

PNP SILICON EPITAXIAL POWER TRANSISTOR
FOR HIGH-SPEED SWITCHING

The 2SB1453 is a power transistor that can directly drive from the IC output. This transistor is ideal for motor drivers and solenoid drivers in such as OA and FA equipment.

In addition, a small resin-molded insulation type package contributes to high-density mounting and reduction of mounting cost.

FEATURES

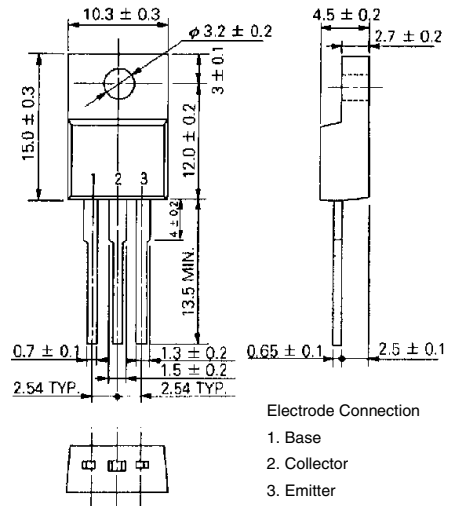
- High DC current amplifier ratio
 $h_{FE} \geq 100$ ($V_{CE} = -5$ V, $I_C = -0.5$ A)
- Mold package that does not require an insulating board or insulation bushing

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

| Parameter | Symbol | Ratings | Unit |
|------------------------------|------------------------------------|-------------|------------------|
| Collector to base voltage | V_{CBO} | -60 | V |
| Collector to emitter voltage | V_{CEO} | -60 | V |
| Emitter to base voltage | V_{EBO} | -7.0 | V |
| Collector current (DC) | $I_{C(DC)}$ | -3.0 | A |
| Collector current (pulse) | $I_{C(pulse)^*}$ | -6.0 | A |
| Base current (DC) | $I_{B(DC)}$ | -1.0 | A |
| Total power dissipation | P_T ($T_C = 25^\circ\text{C}$) | 25 | W |
| Total power dissipation | P_T ($T_a = 25^\circ\text{C}$) | 2.0 | W |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

* $PW \leq 10$ ms, duty cycle $\leq 50\%$

PACKAGE DRAWING (UNIT: mm)



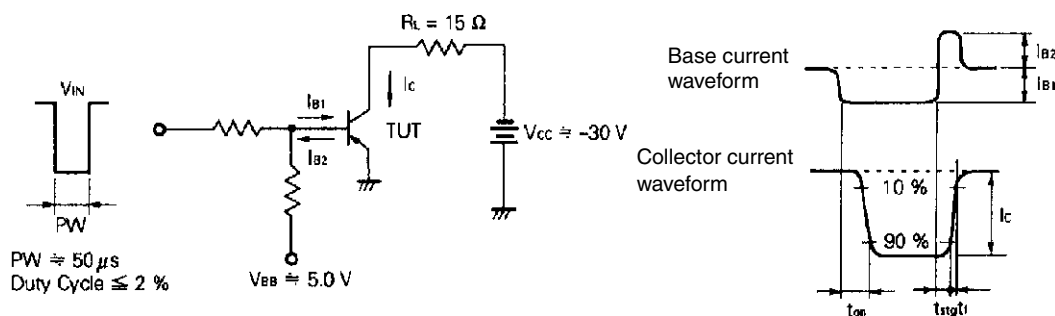
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

