TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

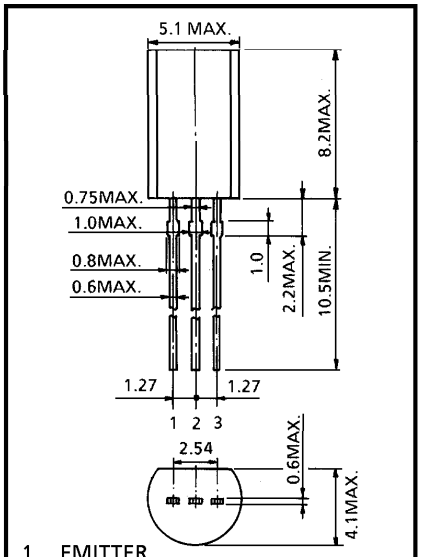
# 2SA1680

POWER AMPLIFIER APPLICATIONS

POWER SWITCHING APPLICATIONS

- Low Collector Saturation Voltage
  : $V_{CE(sat)} = -0.5V$ (Max.) ($I_C = -1A$)
- High Collector Power Dissipation : $P_C = 900mW$ (Ta = 25°C)
- High Speed Switching Time : $t_{stg} = 300ns$ (Typ.)
- Complementary to 2SC4408.

Unit in mm



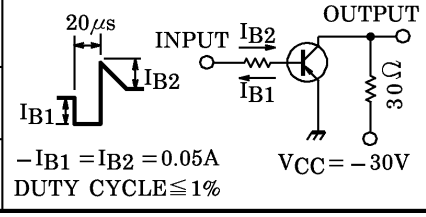

| | |
|---|---|
| JEDEC | TO-92MOD |
| JEITA | — |
| TOSHIBA | 2-5J1A |

Weight : 0.36g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | −60 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | −50 | V |
| Emitter-Base Voltage | $V_{EBO}$ | −6 | V |
| Collector Current | $I_C$ | −2 | A |
| Base Current | $I_B$ | −0.2 | A |
| Collector Power Dissipation | $P_C$ | 900 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature Range | $T_{stg}$ | −55~150 | °C |

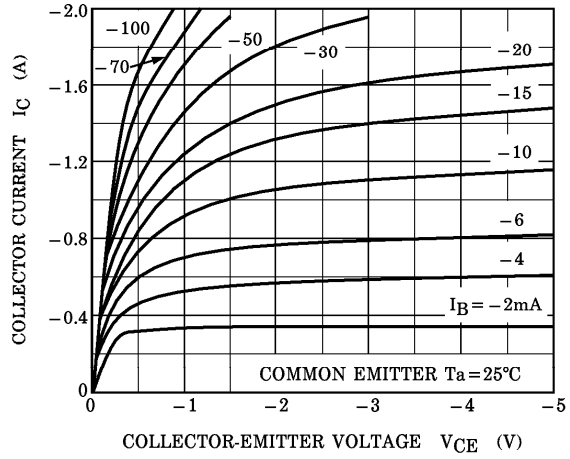
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Collector Cut-off Current | | $I_{CBO}$ | $V_{CB} = -60V$, $I_E = 0$ | — | — | −1.0 | μA |
| Emitter Cut-off Current | | $I_{EBO}$ | $V_{EB} = -6V$, $I_C = 0$ | — | — | −1.0 | μA |
| Collector-Emitter Breakdown Voltage | | $V_{(BR)CEO}$ | $I_C = -10mA$, $I_B = 0$ | −50 | — | — | V |
| DC Current Gain | | $h_{FE(1)}$ | $V_{CE} = -2V$, $I_C = -100mA$ | 120 | — | 400 | |
| | | $h_{FE(2)}$ | $V_{CE} = -2V$, $I_C = -1.5A$ | 40 | — | — | |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | $I_C = -1A$, $I_B = -0.05A$ | — | — | −0.5 | V |
| Base-Emitter Saturation Voltage | | $V_{BE(sat)}$ | $I_C = -1A$, $I_B = -0.05A$ | — | — | −1.2 | V |
| Transition Frequency | | $f_T$ | $V_{CE} = -2V$, $I_C = -100mA$ | — | 100 | — | MHz |
| Collector Output Capacitance | | $C_{ob}$ | $V_{CB} = -10V$, $I_E = 0$, f = 1MHz | — | 23 | — | pF |
| Switching Time | Turn-on Time | $t_{on}$ |  | — | 0.1 | — | μs |
| | Storage Time | $t_{stg}$ | | — | 0.3 | — | |
| | Fall Time | $t_f$ | | — | 0.1 | — | |

