TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

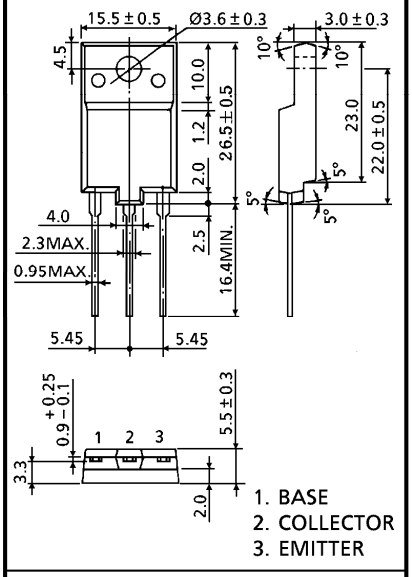
# 2SC5148

HORIZONTAL DEFLECTION OUTPUT FOR HIGH RESOLUTION DISPLAY, COLOR TV

HIGH SPEED SWITCHING APPLICATIONS

- High Speed : $t_f = 0.15\ \mu s$ (Typ.)
- High Voltage : $V_{CBO} = 1500$ V
- Low Saturation Voltage : $V_{CE\ (sat)} = 5$ V (Max.)
- Collector Metal (Fin) is Fully Covered with Mold Resin

Unit in mm




| | |
|---|---|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-16E3A |

Weight : 5.5 g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

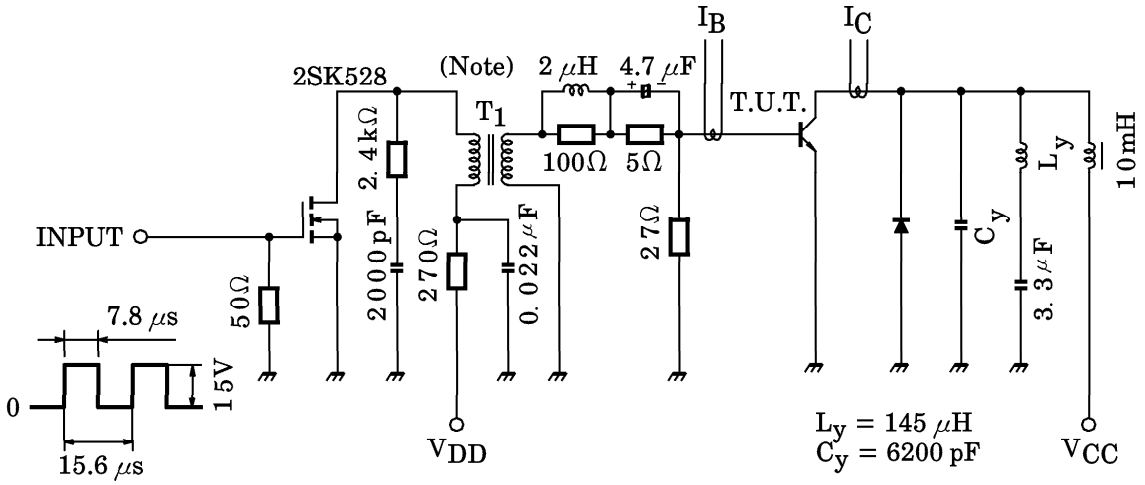
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 1500 | V |
| Collector-Emitter Voltage | | $V_{CEO}$ | 600 | V |
| Emitter-Base Voltage | | $V_{EBO}$ | 5 | V |
| Collector Current | DC | $I_C$ | 8 | A |
| | Pulse | $I_{CP}$ | 16 | |
| Base Current | | $I_B$ | 4 | A |
| Collector Power Dissipation (Tc = 25°C) | | $P_C$ | 50 | W |
| Junction Temperature | | $T_j$ | 150 | °C |
| Storage Temperature Range | | $T_{stg}$ | −55~150 | °C |

