

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

2SC4408

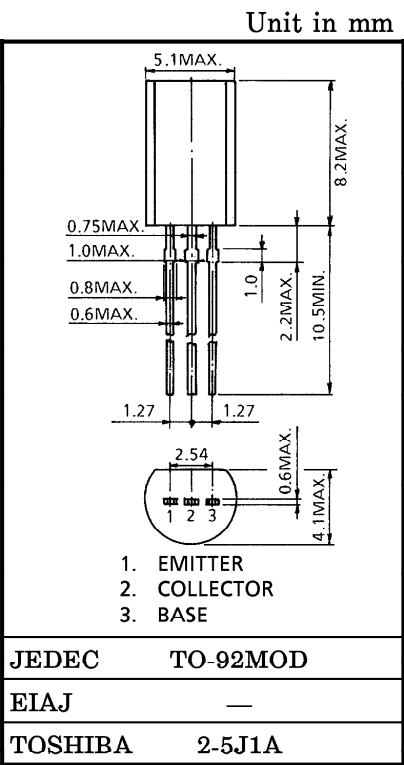
POWER AMPLIFIER APPLICATIONS

POWER SWITCHING APPLICATIONS

- Low Collector Saturation Voltage :  $V_{CE(sat)}=0.5V$  (Max.)
- High Collector Power Dissipation :  $P_C=900mW$  ( $T_a=25^{\circ}C$ )
- High Speed Switching Time :  $t_{stg}=500ns$  (Typ.)
- Complementary to 2SA1680

MAXIMUM RATINGS ( $T_a=25^{\circ}C$ )

| CHARACTERISTIC              | SYMBOL    | RATING       | UNIT        |
|-----------------------------|-----------|--------------|-------------|
| Collector-Base Voltage      | $V_{CBO}$ | 80           | 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          | $^{\circ}C$ |
| Storage Temperature Range   | $T_{stg}$ | $-55\sim150$ | $^{\circ}C$ |



