

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1743 is a power transistor developed for high-speed switching and features a high h_{FE} at low $V_{CE(sat)}$. This transistor is ideal for use as a driver in DC/DC converters and actuators.

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

FEATURES

- High h_{FE} and low $V_{CE(sat)}$:
 $h_{FE} \geq 100$ ($V_{CE} = -2$ V, $I_C = -2$ A)
 $V_{CE(sat)} \leq 0.3$ V ($I_C = -6$ A, $I_B = -0.3$ A)
- Full-mold package that does not require an insulating board or bushing

QUALITY GRADES

- Standard
 Please refer to "Quality Grades on NEC Semiconductor Devices" (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

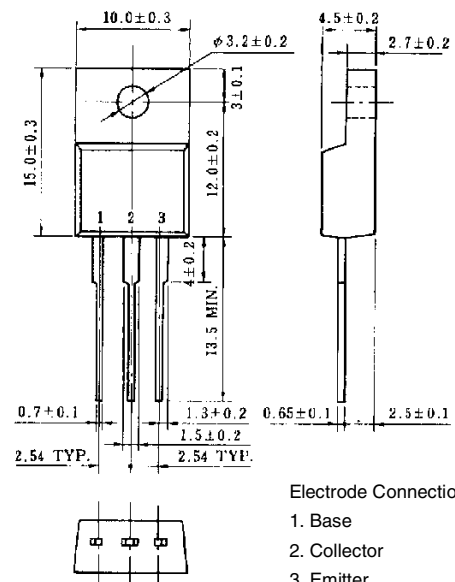
ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Ratings | Unit |
|------------------------------|------------------------------------|-------------|------------------|
| Collector to base voltage | V_{CBO} | -100 | V |
| Collector to emitter voltage | V_{CEO} | -60 | V |
| Emitter to base voltage | V_{EBO} | -7.0 | V |
| Collector current (DC) | $I_{C(DC)}$ | -10 | A |
| Collector current (pulse) | $I_{C(pulse)}^*$ | -20 | A |
| Base current (DC) | $I_{B(DC)}$ | -5.0 | A |
| Total power dissipation | P_T ($T_C = 25^\circ\text{C}$) | 30 | 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 | $^\circ\text{C}$ |

* $PW \leq 300 \mu\text{s}$, duty cycle $\leq 10\%$

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 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

PACKAGE DRAWING (UNIT: mm)



