

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

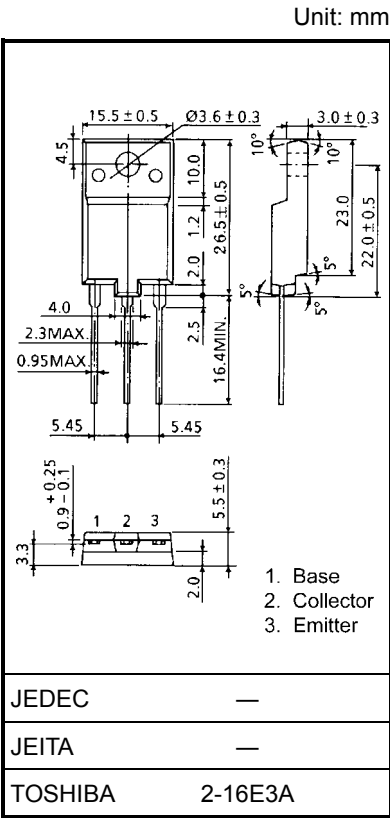
2SD2499

HORIZONTAL DEFLECTION OUTPUT FOR COLOR TV

- High Voltage :  $V_{CBO} = 1500\text{ V}$
- Low Saturation Voltage :  $V_{CE(sat)} = 5\text{ V (Max.)}$
- High Speed :  $t_f = 0.3\text{ }\mu\text{s (Typ.)}$
- Built-in Damper Type
- Collector Metal (Fin) is Fully Covered with Mold Resin.

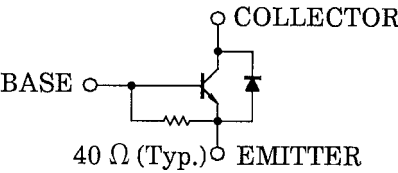
MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ )

| CHARACTERISTIC              |       | SYMBOL    | RATING  | UNIT             |
|-----------------------------|-------|-----------|---------|------------------|
| Collector-Base Voltage      |       | $V_{CBO}$ | 1500    | V                |
| Collector-Emitter Voltage   |       | $V_{CEO}$ | 600     | V                |
| Emitter-Base Voltage        |       | $V_{EBO}$ | 5       | V                |
| Collector Current           | DC    | $I_C$     | 6       | A                |
|                             | Pulse | $I_{CP}$  | 12      |                  |
| Base Current                |       | $I_B$     | 3       | A                |
| Collector Power Dissipation |       | $P_C$     | 50      | W                |
| Junction Temperature        |       | $T_j$     | 150     | $^\circ\text{C}$ |
| Storage Temperature Range   |       | $T_{stg}$ | -55~150 | $^\circ\text{C}$ |



Weight: 5.5 g (typ.)