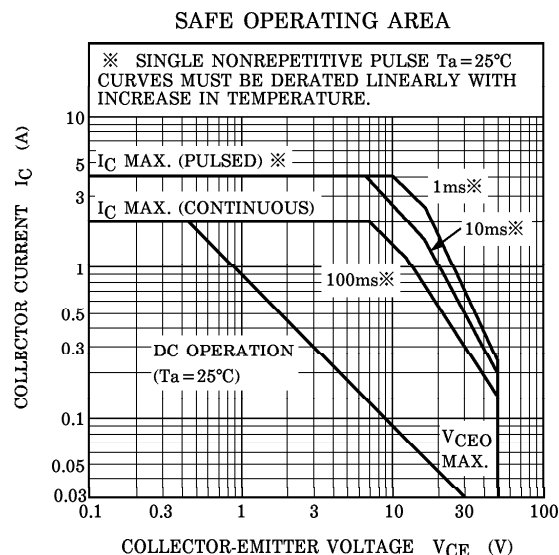
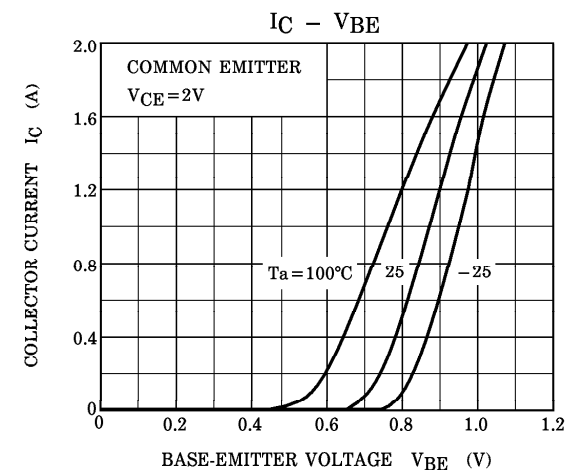
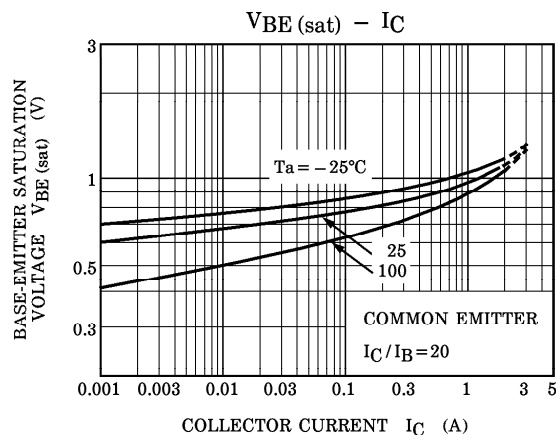
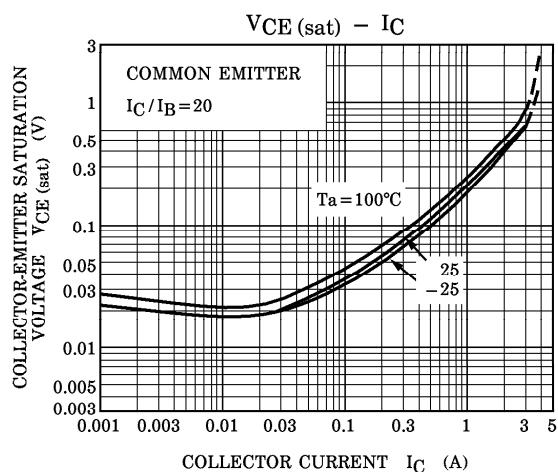
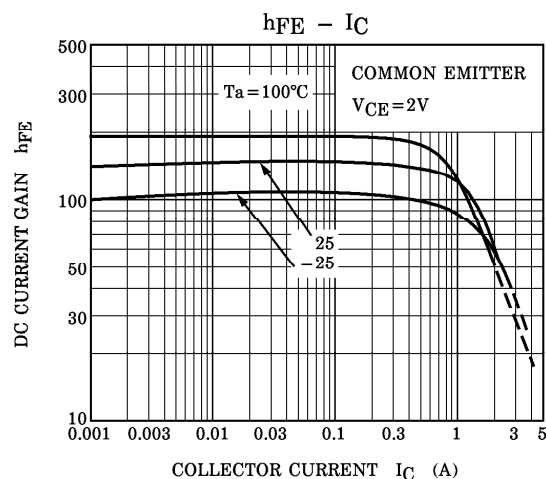
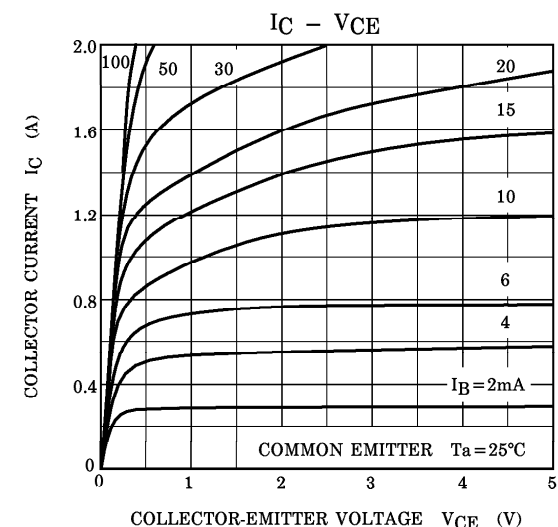
ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}C$ )

Weight : 0.36g (Typ.)

| CHARACTERISTIC                       |              | SYMBOL        | TEST CONDITION                                                                                                                                                                                    | MIN.                                                 | TYP. | MAX. | UNIT    |
|--------------------------------------|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------|------|---------|
| Collector Cut-off Current            |              | $I_{CBO}$     | $V_{CB}=80V, I_E=0$                                                                                                                                                                               | —                                                    | —    | 1.0  | $\mu A$ |
| Emitter Cut-off Current              |              | $I_{EBO}$     | $V_{EB}=6V, I_C=0$                                                                                                                                                                                | —                                                    | —    | 1.0  | $\mu A$ |
| 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         |              | $C_{ob}$      | $V_{CB}=10V, I_E=0, f=1MHz$                                                                                                                                                                       | —                                                    | 14   | —    | pF      |
| Switching Time                       | Turn-on Time | $t_{on}$      | <p><math>20\mu s</math><br/><math>I_{B1}</math> INPUT <math>I_{B2}</math><br/>OUTPUT <math>I_{B1}</math> <math>I_{B2}</math><br/><math>V_{CC}=30V</math><br/>DUTY CYCLE <math>\leq 1\%</math></p> | —                                                    | 0.1  | —    | $\mu s$ |
|                                      | Storage Time | $t_{stg}$     |                                                                                                                                                                                                   | —                                                    | 0.5  | —    |         |
|                                      | Fall Time    | $t_f$         |                                                                                                                                                                                                   | $I_{B1} = -I_{B2} = 0.05A,$<br>DUTY CYCLE $\leq 1\%$ | —    | 0.1  |         |

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