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

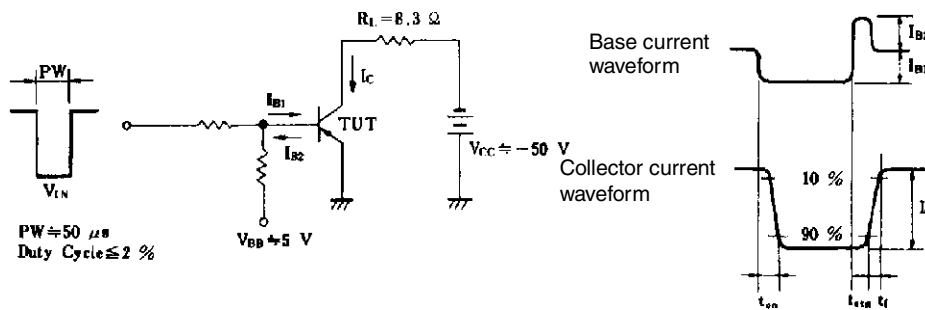
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|------------------------------|------------------|---|------|------|------|---------|
| Collector to emitter voltage | $V_{CE0(SUS)}$ | $I_C = -6.0 A, I_B = -0.6 A, L = 1 mH$ | -60 | | | V |
| Collector to emitter voltage | $V_{CEX(SUS)}$ | $I_C = -6.0 A, I_{B1} = -I_{B2} = -0.6 A, V_{BE(OFF)} = 1.5 V, L = 180 \mu H, \text{clamped}$ | -60 | | | V |
| Collector cutoff current | I_{CBO} | $V_{CB} = -60 V, I_E = 0$ | | | -10 | μA |
| Collector cutoff current | I_{CER} | $V_{CE} = -60 V, R_{BE} = 50 \Omega, T_a = 125^\circ C$ | | | -1.0 | mA |
| Collector cutoff current | I_{CEX1} | $V_{CE} = -60 V, V_{BE(OFF)} = 1.5 V$ | | | -10 | μA |
| Collector cutoff current | I_{CEX2} | $V_{CE} = -60 V, V_{BE(OFF)} = 1.5 V, T_a = 125^\circ C$ | | | -1.0 | mA |
| Emitter cutoff current | I_{EBO} | $V_{EB} = -5.0 V, I_C = 0$ | | | -10 | μA |
| DC current gain | h_{FE1}^* | $V_{CE} = -2.0 V, I_C = -1.0 A$ | 100 | | | |
| DC current gain | h_{FE2}^* | $V_{CE} = -2.0 V, I_C = -2.0 A$ | 100 | | 400 | |
| DC current gain | h_{FE3}^* | $V_{CE} = -2.0 V, I_C = -6.0 A$ | 60 | | | |
| Collector saturation voltage | $V_{CE(sat)1}^*$ | $I_C = -6.0 A, I_B = -0.3 A$ | | | -0.3 | V |
| Collector saturation voltage | $V_{CE(sat)2}^*$ | $I_C = -8.0 A, I_B = -0.4 A$ | | | -0.5 | V |
| Base saturation voltage | $V_{BE(sat)1}^*$ | $I_C = -6.0 A, I_B = -0.3 A$ | | | -1.2 | V |
| Base saturation voltage | $V_{BE(sat)2}^*$ | $I_C = -8.0 A, I_B = -0.4 A$ | | | -1.5 | V |
| Collector capacitance | C_{ob} | $V_{CB} = -10 V, I_E = 0, f = 1.0 MHz$ | | 230 | | pF |
| Gain bandwidth product | f_T | $V_{CE} = -10 V, I_C = -1.0 A$ | | 80 | | MHz |
| Turn-on time | t_{on} | $I_C = -6.0 A, R_L = 8.3 \Omega, I_{B1} = -I_{B2} = -0.3 A, V_{CC} \cong -50 V$ Refer to the test circuit. | | | 0.3 | μs |
| Storage time | t_{stg} | | | | 1.5 | μs |
| Fall time | t_f | | | | 0.3 | μs |