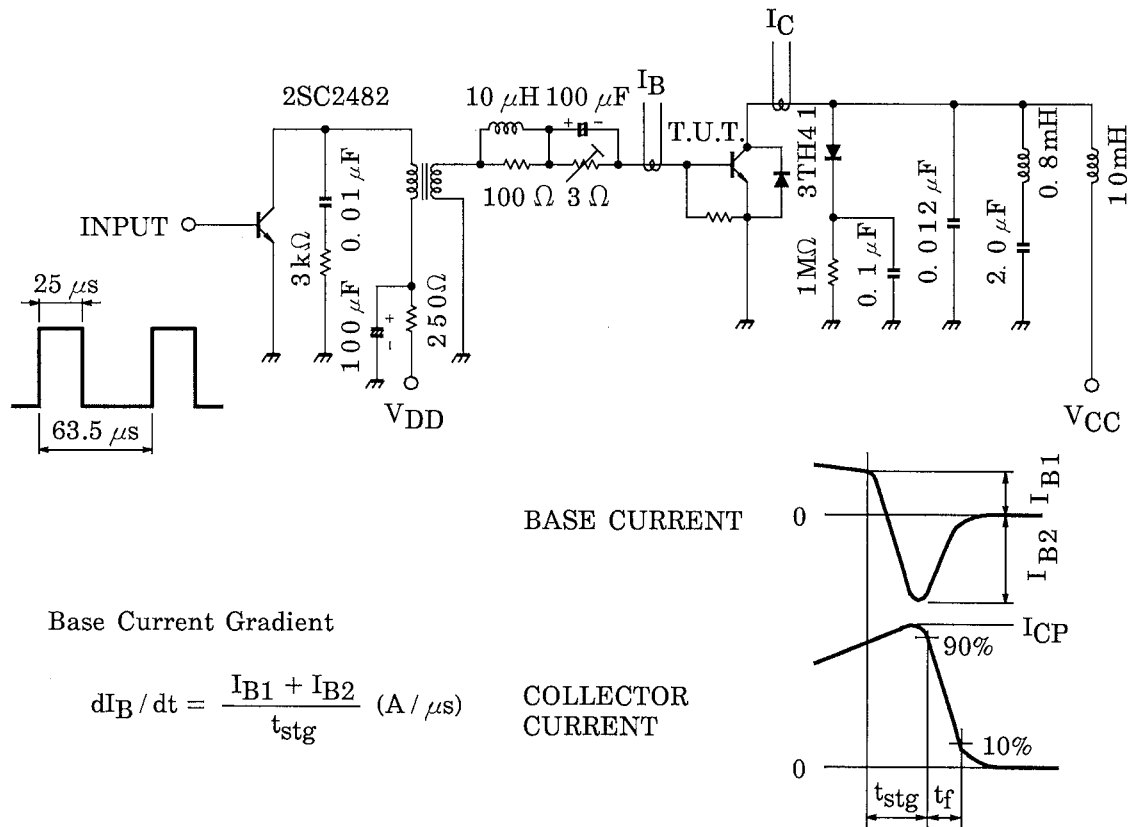
EQUIVALENT CIRCUIT

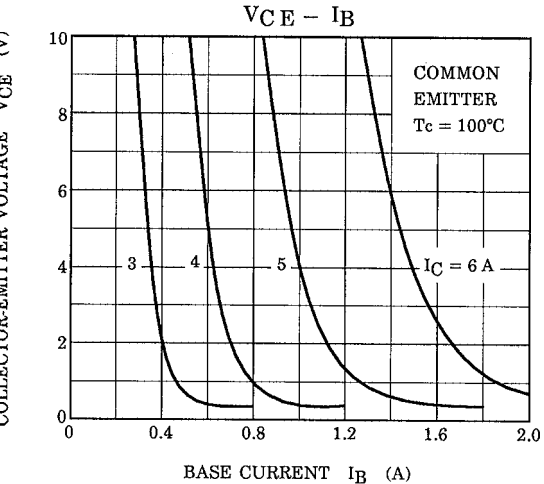
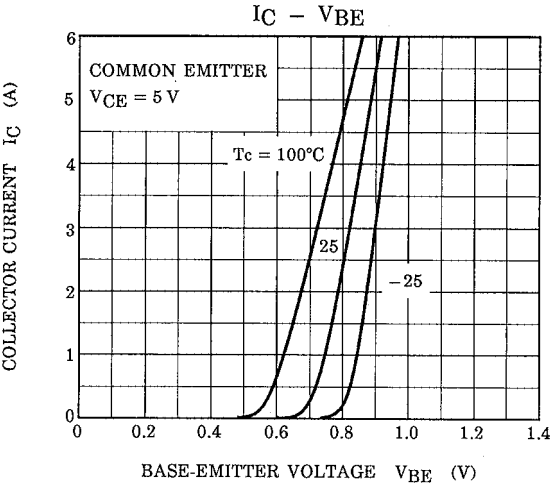
