# For Muting (20V, 0.3A)

## 2SD2704K / 2SD2705S

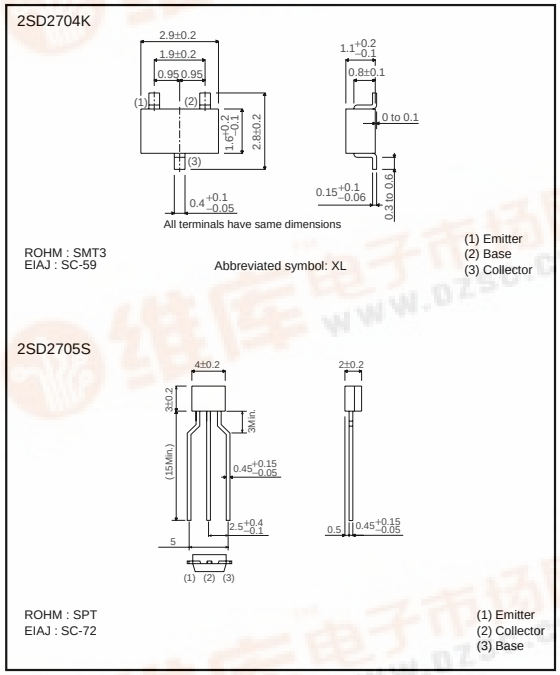
### ●Features

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

### ●Structure

Epitaxial planar type
NPN silicon transistor

### ●External dimensions (Unit : mm)




* Denotes $h_{FE}$

### ●Absolute maximum ratings (Ta=25°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 | W |
| | 2SD2705S | | 0.3 | |
| Junction temperature | | Tj | 150 | °C |
| Storage temperature | | Tstg | −55 to +150 | °C |

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | 50 | – | – | V | $I_C$=10μA |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | 20 | – | – | V | $I_C$=1mA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | 25 | – | – | V | $I_E$=10μA |
| Collector cutoff current | $I_{CBO}$ | – | – | 0.1 | μA | $V_{CB}$=50V |
| Emitter cutoff current | $I_{EBO}$ | – | – | 0.1 | μA | $V_{EB}$=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 | Cob | – | 3.9 | – | pF | $V_{CB}$=10V, $I_E$=0A, f=1MHz |
| Output On-resistance | Ron | – | 0.7 | – | Ω | $I_B$=5mA, Vi=100mV(rms), f=1kHz |

* Measured using pulse current

●**Packaging specifications and $h_{FE}$**

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

●**Electrical characteristic curves**

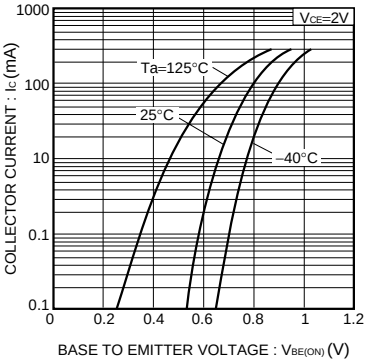



Fig.1 Grounded emitter propagation characteristics ( I )

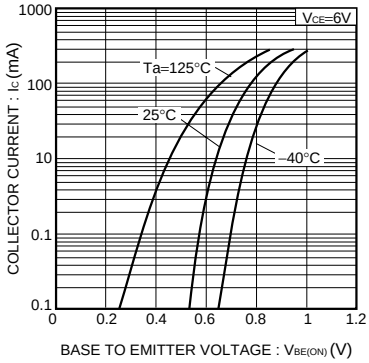



Fig.2 Grounded emitter propagation characteristics ( II )

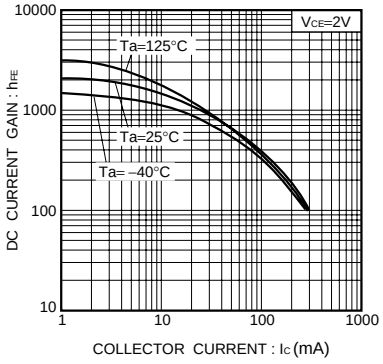



Fig.3 DC current gain vs. collector current ( I )

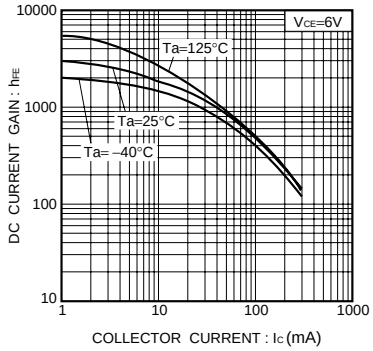



Fig.4 DC current gain vs. collector current ( II )

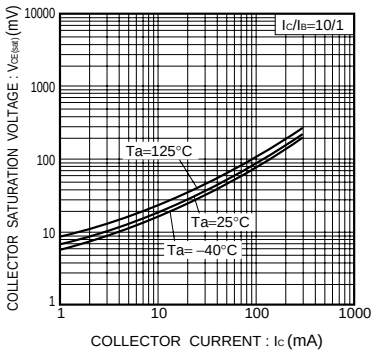



Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

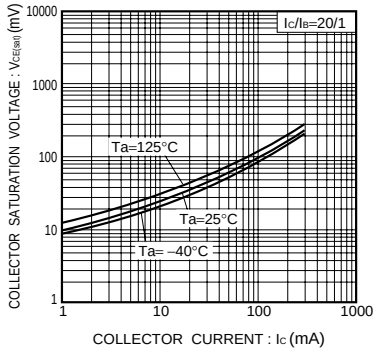



Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

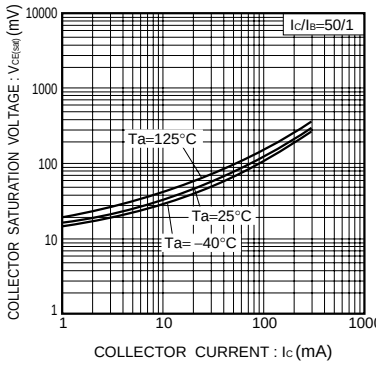



Fig.7 Collector-emitter saturation voltage vs. collector current ( III )