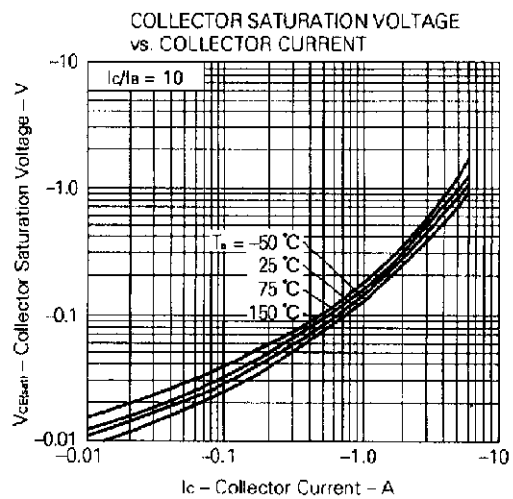
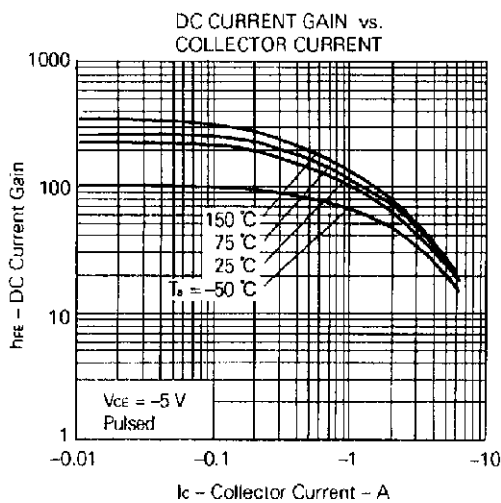
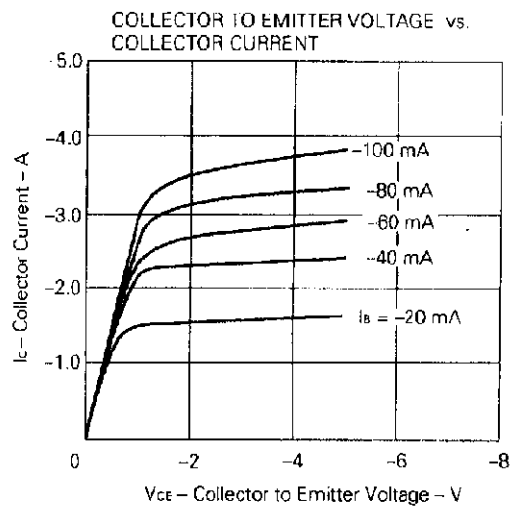
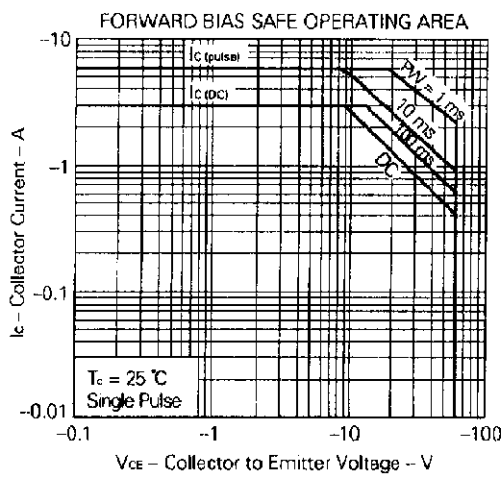
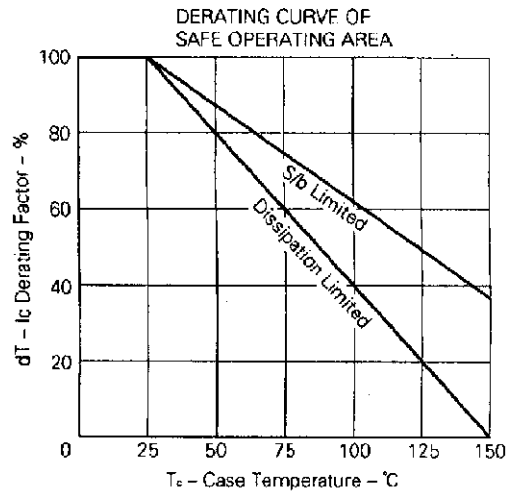
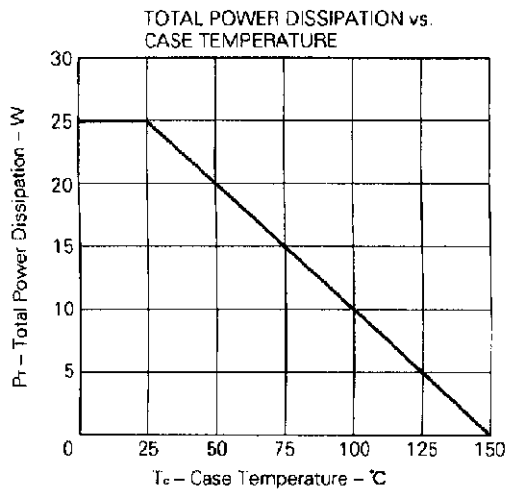
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|------------------------------|--------------------|--|------|------|------|---------------|
| Collector cutoff current | I_{CBO} | $V_{CB} = -60\text{ V}, I_E = 0$ | | | -10 | μA |
| DC current gain | h_{FE1}^{**} | $V_{CE} = -5.0\text{ V}, I_C = -0.5\text{ A}$ | 100 | | 400 | - |
| DC current gain | h_{FE2}^{**} | $V_{CE} = -5\text{ V}, I_C = -3\text{ A}$ | 20 | | | - |
| Collector saturation voltage | $V_{CE(sat)}^{**}$ | $I_C = -3.0\text{ A}, I_B = -300\text{ mA}$ | | | -1.0 | V |
| Base saturation voltage | $V_{BE(sat)}^{**}$ | $I_C = -3.0\text{ A}, I_B = -300\text{ mA}$ | | | -2.0 | V |
| Gain bandwidth product | f_T | $V_{CE} = -5.0\text{ V}, I_C = -0.5\text{ A}$ | | 5 | | MHz |
| Collector capacitance | C_{ob} | $V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$ | | 80 | | pF |
| Turn-on time | t_{on} | $I_C = -2.0\text{ A}, I_{B1} = -I_{B2} = -200\text{ mA},$ $R_L = 15\ \Omega, V_{CC} \cong -30\text{ V}$ Refer to the test circuit. | | 0.4 | | μs |
| Storage time | t_{stg} | | | 1.7 | | μs |
| Fall time | t_f | | | 0.5 | | μs |

