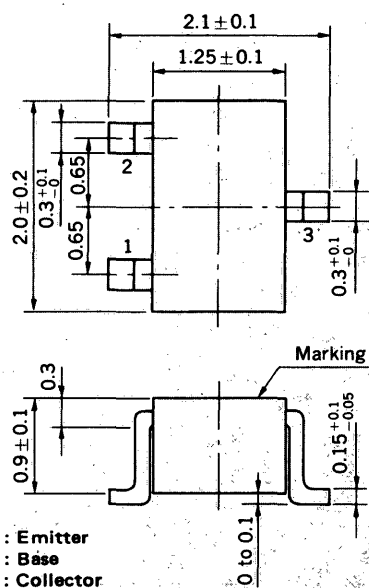
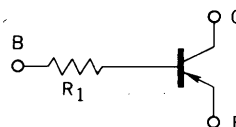


**MEDIUM SPEED SWITCHING**  
**RESISTOR BUILT-IN TYPE PNP TRANSISTOR**
**PACKAGE DIMENSIONS**  
 in millimeters
**FEATURES**

- Resistor Built-in TYPE



$R_1 = 47 \text{ k}\Omega$

- Complementary to GA1L4Z

**ABSOLUTE MAXIMUM RATINGS**Maximum Voltages and Currents ( $T_a = 25^\circ\text{C}$ )

|                              |           |      |    |
|------------------------------|-----------|------|----|
| 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)       | $I_C$     | -100 | mA |
| Collector Current (Pulse)    | $I_C$     | -200 | mA |

Maximum Power Dissipation

|                                                                      |       |     |    |
|----------------------------------------------------------------------|-------|-----|----|
| Total Power Dissipation<br>at $25^\circ\text{C}$ Ambient Temperature | $P_T$ | 150 | mW |
|----------------------------------------------------------------------|-------|-----|----|

Maximum Temperatures

|                           |           |             |                  |
|---------------------------|-----------|-------------|------------------|
| Junction Temperature      | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

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

| CHARACTERISTIC               | SYMBOL          | MIN. | TYP.  | MAX. | UNIT          | TEST CONDITIONS                                                                                                                 |
|------------------------------|-----------------|------|-------|------|---------------|---------------------------------------------------------------------------------------------------------------------------------|
| Collector Cutoff Current     | $I_{CBO}$       |      |       | -100 | nA            | $V_{CB} = -50 \text{ V}, I_E = 0$                                                                                               |
| DC Current Gain              | $h_{FE1}^*$     | 135  | 230   | 600  |               | $V_{CE} = -5.0 \text{ V}, I_C = -5.0 \text{ mA}$                                                                                |
| DC Current Gain              | $h_{FE2}^*$     | 100  | 190   |      |               | $V_{CE} = -5.0 \text{ V}, I_C = -50 \text{ mA}$                                                                                 |
| Collector Saturation Voltage | $V_{CE(sat)}^*$ |      | -0.07 | -0.2 | V             | $I_C = -5.0 \text{ mA}, I_B = -0.25 \text{ mA}$                                                                                 |
| Low-Level Input Voltage      | $V_{IL}^*$      |      | -0.58 | -0.5 | V             | $V_{CE} = -5.0 \text{ V}, I_C = -100 \mu\text{A}$                                                                               |
| High-Level Input Voltage     | $V_{IH}^*$      | -4.0 | -1.8  |      | V             | $V_{CE} = -0.2 \text{ V}, I_C = -5.0 \text{ mA}$                                                                                |
| Input Resistor               | $R_1$           | 32.9 | 47.0  | 61.1 | k $\Omega$    |                                                                                                                                 |
| Turn-on Time                 | $t_{on}$        |      |       | 0.2  | $\mu\text{s}$ | $V_{CC} = -5 \text{ V}, V_{in} = -5 \text{ V}$<br>$R_L = 1 \text{ k}\Omega$<br>$PW = 2 \mu\text{s}, \text{Duty Cycle} \leq 2\%$ |
| Storage Time                 | $t_{stg}$       |      |       | 5.0  | $\mu\text{s}$ |                                                                                                                                 |
| Turn-off Time                | $t_{off}$       |      |       | 6.0  | $\mu\text{s}$ |                                                                                                                                 |

\* Pulsed:  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$  **$h_{FE}$  Classification**

| Marking   | M61        | M62        | M63        |
|-----------|------------|------------|------------|
| $h_{FE1}$ | 135 to 270 | 200 to 400 | 300 to 600 |

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