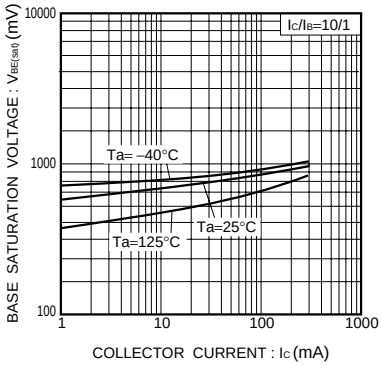



Fig.8 Base-emitter saturation voltage vs. collector current ( I )

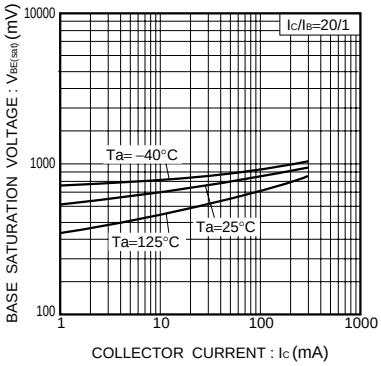



Fig.9 Base-emitter saturation voltage vs. collector current ( II )

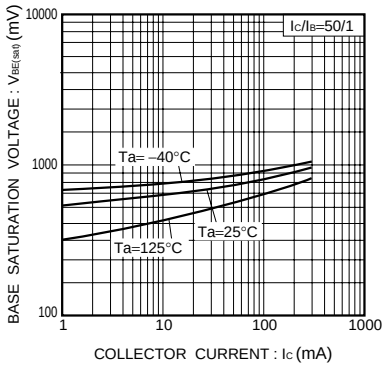



Fig.10 Base-emitter saturation voltage vs. collector current ( III )

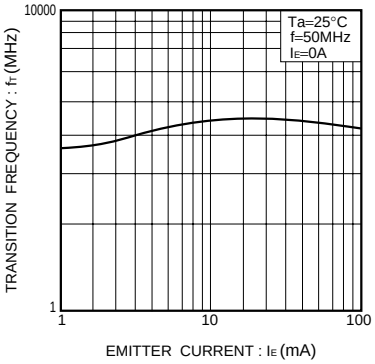



Fig.11 Gain bandwidth product vs. emitter current

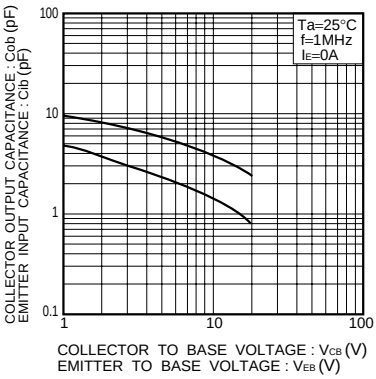



Fig.12 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

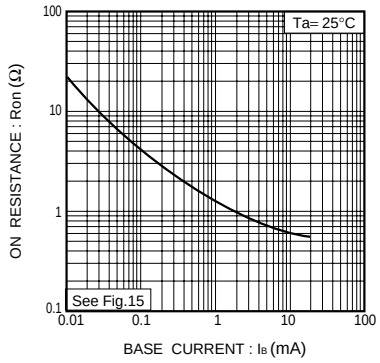



Fig.13 Output-on resistance vs. base current (Ⅰ)

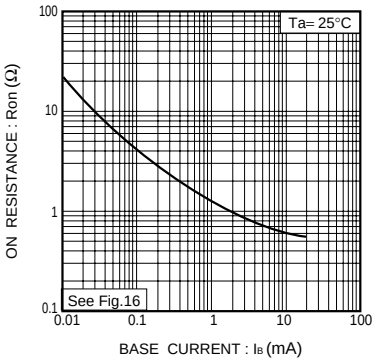



Fig.14 Output-on resistance vs. base current (Ⅱ)

**●Ron measurement circuit**

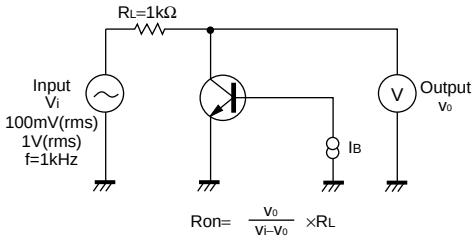



Fig.15 Ron measurement circuit (Ⅰ)

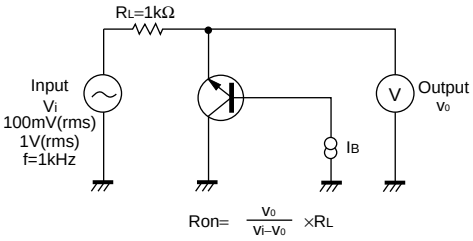



Fig.16 Ron measurement circuit (Ⅱ)

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