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

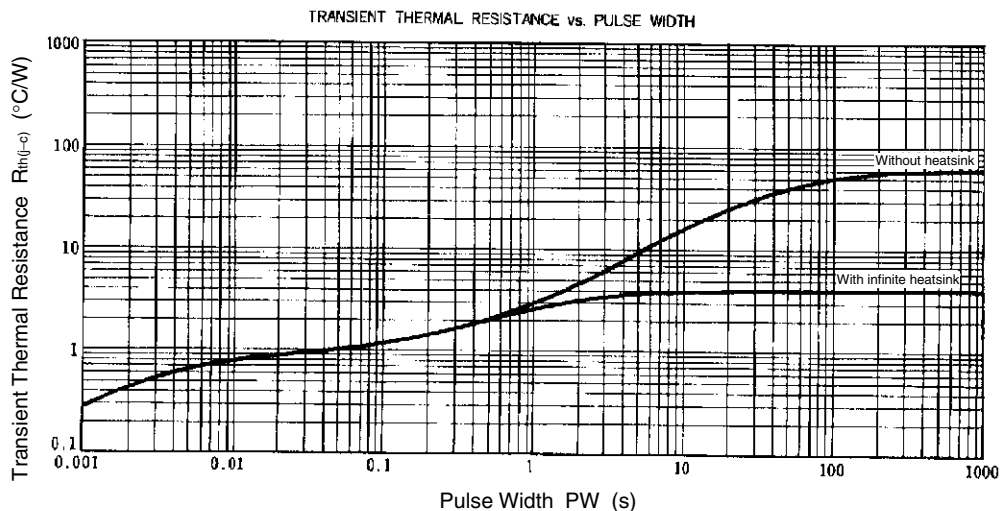
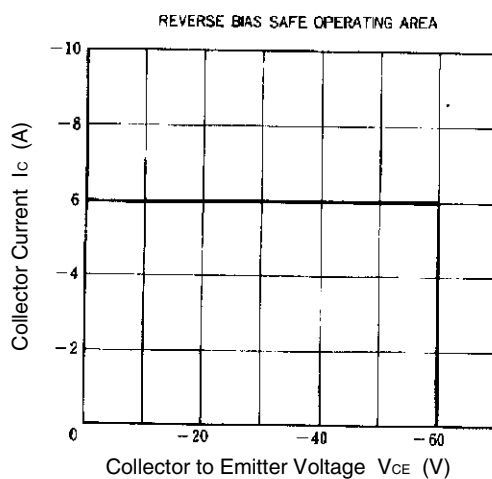
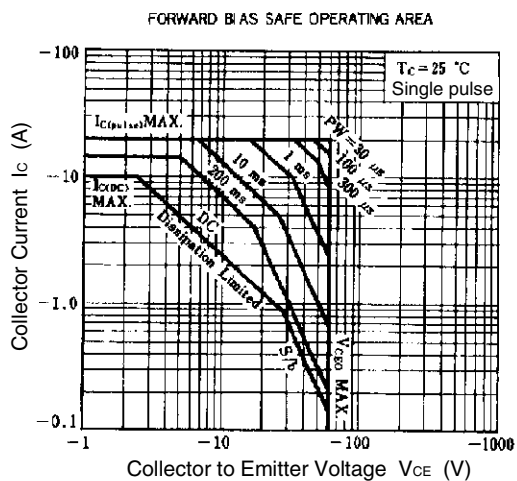
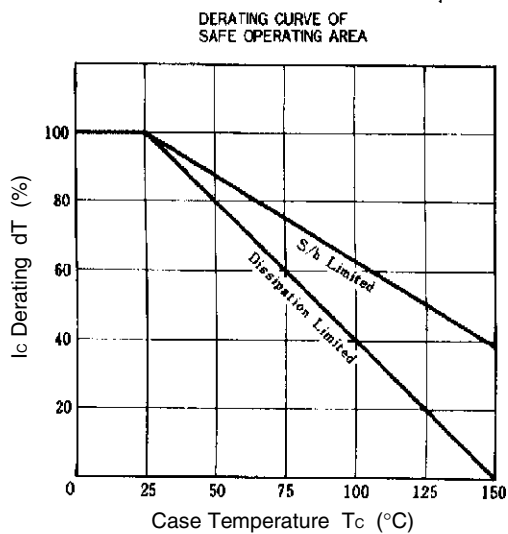
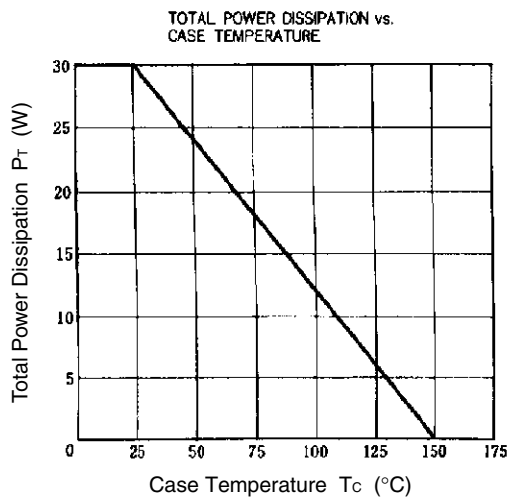
hFE CLASSIFICATION

