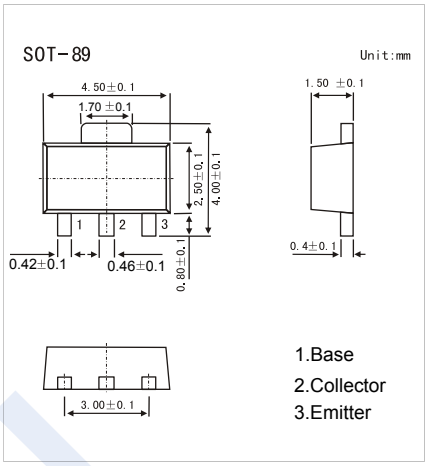
# NPN Transistors

# 2SD1000




## ■ Features

- Low collector saturation voltage.

  $V_{CE(sat)}$ < 0.4V ($I_C$=500mA,$I_B$=50mA)

- Complimentary to 2SB799

## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Collector - Base Voltage | $V_{CBO}$ | 60 | V |
| Collector - Emitter Voltage | $V_{CEO}$ | 50 | |
| Emitter - Base Voltage | $V_{EBO}$ | 5 | |
| Collector Current - Continuous | $I_C$ | 700 | mA |
| Collector Current - Pulse (Note.1) | $I_{CP}$ | 1 | A |
| Collector Power Dissipation | $P_C$ | 2 | W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature Range | $T_{stg}$ | -55 to 150 | |

Note.1: Pw ⩽ 100ms,duty cycle ⩽ 50%

## ■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector- base breakdown voltage | $V_{CBO}$ | $I_C$= 100 μA, $I_E$= 0 | 60 | | | V |
| Collector- emitter breakdown voltage | $V_{CEO}$ | $I_C$= 1 mA, $R_{BE}$= ∞ | 50 | | | |
| Emitter - base breakdown voltage | $V_{EBO}$ | $I_E$= 100 μ A, $I_C$= 0 | 5 | | | |
| Collector-base cut-off current | $I_{CBO}$ | $V_{CB}$= 60 V , $I_E$= 0 | | | 0.1 | uA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$= 5V , $I_C$=0 | | | 0.1 | |
| Collector-emitter saturation voltage (Note.1) | $V_{CE(sat)}$ | $I_C$=500 mA, $I_B$=50mA | | 0.12 | 0.4 | V |
| Base - emitter saturation voltage (Note.1) | $V_{BE(sat)}$ | $I_C$=500 mA, $I_B$=50mA | | 0.9 | 1.2 | |
| Base - emitter voltage (Note.1) | $V_{BE}$ | $V_{CE}$= 6V, $I_C$= 10mA | 600 | 635 | 700 | mV |
| DC current gain (Note.1) | $h_{FE}$ | $V_{CE}$= 1V, $I_C$= 100mA | 90 | 200 | 400 | |
| | | $V_{CE}$= 1V, $I_C$= 500mA | 50 | 150 | | |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$= 6V, $I_E$=0,f=1MHz | | 13 | | pF |
| Transition frequency | $f_T$ | $V_{CE}$= 6V, $I_E$= -10mA | | 110 | | MHz |

Note.1: Pulse test : Pulse width ⩽350μs,Duty Cycle⩽2%.

## ■ Classification of $h_{fe(1)}$

| Type | 2SD1000- M | 2SD1000- L | 2SD1000- K |
|---|---|---|---|
| Range | 90-180 | 135-270 | 200-400 |
| Marking | LM | LL | LK |

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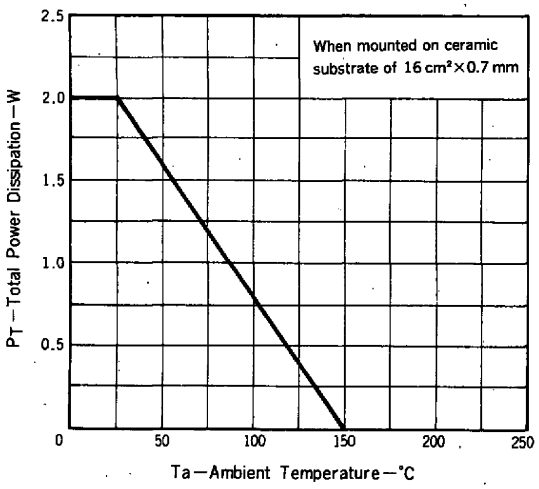
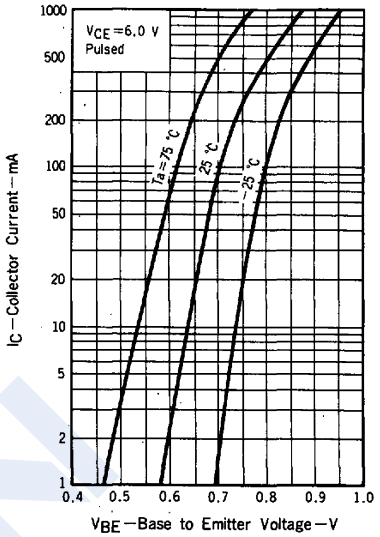
■ Typical Characterisitics

