

**2N167A**  
**NPN GERMANIUM TRANSISTOR**

absolute maximum ratings: (25°C)

|                           |                  |          |
|---------------------------|------------------|----------|
| <b>Voltages</b>           |                  |          |
| Collector to Base         | V <sub>CB</sub>  | 30 volts |
| Collector to Emitter      | V <sub>CE</sub>  | 30 volts |
| Emitter to Base           | V <sub>EB</sub>  | 5 volts  |
| <b>Current</b>            |                  |          |
| Collector                 | I <sub>C</sub>   | 75 ma    |
| Emitter                   | I <sub>E</sub>   | -75 ma   |
| <b>Dissipation</b>        |                  |          |
| Collector (25°C)*         | P <sub>C</sub>   | 65 mw    |
| Total Transistor (25°C)** | P <sub>M</sub>   | 75 mw    |
| <b>Temperature</b>        |                  |          |
| Storage                   | T <sub>STG</sub> | 85°C     |

\*Derate 1.1 mw/°C increase in ambient temperature.

\*\*Derate 1.25 mw/°C increase in ambient temperature.

electrical characteristics: (25°C—unless otherwise specified)

**D-C CHARACTERISTICS**

|  | Min. | Design Center | Max. |         |
|--|------|---------------|------|---------|
| Forward Current Transfer Ratio (I <sub>C</sub> = 8 ma; V <sub>CE</sub> = 1v) | 17   | 30            | 90   |         |
| Base Input Voltage (I <sub>B</sub> = .47 ma; I <sub>C</sub> = 8 ma)          | .3*  | .41           | .6*  | * volts |
| Collector to Emitter Voltage (Base Open; I <sub>C</sub> = .3 ma)             | 30   |               |      | volts   |
| Saturation Voltage (I <sub>B</sub> = .8 ma; I <sub>C</sub> = 8 ma)           |      | .35           |      | volts   |

**CUTOFF CHARACTERISTICS**

|  |                 |    |     |    |
|--|-----------------|----|-----|----|
| Collector Current (I <sub>E</sub> = 0; V <sub>CE</sub> = 15v; T <sub>A</sub> = 25°C) | I <sub>CO</sub> | .6 | 1.5 | μA |
| Collector Current (I <sub>E</sub> = 0; V <sub>CE</sub> = 15v; T <sub>A</sub> = 71°C) | I <sub>CO</sub> | 11 | 29  | μA |
| Emitter Current (I <sub>C</sub> = 0; V <sub>EB</sub> = 5v; T <sub>A</sub> = 25°C)    | I <sub>EO</sub> | .4 | 1.5 | μA |
| Emitter Current (I <sub>C</sub> = 0; V <sub>EB</sub> = 5v; T <sub>A</sub> = 71°C)    | I <sub>EO</sub> | 8  |     | μA |

**HIGH FREQUENCY CHARACTERISTICS (COMMON BASE)**

|   | Min.            | Design Center | Max. |                   |
|---|-----------------|---------------|------|-------------------|
| (V <sub>CE</sub> = 5v; I <sub>B</sub> = 1 ma) |                 |               |      |                   |
| Alpha Cutoff Frequency                        | f <sub>α</sub>  | 5.0           | 9.0  | mc                |
| Collector Capacity (f = 1 mc)                 | C <sub>cb</sub> |               | 2.5  | μμf               |
| Voltage Feedback Ratio (f = 1 mc)             | h <sub>rb</sub> |               | 7.3  | x10 <sup>-4</sup> |

**LOW FREQUENCY CHARACTERISTICS (COMMON BASE)**

|   | Min.            | Design Center | Max. |                   |
|---|-----------------|---------------|------|-------------------|
| (V <sub>CE</sub> = 5v; I <sub>B</sub> = -1 ma; f = 270 cps) |                 |               |      |                   |
| Forward Current Transfer Ratio                              | h <sub>fb</sub> | .952          | .985 | .995*             |
| Output Admittance   | h <sub>ob</sub> | .1*           | .2   | .7*               |
| Input Impedance   | h <sub>ib</sub> | 25*           | 55   | 82*               |
| Reverse Voltage Transfer Ratio                              | h <sub>rb</sub> |               | 1.5  | μmhos             |
|   |                 |               |      | ohms              |
|   |                 |               |      | x10 <sup>-4</sup> |

**SWITCHING CHARACTERISTICS, (See circuit)**

|   | Min.           | Design Center | Max. |      |
|---|----------------|---------------|------|------|
| (I <sub>C</sub> = 8 ma; I <sub>B1</sub> = .8 ma; I <sub>B2</sub> = .8 ma) |                |               |      |      |
| Turn-on Time  | t <sub>o</sub> | .4            |      | μsec |
| Storage Time  | t <sub>s</sub> | .7            |      | μsec |
| Fall Time   | t <sub>f</sub> | .2            |      | μsec |

\*These limits are design limits within which 98% of production normally fall.

