



**CHENMKO ENTERPRISE CO.,LTD**

*Lead free devices*

**SURFACE MOUNT  
NPN Switching Transistor**

VOLTAGE 32 Volts CURRENT 1 Ampere

**2SD1664PT**

**APPLICATION**

- \* Telephone and professional communication equipment.
- \* Other switching applications.

**FEATURE**

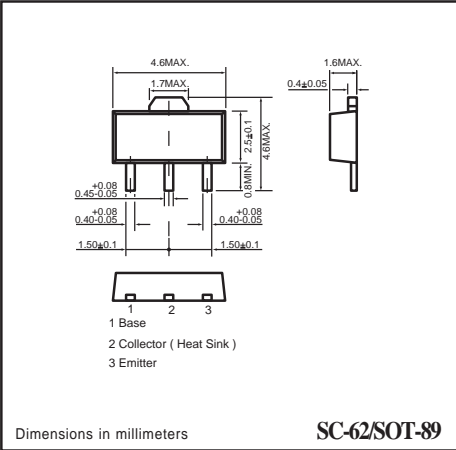
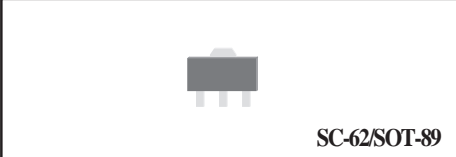
- \* Suitable for high packing density.
- \* Low voltage (Max.=32V) .
- \* High saturation current capability.
- \* Voltage controlled small signal switch.

**CONSTRUCTION**

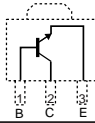
- \* NPN Switching Transistor

**MARKING**

- \* HFE(R):DAP
- \* HFE(P):P64
- \* HFE(Q):Q64



**CIRCUIT**



**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL    | PARAMETER                 | CONDITIONS                                       | MIN. | MAX. | UNIT             |
|-----------|---------------------------|--|------|------|------------------|
| $V_{CB0}$ | collector-base voltage    | open emitter                                     | —    | 40   | V                |
| $V_{CEO}$ | collector-emitter voltage | open base  | —    | 32   | V                |
| $V_{EBO}$ | emitter-base voltage      | open collector                                   | —    | 5    | V                |
| $I_C$     | collector current DC      |  | —    | 1    | A                |
| $P_{tot}$ | total power dissipation   | $T_{amb} \leq 25\text{ }^\circ\text{C}$ ; note 1 | —    | 2000 | mW               |
| $T_{stg}$ | storage temperature       |  | -55  | +150 | $^\circ\text{C}$ |
| $T_j$     | junction temperature      |  | —    | 150  | $^\circ\text{C}$ |

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

## RATING CHARACTERISTIC CURVES ( 2SD1664PT )

### CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| SYMBOL      | PARAMETER                            | CONDITIONS   | MIN. | MAX.     | UNIT |
|-------------|--------------------------------------|--|------|----------|------|
| $BV_{CBO}$  | collector-base breakdown voltage     | $I_E = 0; I_C = 50\text{ }\mu\text{A}$                         | 40   | –        | V    |
| $BV_{CEO}$  | collector-emitter breakdown voltage  | $I_B = 0; I_C = 1\text{ mA}$                                   | 32   | –        | V    |
| $BV_{EBO}$  | emitter-base breakdown voltage       | $I_C = 0; I_E = 50\text{ }\mu\text{A}$                         | 5    | –        | V    |
| $I_{CBO}$   | collector cut-off current            | $I_E = 0; V_{CB} = 20\text{ V}$                                | –    | 500      | nA   |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = 4\text{ V}$                                 | –    | 500      | nA   |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 3\text{ V}$ ; note 1<br>$I_C = 100\text{ mA}$        | 82   | 390      |      |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 500\text{ mA}, I_B = 50\text{ mA}$                      | –    | 400      | mV   |
| $C_C$       | collector capacitance                | $I_E = I_B = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$        | –    | 15 Typ.  | pF   |
| $f_T$       | transition frequency                 | $I_C = -50\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | –    | 150 Typ. | MHz  |

### Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .
2.  $h_{FE}$ : R Grade: 82~180  
P Grade: 120~270  
Q Grade: 180~390

## RATING CHARACTERISTIC CURVES ( 2SD1664PT )

### Typical Electrical Characteristics

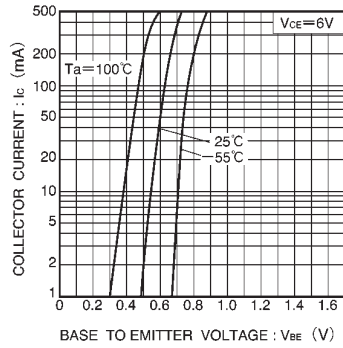


Fig.1 Grounded emitter propagation characteristics

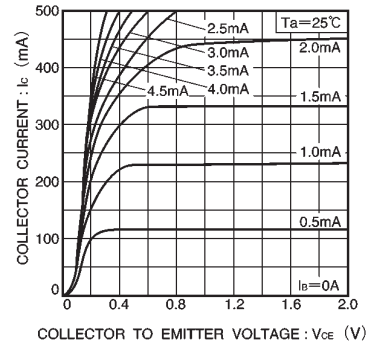


Fig.2 Grounded emitter output characteristics

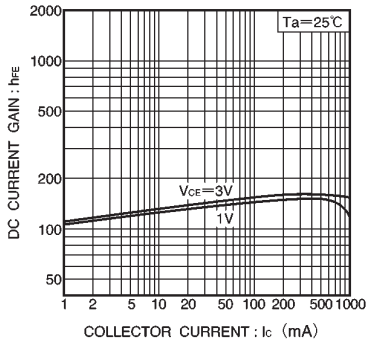


Fig.3 DC current gain vs. collector current ( I )