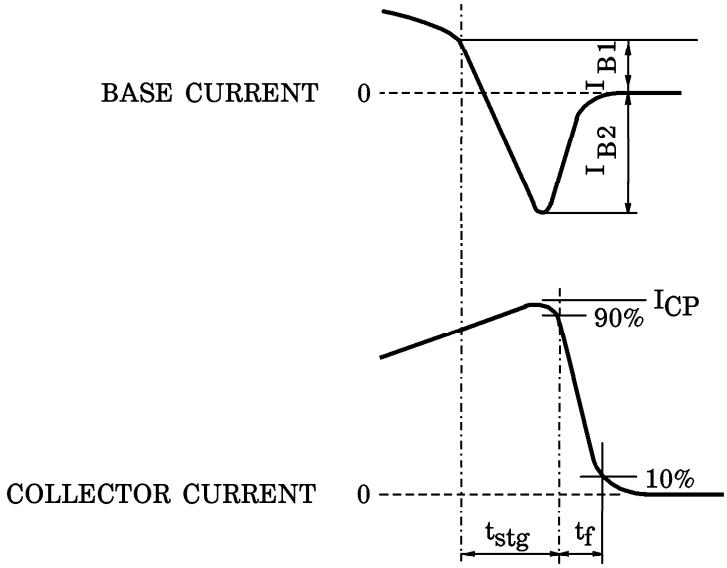
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Collector Cut-off Current | | $I_{CBO}$ | $V_{CB} = 1500$ V, $I_E = 0$ | — | — | 1 | mA |
| Emitter Cut-off Current | | $I_{EBO}$ | $V_{EB} = 5$ V, $I_C = 0$ | — | — | 10 | μA |
| Collector-Emitter Breakdown Voltage | | $V_{(BR)\ CEO}$ | $I_C = 10$ mA, $I_B = 0$ | 600 | — | — | V |
| DC Current Gain | | $h_{FE}$ (1) | $V_{CE} = 5$ V, $I_C = 1$ A | 8 | — | 25 | — |
| | | $h_{FE}$ (2) | $V_{CE} = 5$ V, $I_C = 5$ A | 3.8 | — | 8.0 | |
| Collector-Emitter Saturation Voltage | | $V_{CE\ (sat)}$ | $I_C = 5$ A, $I_B = 1.3$ A | — | — | 5 | V |
| Base-Emitter Saturation Voltage | | $V_{BE\ (sat)}$ | $I_C = 5$ A, $I_B = 1.3$ A | — | 1.0 | 1.3 | V |
| Transition Frequency | | $f_T$ | $V_{CE} = 10$ V, $I_C = 0.1$ A | — | 2 | — | MHz |
| Collector Output Capacitance | | Cob | $V_{CB} = 10$ V, $I_E = 0$, f = 1 MHz | — | 110 | — | pF |
| Switching Time (Fig.1) | Storage Time | $t_{stg}$ | $I_{CP} = 4$ A, $I_{B1}$ (end) = 0.8 A | — | 2.5 | 4 | μs |
| | Fall Time | $t_f$ | $f_H = 64$ kHz | — | 0.15 | 0.3 | |

961001EAA2

Fig.1 SWITCHING TIME TEST CIRCUIT



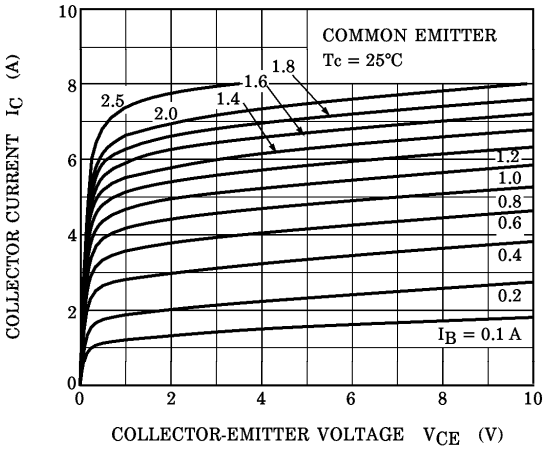




Base Current Gradient

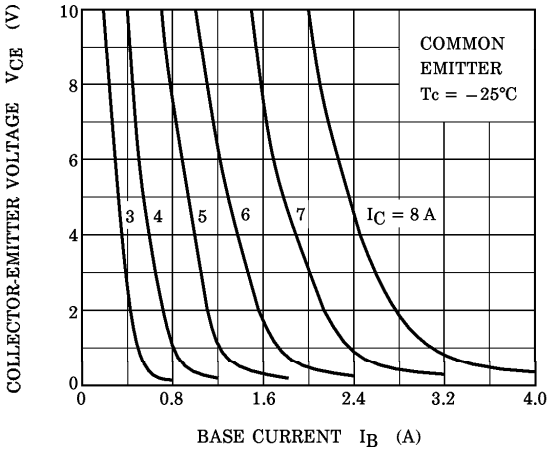
$$dI_B / dt = \frac{I_{B1} + I_{B2}}{t_{stg}} \ (A / \mu s)$$

