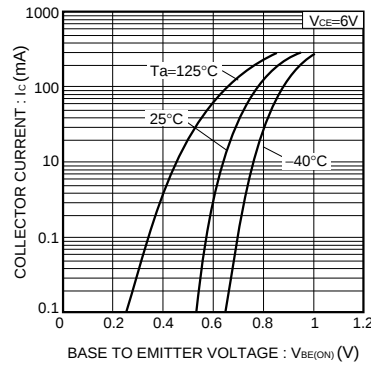


Fig.2 Grounded emitter propagation characteristics ( II )

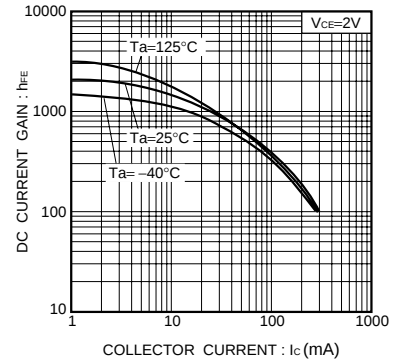


Fig.3 DC current gain vs. collector current ( I )

## Transistors

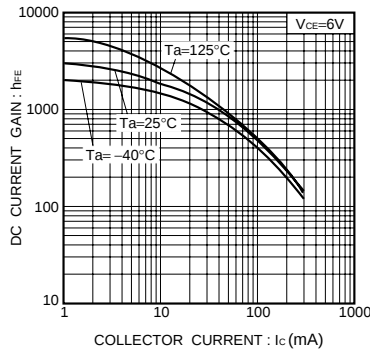


Fig. 4 DC current gain vs. collector current (II)

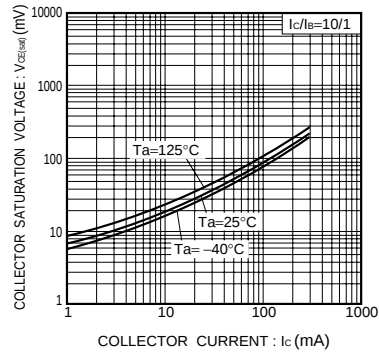


Fig. 5 Collector-emitter saturation voltage vs. collector current (I)

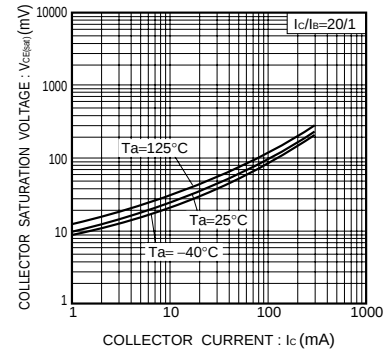


Fig. 6 Collector-emitter saturation voltage vs. collector current (II)

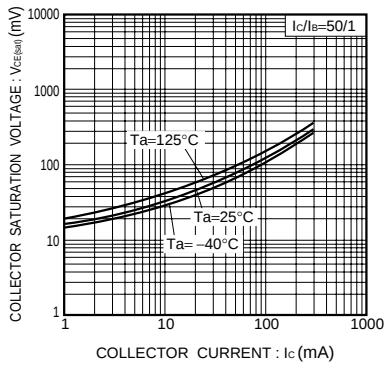


Fig. 7 Collector-emitter saturation voltage vs. collector current (III)

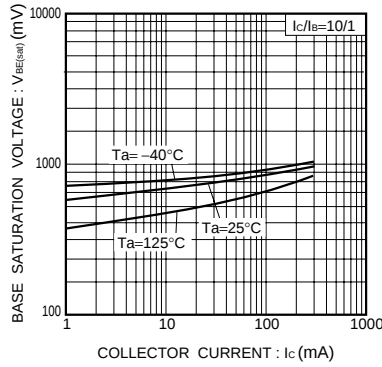


Fig. 8 Base-emitter saturation voltage vs. collector current (I)