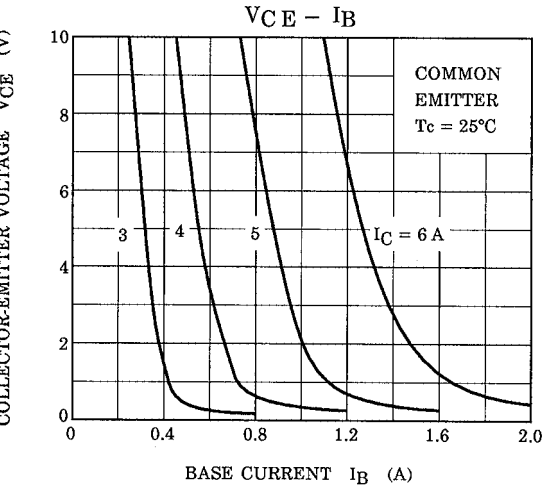
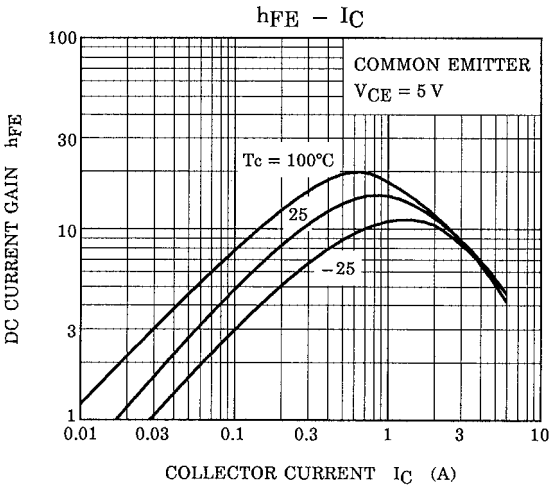
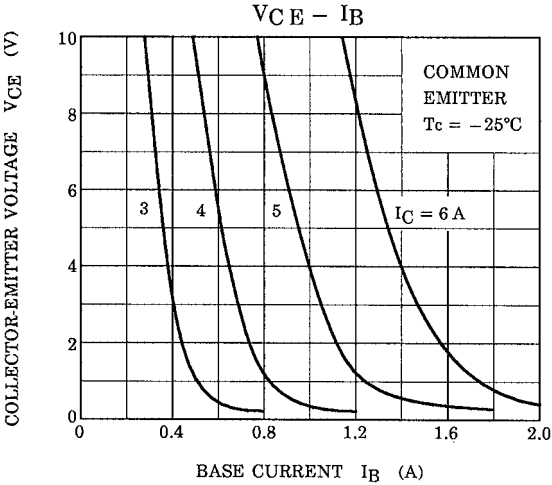
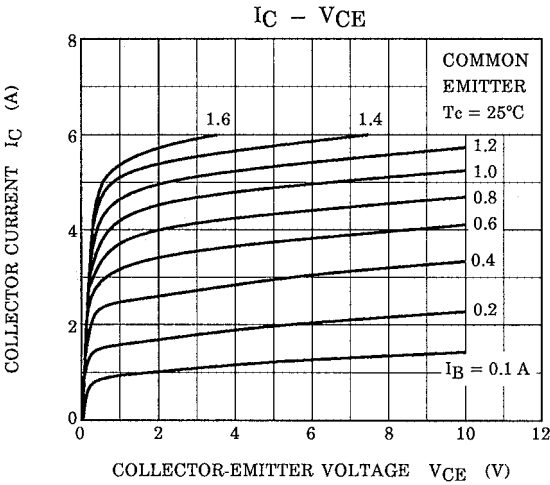


