

# New Jersey Semi-Conductor Products, Inc.

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## Silicon Transistors

|        |        |
|--------|--------|
|        |        |
| 2N5820 | 2N5821 |
| 2N5822 | 2N5823 |

These silicon, planar, passivated, epitaxial transistors are intended to satisfy a wide range of general purpose applications at audio low and intermediate frequencies.

### Features:

- Excellent Gain Linearity over Wide Range of Collector Currents to 500mA and Beyond
- High Collector Current Ratings: 1000 mA.

- Integral Heat Sinks Available.
- Epoxy Encapsulation with Proved Reliability—excellent characteristic stability under environmental stresses, 85°C—85% RH.

Voltage and current values for PNP devices are negative; observe proper bias polarity

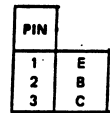
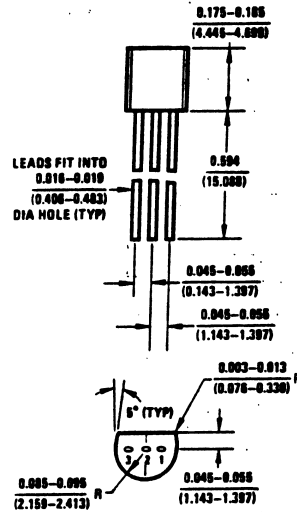
TO-92

### absolute maximum ratings: (25°C) (unless otherwise specified)

| Voltages   |           |             |       |
|--|-----------|-------------|-------|
| *Collector to Emitter  | $V_{CE0}$ | 60          | Volts |
| *Emitter to Base   | $V_{EB0}$ | 5           | Volts |
| *Collector to Base   | $V_{CB0}$ | 70          | Volts |
| Collector to Emitter   | $V_{CES}$ | 70          | Volts |
| Current  |           |             |       |
| *Collector (Continuous)  | $I_C$     | 750         | mA    |
| Collector (Pulsed, 300 $\mu$ sec. pulse width, $\approx$ 2% duty cycle)          | $I_{CM}$  | 1000        | mA    |
| Dissipation  |           |             |       |
| *Total Power (Free Air, $T_A = 25^\circ\text{C}$ ) <sup>(1)</sup>                | $P_T$     | 500         | mW    |
| Total Power with Heatsink (Free Air, $T_A = 25^\circ\text{C}$ ) <sup>(2)</sup>   | $P_T$     | 700         | mW    |
| Total Power with Heatsink (Case Temp., $T_C = 25^\circ\text{C}$ ) <sup>(3)</sup> | $P_T$     | 1000        | mW    |
| Temperature  |           |             |       |
| *Storage   | $T_{STO}$ | -65 to +150 | °C    |
| *Operating   | $T_J$     | -65 to +135 | °C    |
| *Lead soldering (1/16" $\pm$ 1/32" from case for 10 sec. max.)                   | $T_L$     | +260        | °C    |

<sup>(1)</sup>Indicates JEDEC Registered values.

<sup>(2)</sup>Derate 3.55 mW/°C increase in ambient temperature above 25°C. <sup>(3)</sup>Derate 6.36 mW/°C increase in ambient temperature above 25°C. <sup>(4)</sup>Derate 9.09 mW/°C increase in case temperature above 25°C.



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

NOTE: Characteristics apply to both heatsinked and non-heatsinked devices.

#### STATIC CHARACTERISTICS

|   |               | Min. | Max. |               |
|---|---------------|------|------|---------------|
| Collector Cutoff Current ( $V_{CB} = 25\text{V}$ )    | $I_{CBO}$     | —    | 100  | nA            |
| ( $V_{CB} = 25\text{V}$ , $T_A = 100^\circ\text{C}$ ) | $I_{CBO}$     | —    | 15   | $\mu\text{A}$ |
| Emitter Cutoff Current                                | $I_{EBO}$     | —    | 10   | $\mu\text{A}$ |
| * ( $V_{EB} = 5\text{V}$ )                            |               |      |      |               |
| Forward Current Transfer Ratio                        |               |      |      |               |
| * ( $I_C = 2\text{ mA}$ , $V_{CE} = 2\text{V}$ )      |               |      |      |               |
| 2N5820, 2N5821  | $h_{FE}$      | 60   | 120  |               |
| 2N5822, 2N5823  | $h_{FE}$      | 100  | 200  |               |
| * ( $I_C = 500\text{ mA}$ , $V_{CE} = 2\text{V}$ )    |               |      |      |               |
| 2N5820, 2N5821  | $h_{FE}$      | 20   | —    |               |
| 2N5822, 2N5823  | $h_{FE}$      | 25   | —    |               |
| Collector-Emitter Breakdown Voltage                   |               |      |      |               |
| * ( $I_C = 10\text{ mA}$ )                            | $V_{(BR)CEO}$ | 60   | —    | Volts         |
| ( $I_C = 10\text{ }\mu\text{A}$ )                     | $V_{(BR)CES}$ | 70   | —    | Volts         |
| Emitter-Base Breakdown Voltage                        | $V_{(BR)EB0}$ | 5    | —    | Volts         |
| * ( $I_E = 10\text{ }\mu\text{A}$ )                   |               |      |      |               |
| Collector Saturation Voltage                          | $V_{CE(SAT)}$ | —    | 0.75 | Volts         |
| * ( $I_C = 500\text{ mA}$ , $I_E = 50\text{ mA}$ )    |               |      |      |               |
| Base Saturation Voltage                               | $V_{BE(SAT)}$ | —    | 1.2  | Volts         |
| * ( $I_C = 500\text{ mA}$ , $I_E = 50\text{ mA}$ )    |               |      |      |               |
| Base-Emitter Voltage                                  | $V_{BE}$      | .60  | 1.1  | Volts         |
| * ( $I_C = 500\text{ mA}$ , $V_{CE} = 2\text{V}$ )    |               |      |      |               |

#### DYNAMIC CHARACTERISTICS

##### Collector-Base Capacitance

\* ( $V_{CB} = 10\text{V}$ ,  $f = 1\text{ MHz}$ )

|          | Min. | Max. |    |
|----------|------|------|----|
| $C_{cb}$ | —    | 15   | pF |

##### Input Capacitance, Common Base

( $V_{CB} = 0.5\text{V}$ ,  $f = 1\text{ MHz}$ )

|          |   |    |    |
|----------|---|----|----|
| $C_{cb}$ | — | 55 | pF |
|----------|---|----|----|

##### Gain Bandwidth Product

( $I_C = 50\text{ mA}$ ,  $V_{CE} = 2\text{V}$ ,  $f = 20\text{ MHz}$ )

2N5820, 2N5821  
2N5822, 2N5823

|       |     |   |     |
|-------|-----|---|-----|
| $f_T$ | 100 | — | MHz |
| $f_T$ | 120 | — | MHz |

<sup>(1)</sup>Indicates JEDEC registered values