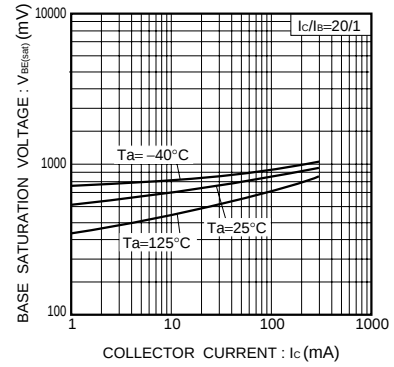


Fig. 9 Base-emitter saturation voltage vs. collector current (II)

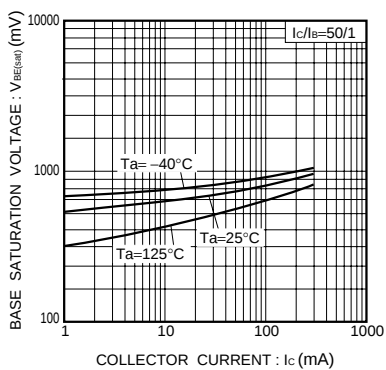


Fig. 10 Base-emitter saturation voltage vs. collector current (III)

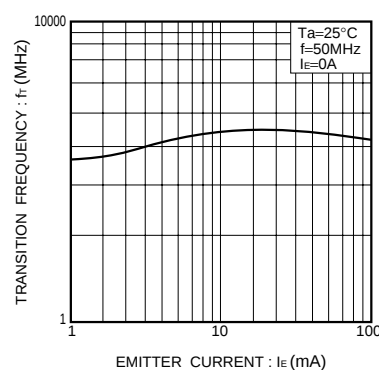
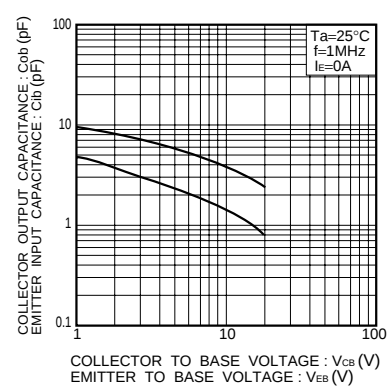


Fig. 11 Gain bandwidth product vs. emitter current

Fig. 12 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

## Transistors

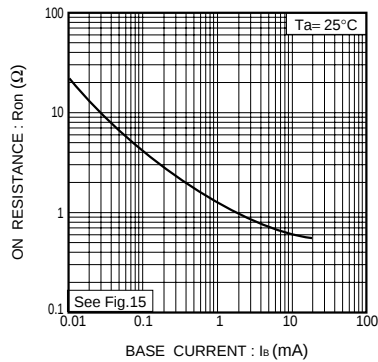


Fig.13 Output-on resistance vs. base current ( I )

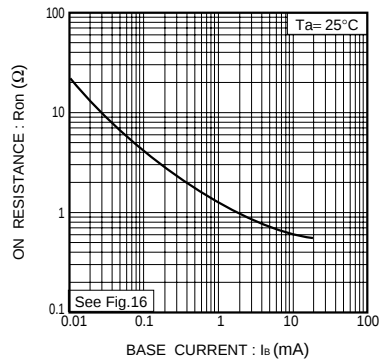
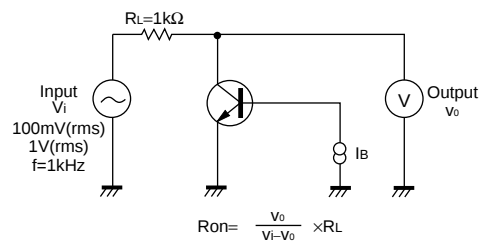
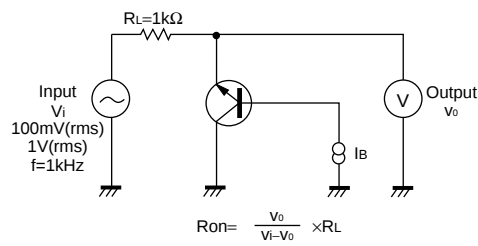


Fig.14 Output-on resistance vs. base current ( II )

● $R_{on}$  measurement circuitFig.15  $R_{on}$  measurement circuit ( I )Fig.16  $R_{on}$  measurement circuit ( II )

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