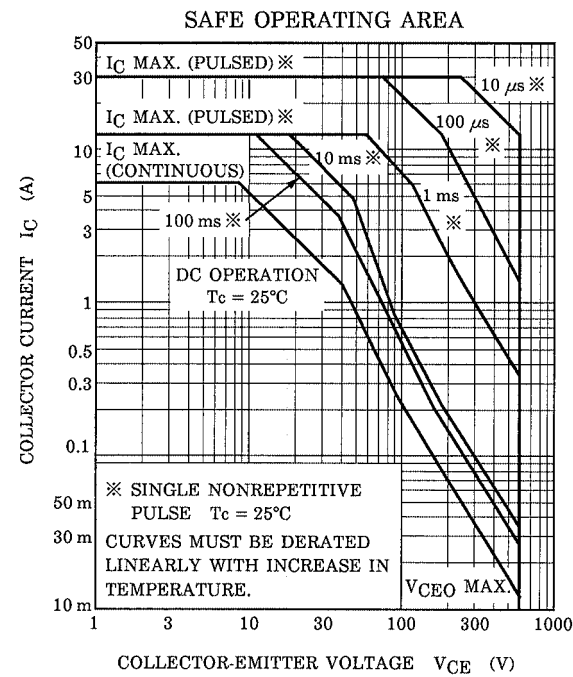
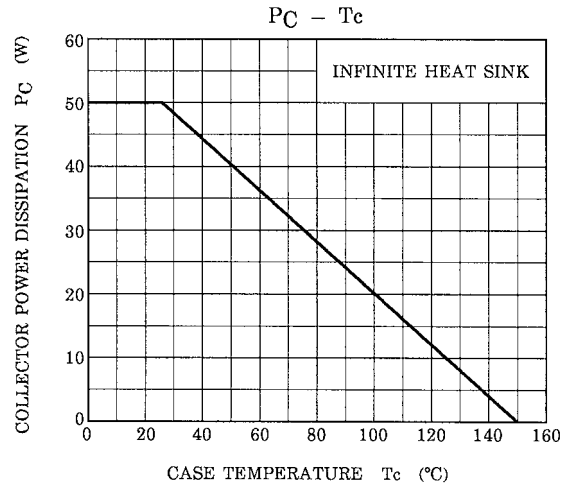
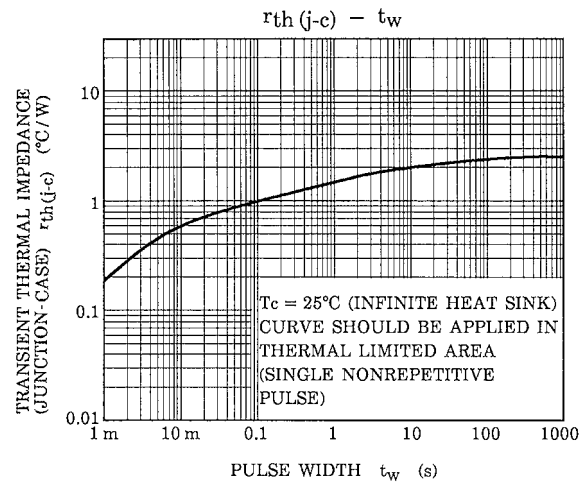
ELECTRICAL CHARACTERISTICS (Tc = 25°C)

| CHARACTERISTIC                       |                     | SYMBOL                | TEST CONDITION                                                                     | MIN | TYP. | MAX | UNIT |
|--------------------------------------|---------------------|-----------------------|------------------------------------------------------------------------------------|-----|------|-----|------|
| Collector Cut-off Current            |                     | ICBO                  | V <sub>CB</sub> = 1500 V, I <sub>E</sub> = 0                                       | —   | —    | 1   | mA   |
| Emitter Cut-off Current              |                     | IEBO                  | V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0                                          | 67  | —    | 200 | mA   |
| Emitter-Base Breakdown Voltage       |                     | V (BR) EBO            | I <sub>C</sub> = 400 mA, I <sub>B</sub> = 0                                        | 5   | —    | —   | V    |
| DC Current Gain                      | h <sub>FE</sub> (1) |                       | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 1 A                                        | 8   | —    | 25  | —    |
|                                      | h <sub>FE</sub> (2) |                       | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 4 A                                        | 5   | —    | 9   |      |
| Collector-Emitter Saturation Voltage |                     | V <sub>CE</sub> (sat) | I <sub>C</sub> = 4 A, I <sub>B</sub> = 0.8 A                                       | —   | —    | 5   | V    |
| Base-Emitter Saturation Voltage      |                     | V <sub>BE</sub> (sat) | I <sub>C</sub> = 4 A, I <sub>B</sub> = 0.8 A                                       | —   | 1.05 | 1.3 | V    |
| Forward Voltage (Damper Diode)       |                     | V <sub>F</sub>        | I <sub>F</sub> = 6 A                                                               | —   | 1.6  | 2.0 | V    |
| Transition Frequency                 |                     | f <sub>T</sub>        | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 0.1 A                                     | —   | 2    | —   | MHz  |
| Collector Output Capacitance         |                     | C <sub>ob</sub>       | V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz                              | —   | 95   | —   | pF   |
| Switching Time (Fig.1)               | Storage Time        | t <sub>stg</sub>      | I <sub>CP</sub> = 4 A, I <sub>B1</sub> (end) = 0.8 A<br>f <sub>H</sub> = 15.75 kHz | —   | 7.5  | 11  | μs   |
|                                      | Fall Time           | t <sub>f</sub>        |                                                                                    | —   | 0.3  | 0.6 |      |

Fig.1 SWITCHING TIME TEST CIRCUIT







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