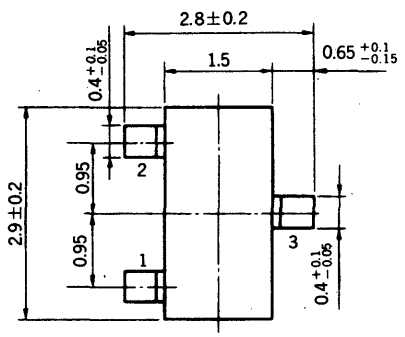
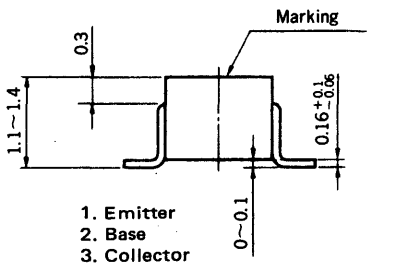
NEC
ELECTRON DEVICE

# SILICON TRANSISTOR
# 2SA1462

## HIGH SPEED SWITCHING
## PNP SILICON EPITAXIAL TRANSISTOR
## MINI MOLD

**PACKAGE DIMENSIONS**
in millimeters




1. Emitter
2. Base
3. Collector

### FEATURES

- High Speed Switching : $t_{on}$ = 9.0 ns TYP.
  $t_{off}$ = 19.0 ns TYP.
- High $f_T$ : $f_T$ = 1 800 MHz TYP.
- Low $C_{ob}$ : $C_{ob}$ = 2.0 pF TYP.
- Complementary to 2SC3735

### ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|---|---|---|
| Maximum Voltages and Current ($T_a$ = 25 °C) | | | |
| Collector to Base Voltage | $V_{CBO}$ | −15 | V |
| Collector to Emitter Voltage | $V_{CEO}$ | −15 | V |
| Emitter to Base Voltage | $V_{EBO}$ | −4.5 | V |
| Collector Current (DC) | $I_C$ | −50 | mA |
| Maximum Power Dissipation | | | |
| Total power Dissipation at 25 °C Ambient Temperature | $P_T$ | 200 | mW |
| Maximum Temperatures | | | |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature Range | $T_{stg}$ | −55 to +150 | °C |

### ELECTRICAL CHARACTERISTICS ($T_a$ = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CBO}$ | | | −100 | nA | $V_{CB}$ = −8.0 V, $I_E$ = 0 |
| Emitter Cutoff Current | $I_{EBO}$ | | | −100 | nA | $V_{EB}$ = −3.0 V, $I_C$ = 0 |
| DC Current Gain | $h_{FE1}$ * | 30 | 70 | | | $V_{CE}$ = −1.0 V, $I_C$ = −1.0 mA |
| DC Current Gain | $h_{FE2}$ * | 50 | 80 | 150 | | $V_{CE}$ = −1.0 V, $I_C$ = −10 mA |
| Collector Saturation Voltage | $V_{CE(sat)}$ * | | −0.09 | −0.20 | V | $I_C$ = −10 mA, $I_B$ = −1.0 mA |
| Base Saturation Voltage | $V_{BE(sat)}$ * | | −0.80 | −0.95 | V | $I_C$ = −10 mA, $I_B$ = −1.0 mA |
| Gain Bandwidth Product | $f_T$ | 800 | 1800 | | MHz | $V_{CE}$ = −10 V, $I_E$ = 10 mA |
| Output Capacitance | $C_{ob}$ | | 2.0 | 3.0 | pF | $V_{CB}$ = −5.0 V, $I_E$ = 0, f = 1.0 MHz |
| Turn-on Time | $t_{on}$ | | 9.0 | 20 | ns | $I_C$ = −10 mA<br>$I_{B1}$ = −$I_{B2}$ = −1.0 mA |
| Storage Time | $t_{stg}$ | | 16 | 40 | ns | |
| Turn-off Time | $t_{off}$ | | 19 | 40 | ns | |

* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

$h_{FE2}$ Classification

| Making | Y33 | Y34 |
|---|---|---|
| $h_{FE2}$ | 50 to 100 | 75 to 150 |



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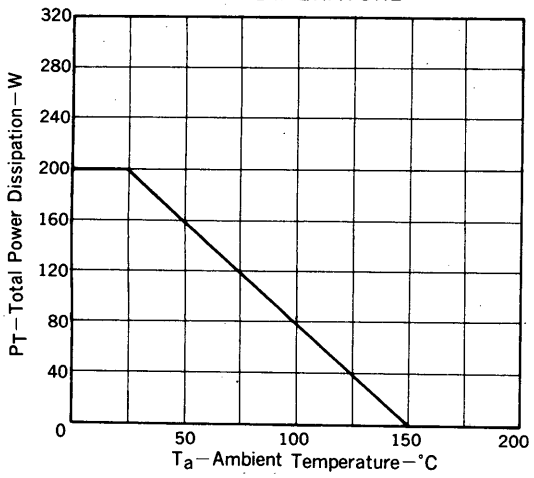
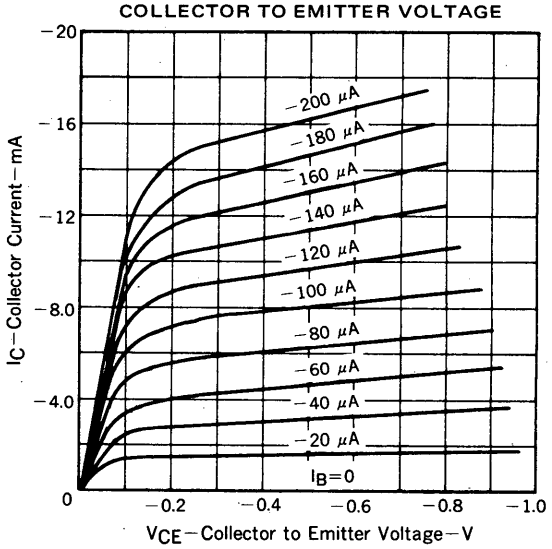
## TYPICAL CHARACTERISTICS ($T_a$ = 25 °C)

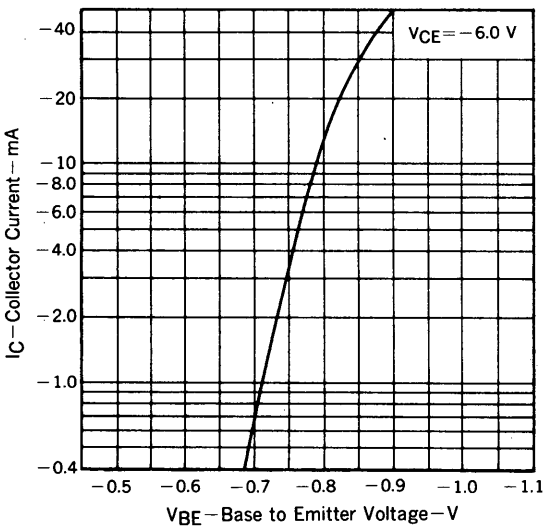
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



