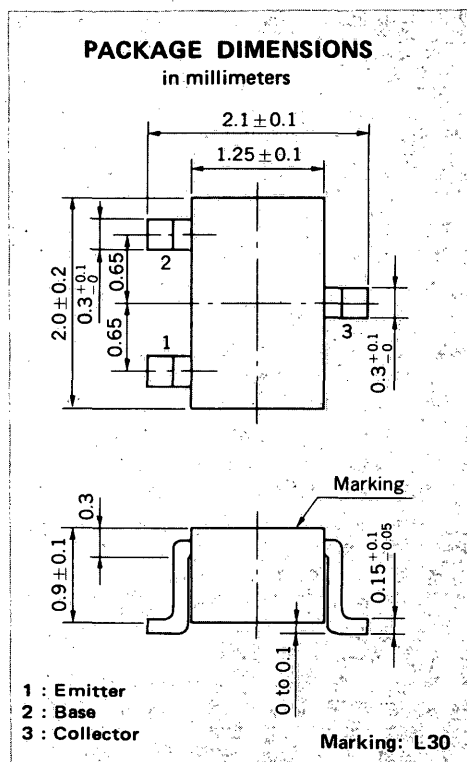
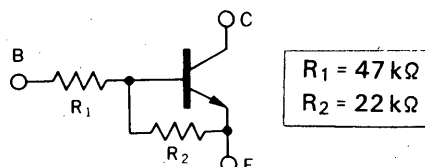


# MEDIUM SPEED SWITCHING RESISTOR BUILT-IN TYPE NPN TRANSISTOR

**FEATURES**

- Resistors Built-in TYPE



- Complementary to GN1L4L

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

|                              |           |     |    |
|------------------------------|-----------|-----|----|
| Collector to Base Voltage    | $V_{CB0}$ | 60  | V  |
| Collector to Emitter Voltage | $V_{CEO}$ | 50  | V  |
| Emitter to Base Voltage      | $V_{EBO}$ | 15  | 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              | $h_{FE1}^*$     | 60   | 120  | 195  |               | $V_{CE} = 5.0 \text{ V}, I_C = 5.0 \text{ mA}$                                                                                |
| DC Current Gain              | $h_{FE2}^*$     | 90   | 340  |      |               | $V_{CE} = 5.0 \text{ V}, I_C = 50 \text{ mA}$                                                                                 |
| Collector Saturation Voltage | $V_{CE(sat)}^*$ |      | 0.04 | 0.2  | V             | $I_C = 5.0 \text{ mA}, I_B = 0.25 \text{ mA}$                                                                                 |
| Low-Level Input Voltage      | $V_{IL}^*$      |      | 1.7  | 0.9  | V             | $V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A}$                                                                               |
| High-Level Input Voltage     | $V_{IH}^*$      | 6.0  | 2.5  |      | V             | $V_{CE} = 0.2 \text{ V}, I_C = 5.0 \text{ mA}$                                                                                |
| Input Resistor               | $R_1$           | 32.9 | 47.0 | 61.1 | k $\Omega$    |                                                                                                                               |
| E-B Resistor                 | $R_2$           | 15.4 | 22.0 | 28.6 | k $\Omega$    |                                                                                                                               |
| Turn-on Time                 | $t_{on}$        |      | 0.38 | 1.0  | $\mu\text{s}$ | $V_{CC} = 5 \text{ V}, V_{in} = 5 \text{ V}$<br>$R_L = 1 \text{ k}\Omega$<br>$PW = 2 \mu\text{s}, \text{Duty Cycle} \leq 2\%$ |
| Storage Time                 | $t_{stg}$       |      | 1.2  | 3.0  | $\mu\text{s}$ |                                                                                                                               |
| Turn-off Time                | $t_{off}$       |      | 1.6  | 5.0  | $\mu\text{s}$ |                                                                                                                               |

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

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