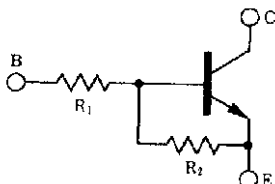


# COMPOUND TRANSISTOR BA1A3Q

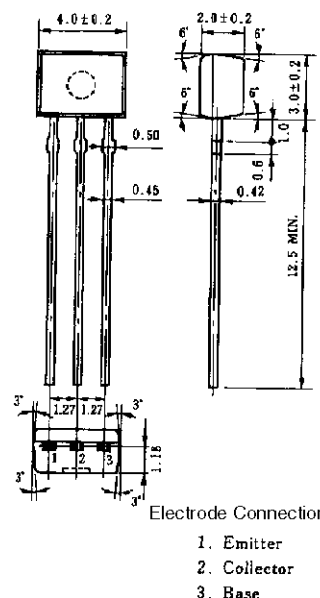
on-chip resistor NPN silicon epitaxial transistor  
For mid-speed switching

### FEATURES

- On-chip bias resistor  
( $R_1 = 1.0 \text{ k}\Omega$ ,  $R_2 = 10 \text{ k}\Omega$ )
- Complementary transistor with BN1A3Q



### PACKAGE DRAWING (UNIT: mm)



### 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 | $V_{CEO}$        | 50          | V                |
| Emitter to base voltage      | $V_{EBO}$        | 5           | V                |
| Collector current (DC)       | $I_{C(DC)}$      | 100         | mA               |
| Collector current (Pulse)    | $I_{C(pulse)}$ * | 200         | mA               |
| Total power dissipation      | $P_T$            | 250         | mW               |
| Junction temperature         | $T_j$            | 150         | $^\circ\text{C}$ |
| Storage temperature          | $T_{stg}$        | -55 to +150 | $^\circ\text{C}$ |

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

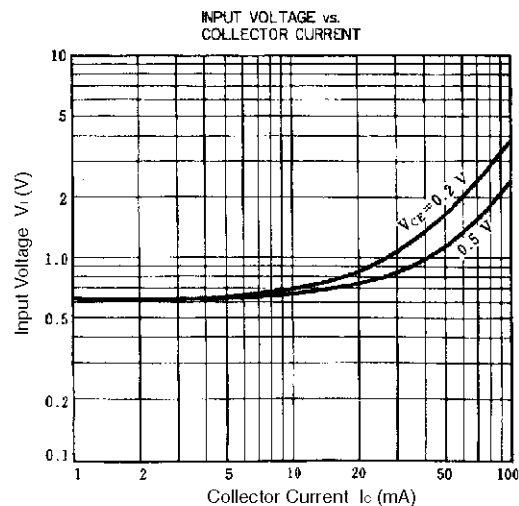
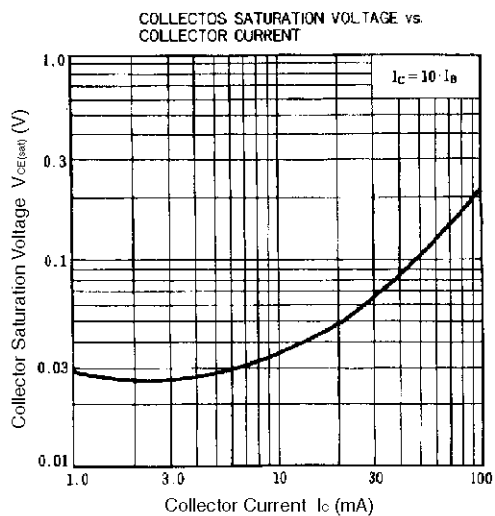
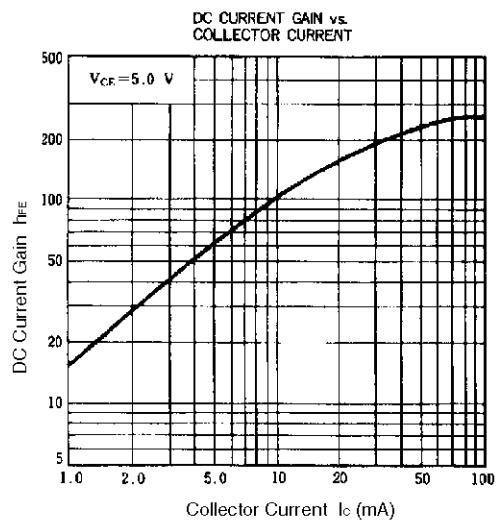
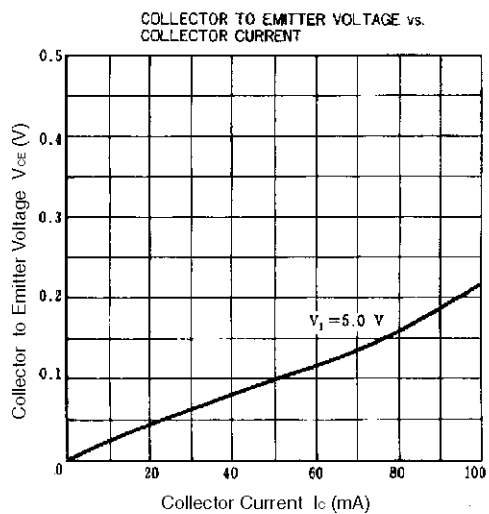
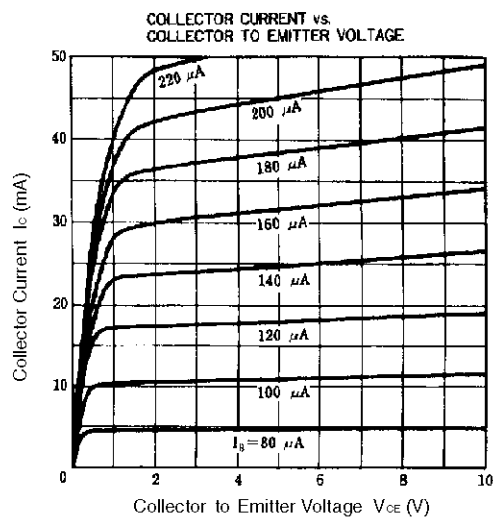
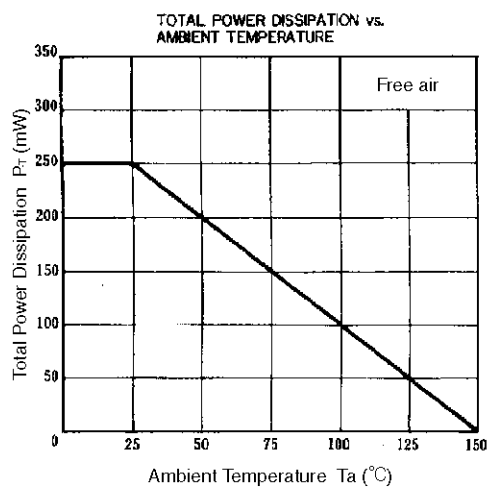
### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