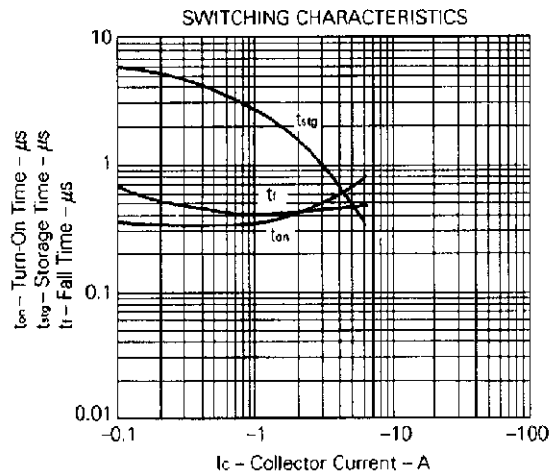
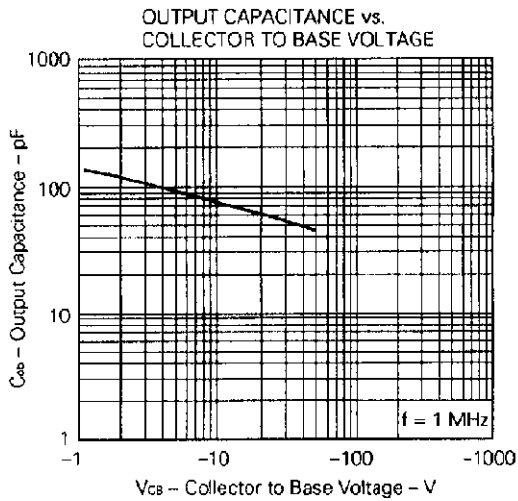
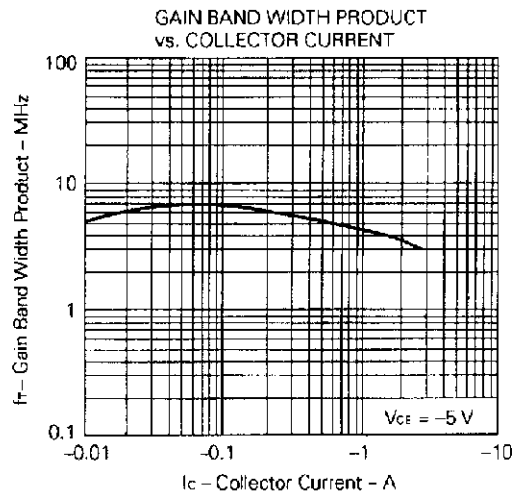
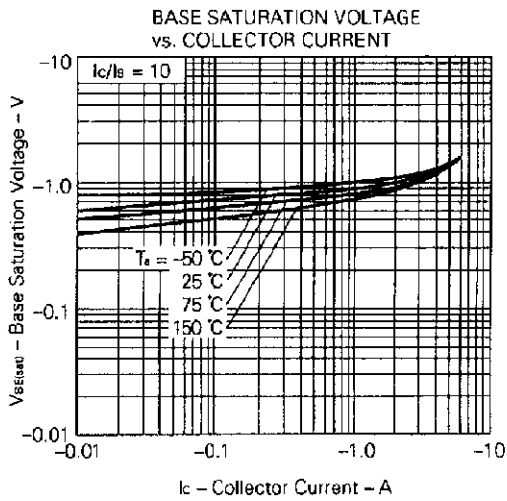
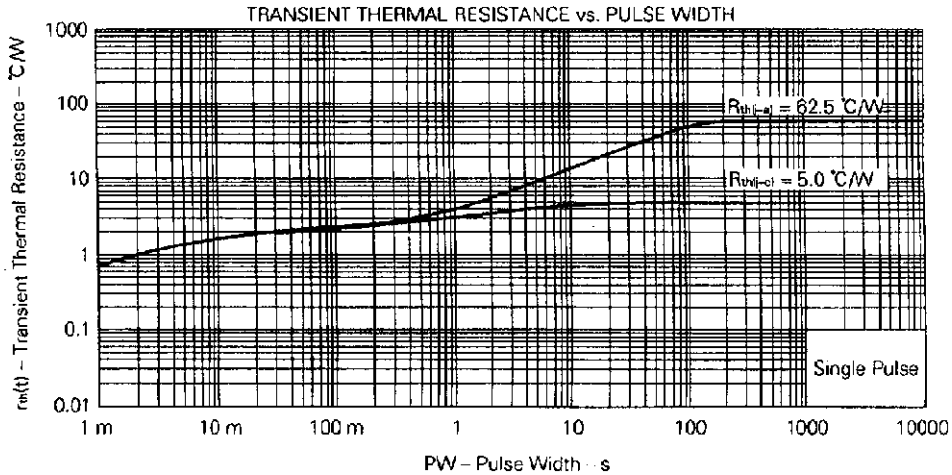
** Pulse test $PW \leq 350\ \mu\text{s}$, duty cycle $\leq 2\%$

SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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