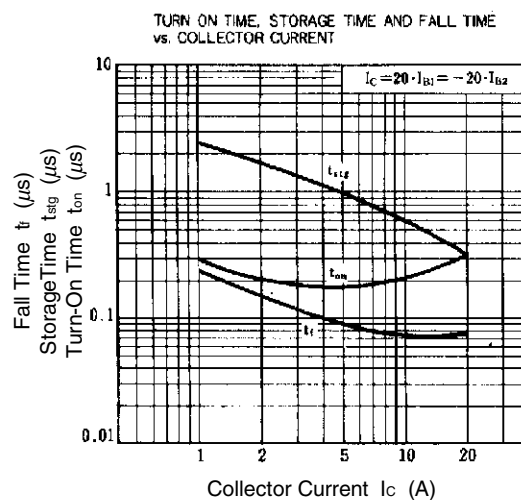
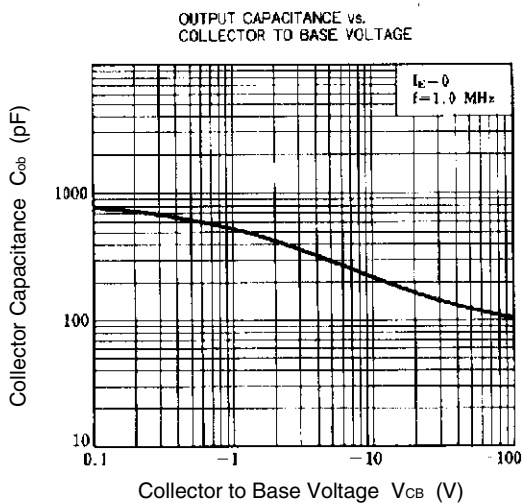
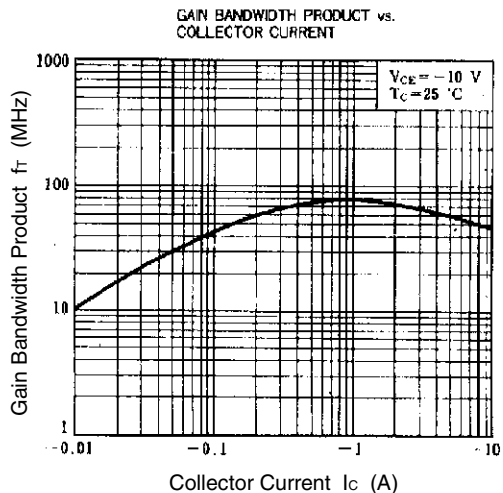
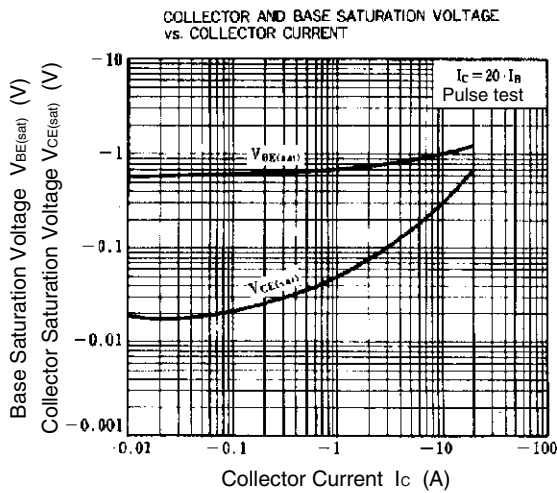
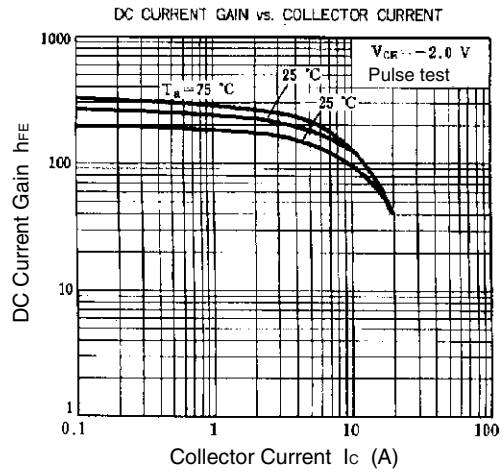
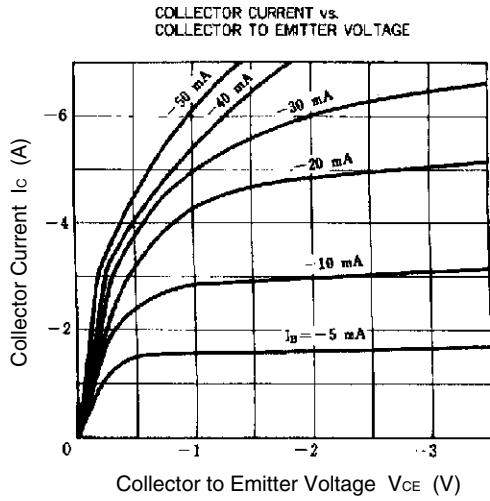
| Marking | M | L | K |
|-----------|------------|------------|------------|
| h_{FE2} | 100 to 200 | 150 to 300 | 200 to 400 |

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



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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