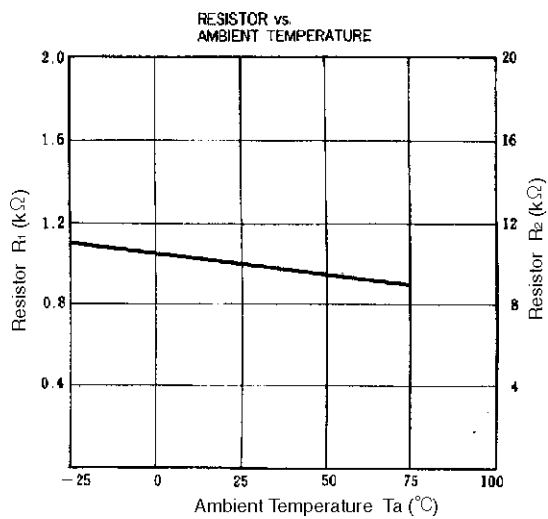
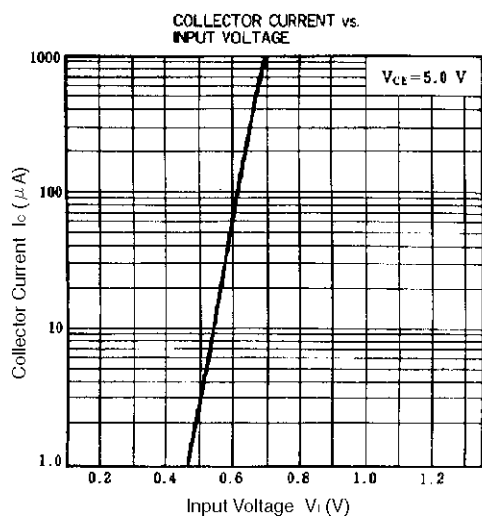
| Parameter                    | Symbol           | Conditions                                         | MIN. | TYP. | MAX. | Unit             |
|------------------------------|------------------|----------------------------------------------------|------|------|------|------------------|
| Collector cutoff current     | $I_{CBO}$        | $V_{CB} = 50 \text{ V}$ , $I_E = 0$                |      |      | 100  | nA               |
| DC current gain              | $h_{FE1}$ **     | $V_{CE} = 5.0 \text{ V}$ , $I_C = 5.0 \text{ mA}$  | 35   | 60   | 100  | —                |
| DC current gain              | $h_{FE2}$ **     | $V_{CE} = 5.0 \text{ V}$ , $I_C = 50 \text{ mA}$   | 80   | 230  |      | —                |
| Collector saturation voltage | $V_{CE(sat)}$ ** | $I_C = 5.0 \text{ mA}$ , $I_B = 0.25 \text{ mA}$   |      | 0.05 | 0.2  | V                |
| Low level input voltage      | $V_{IL}$ **      | $V_{CE} = 5.0 \text{ V}$ , $I_C = 100 \mu\text{A}$ |      | 0.7  | 0.5  | V                |
| High level input voltage     | $V_{IH}$ **      | $V_{CE} = 0.2 \text{ V}$ , $I_C = 5.0 \text{ mA}$  | 2.0  | 1.0  |      | V                |
| Input resistance             | $R_1$            |                                                    | 0.7  | 1.0  | 1.3  | $\text{k}\Omega$ |
| E-to-B resistance            | $R_2$            |                                                    | 7    | 10   | 13   | $\text{k}\Omega$ |
| Turn-on time                 | $t_{on}$         | $V_{CC} = 5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$ |      |      | 0.2  | $\mu\text{s}$    |
| Storage time                 | $t_{stg}$        | $V_i = 5 \text{ V}$ , $PW = 2 \mu\text{s}$         |      |      | 5.0  | $\mu\text{s}$    |
| Turn-off time                | $t_{off}$        | duty cycle $\leq 2 \%$                             |      |      | 6.0  | $\mu\text{s}$    |

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

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





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