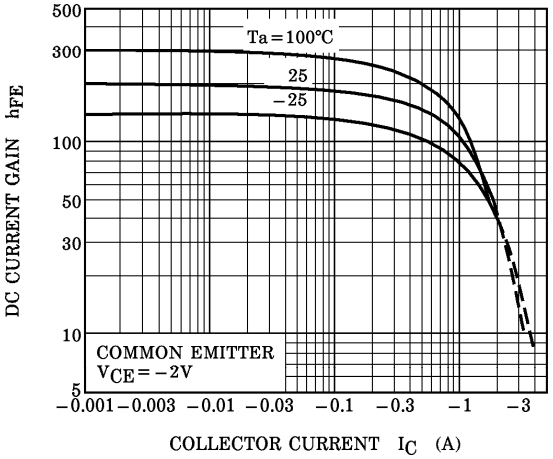


$-I_{B1} = I_{B2} = 0.05A$
DUTY CYCLE ≤ 1%

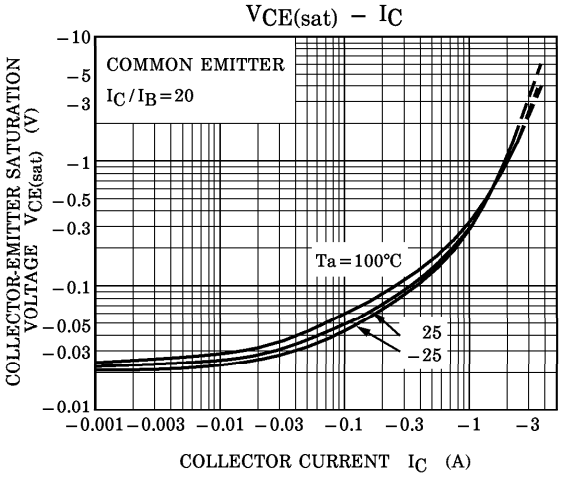
$I_C - V_{CE}$



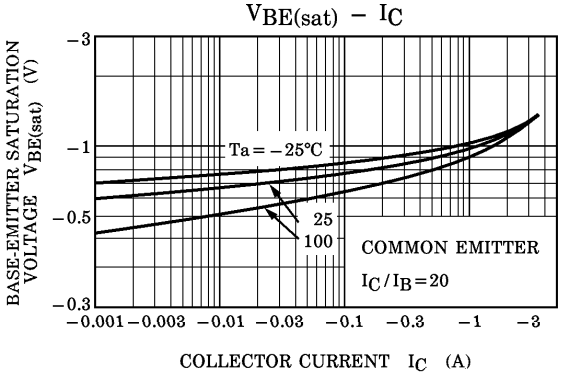

$h_{FE} - I_C$



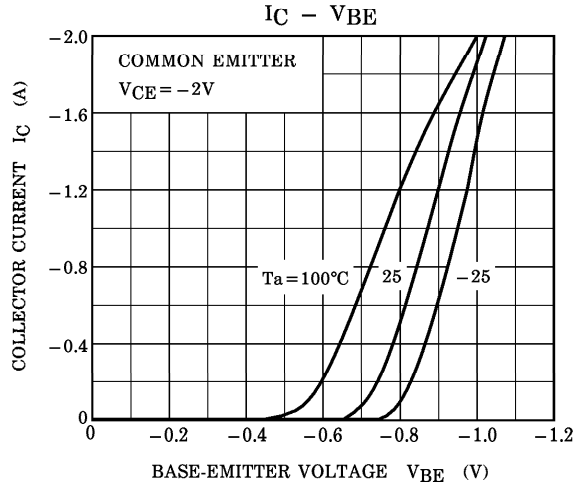

$V_{CE(sat)} - I_C$



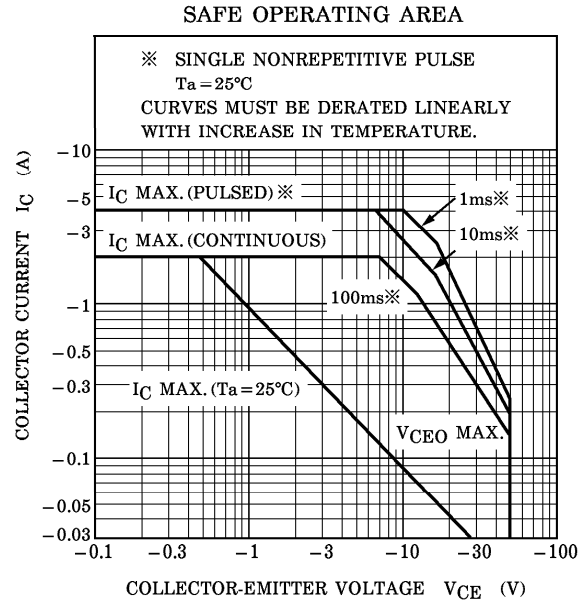

$V_{BE(sat)} - I_C$




$I_C - V_{BE}$




SAFE OPERATING AREA



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