(Note) : Leakage Inductance of secondary winding LB is 1.2 μH

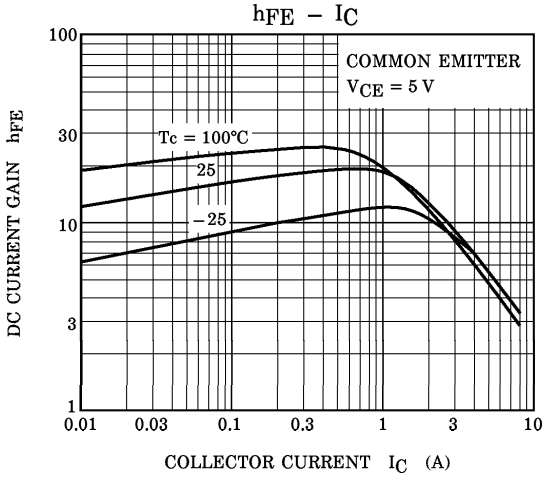
$I_C - V_{CE}$



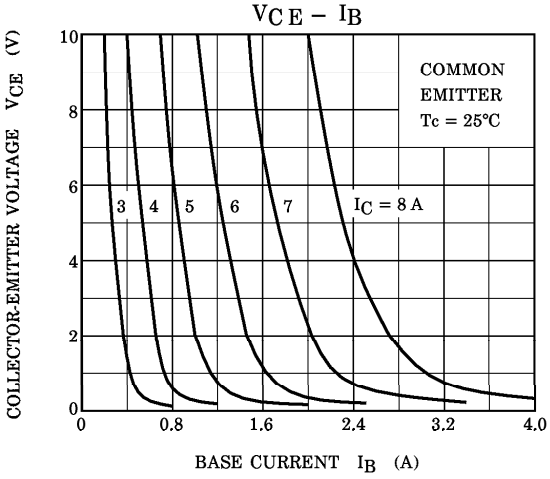

$V_{CE} - I_B$



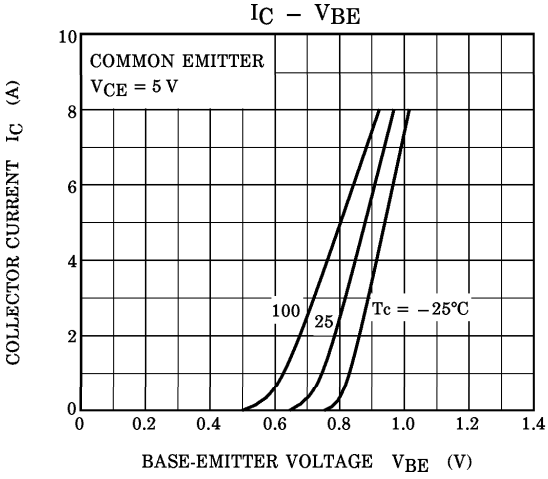

$h_{FE} - I_C$



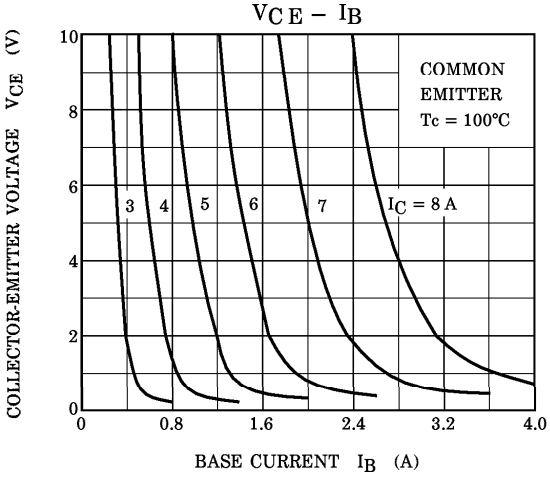

$V_{CE} - I_B$



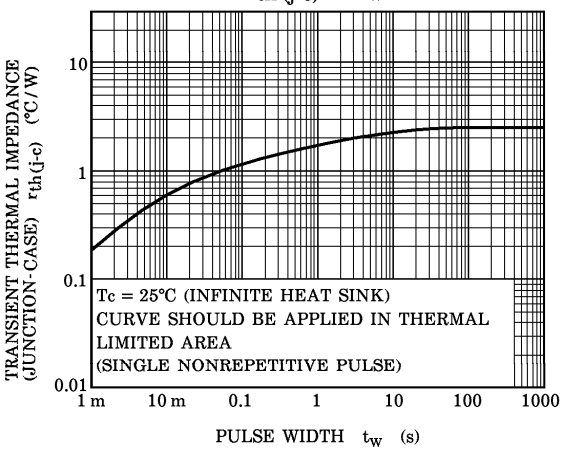

$I_C - V_{BE}$



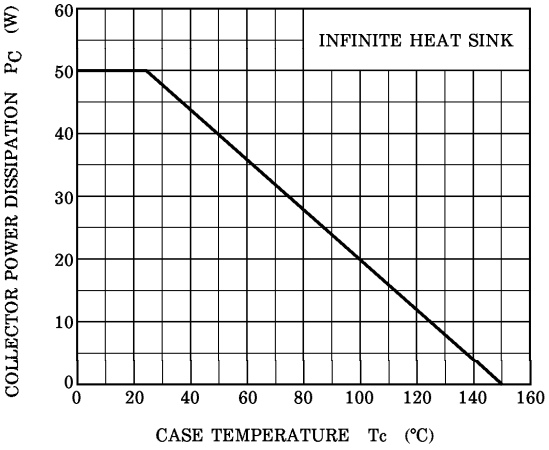

$V_{CE} - I_B$



$r_{th\,(j\text{-}c)}$ – $t_w$




$P_C$ – Tc




SAFE OPERATING AREA