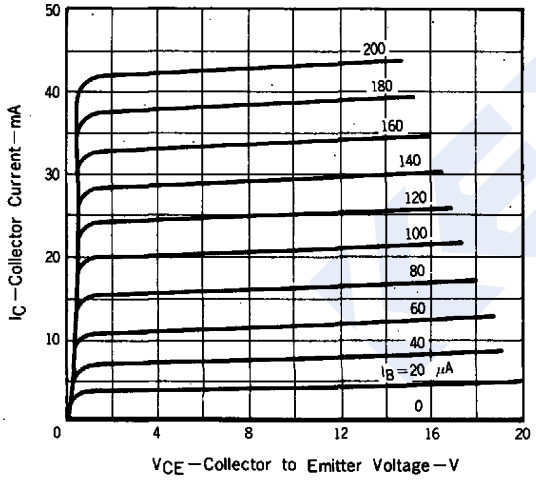
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



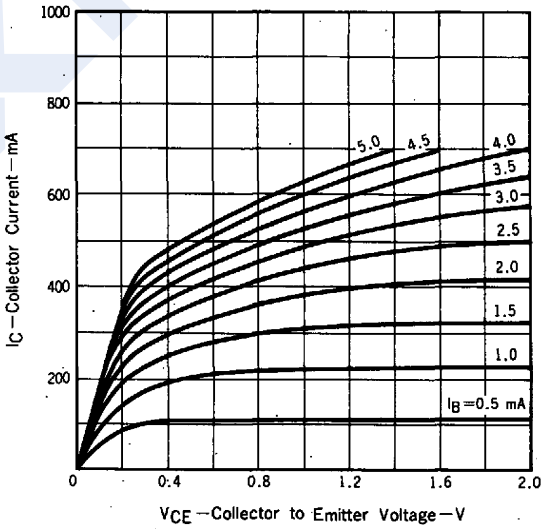

COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



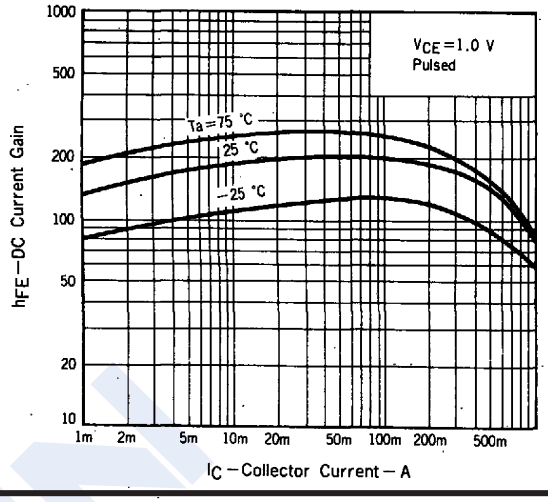

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



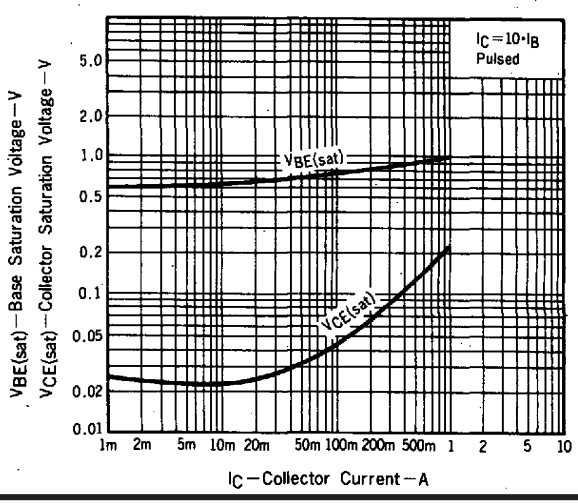

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE




DC CURRENT GAIN vs. COLLECTOR CURRENT




BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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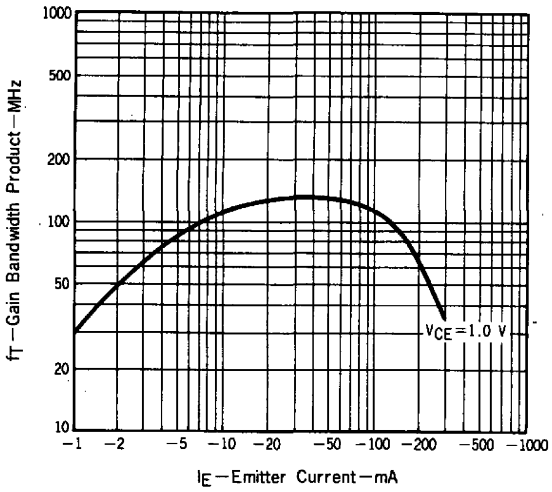
■ Typical Characterisitics

GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT




OUTPUT CAPACITANCE vs. REVERSE VOLTAGE