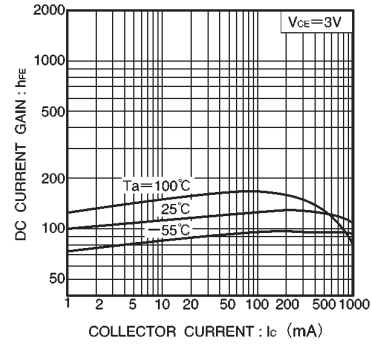


Fig.4 DC current gain vs. collector current ( II )

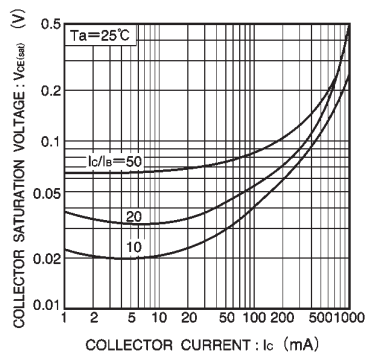


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

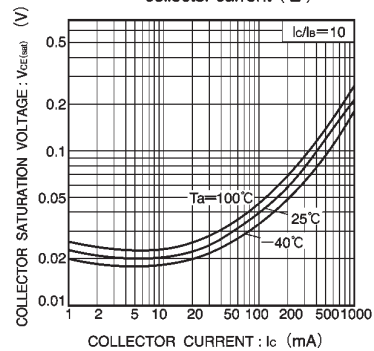


Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

## RATING CHARACTERISTIC CURVES ( 2SD1664PT )

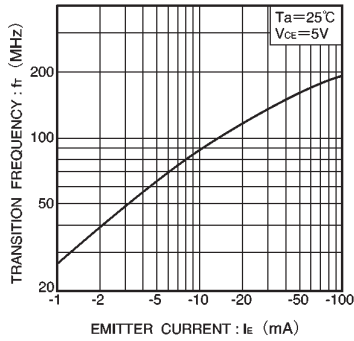


Fig.7 Gain bandwidth product vs. emitter current

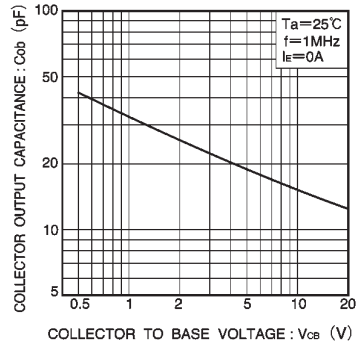


Fig.8 Collector output capacitance vs. collector-base voltage

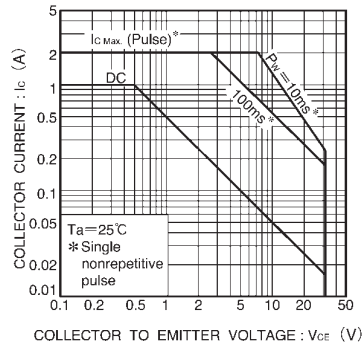


Fig.9 Safe operating area (2SD1664)

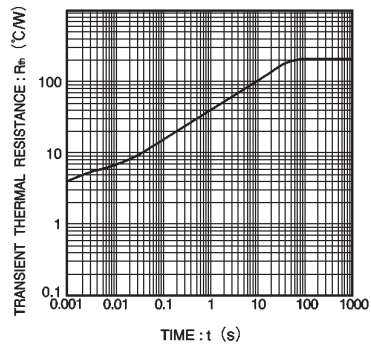


Fig.10 Transient thermal resistance (2SD1664)

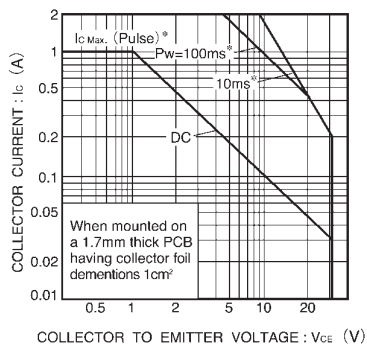


Fig.11 Safe operating area

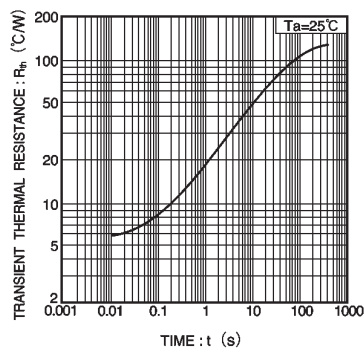


Fig.12 Transient thermal resistance