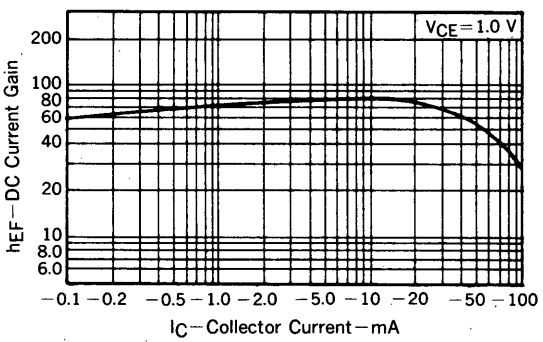

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



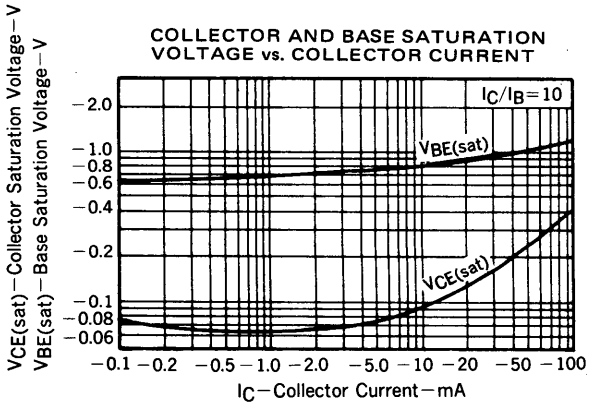

COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



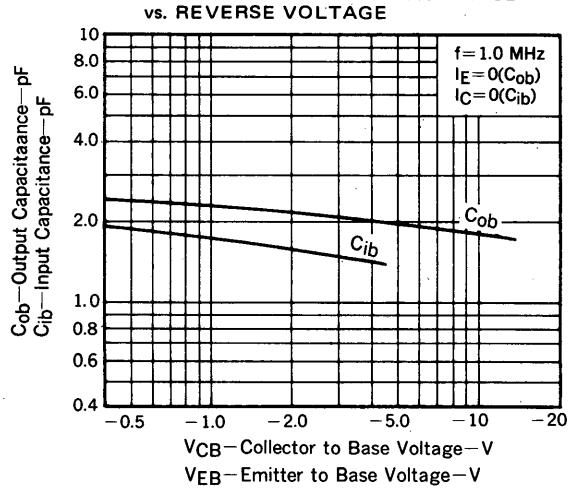

DC CURRENT GAIN vs. COLLECTOR CURRENT



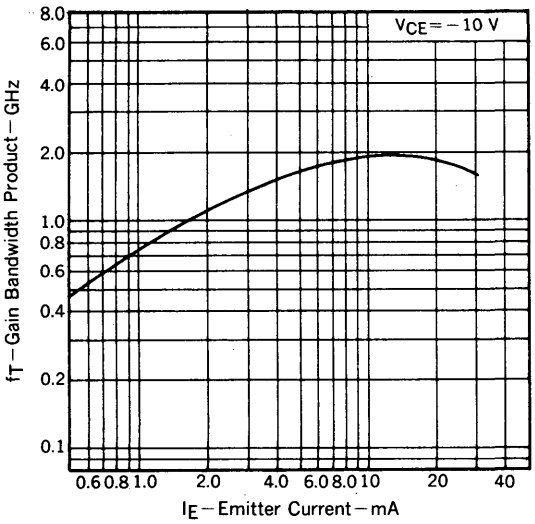

COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



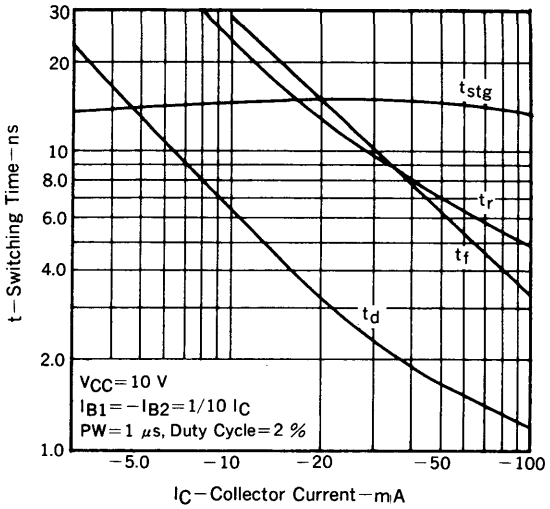

INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



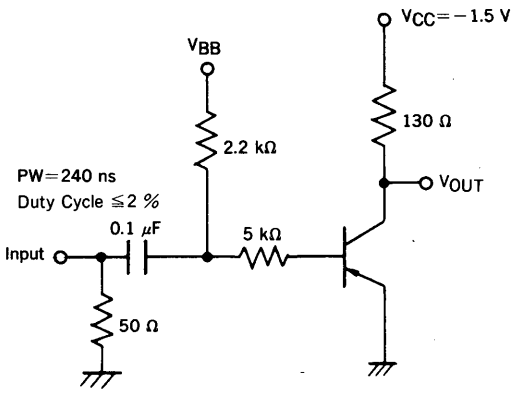
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



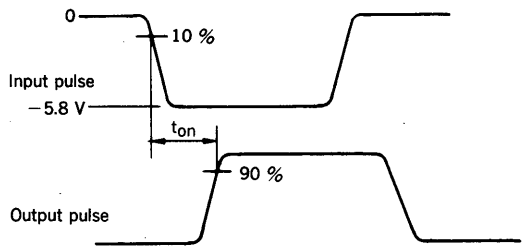

SWITCHING TIME vs. COLLECTOR CURRENT



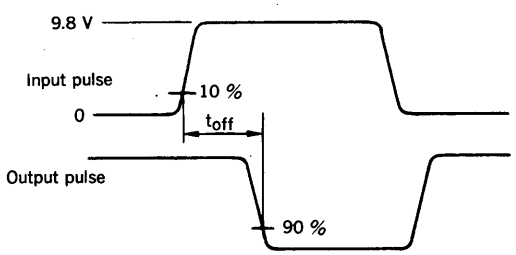

## SWITCHING TIME TEST CIRCUIT



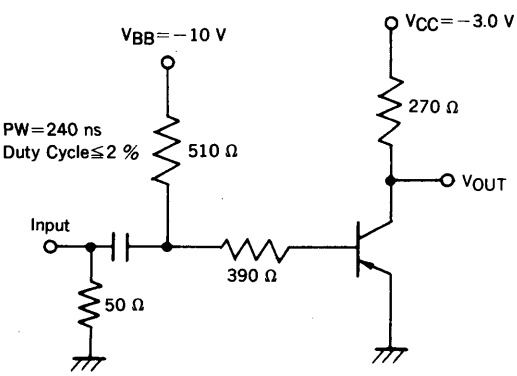

**$t_{on}$, $t_{off}$ Switching**



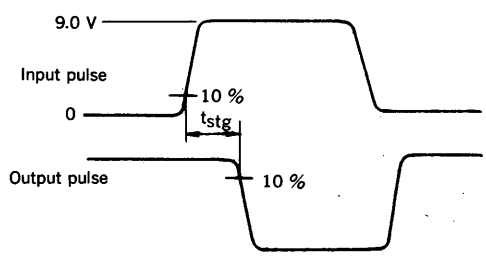

**$t_{on}$ Voltage Waveforms ($V_{BB}$ = GROUND)**




**$t_{off}$ Voltage Waveforms ($V_{BB}$ = −8.0 V)**




**$t_{stg}$ Switching**




**$t_{stg}$ Voltage Waveforms**

## NEC Corporation

**INTERNATIONAL ELECTRON DEVICES DIV.**
SUMITOMO MITA Building, 37-8,
Shiba Gochome, Minato-ku, Tokyo 108, Japan
Tel: Tokyo 456–3111
Telex Address: NECTOK J22686
Cable Address: NEC TOKYO



TC–1638
JULY–10–85M
Printed in Japan