

# New Jersey Semi-Conductor Products, Inc.

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BC171, A, B  
BC172, A, B, C  
BC174, A, B

TO-92  
Plastic Package

## Amplifier Transistors

ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless specified otherwise)

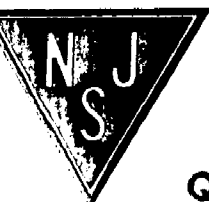
| DESCRIPTION                                      | SYMBOL         | BC174       | BC171 | BC172 | UNIT  |
|--|----------------|-------------|-------|-------|-------|
| Collector Emitter Voltage                        | $V_{CEO}$      | 65          | 45    | 25    | V     |
| Collector Base Voltage                           | $V_{CBO}$      | 80          | 50    | 30    | V     |
| Emitter Base Voltage                             | $V_{EBO}$      | 6           |       |       | V     |
| Collector Current Continuous                     | $I_C$          | 100         |       |       | mA    |
| Total Device Dissipation @ Ta=25°C               | $P_D$          | 350         |       |       | mW    |
| Derate Above 25°C                                |                | 2.8         |       |       | mW/°C |
| Total Device Dissipation @ Tc=25°C               | $P_D$          | 1.0         |       |       | W     |
| Derate Above 25°C                                |                | 8.0         |       |       | mW/°C |
| Operating And Storage Junction Temperature Range | $T_j, T_{stg}$ | -55 to +150 |       |       | °C    |

## THERMAL RESISTANCE

|                     |               |     |      |
|---------------------|---------------|-----|------|
| Junction to ambient | $R_{th(j-a)}$ | 357 | °C/W |
| Junction to case    | $R_{th(j-c)}$ | 125 | °C/W |

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise)

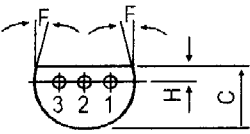
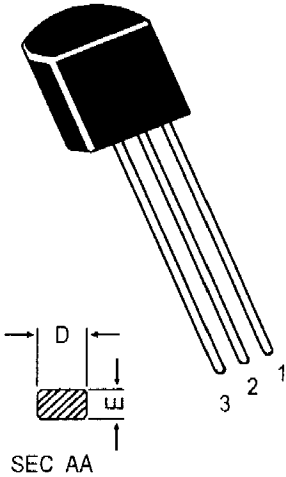
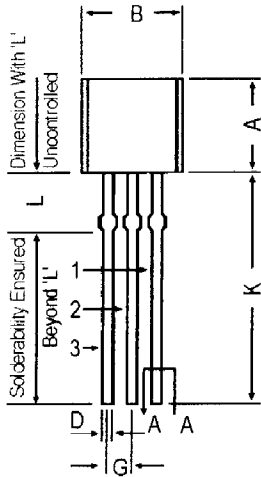
| DESCRIPTION                         | SYMBOL     | TEST CONDITION                          | VALUE |     |     | UNIT    |
|-------------------------------------|------------|---|-------|-----|-----|---------|
|                                     |            |   | MIN   | TYP | MAX |         |
| Collector Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C=2mA, I_B=0$                        |       |     |     |         |
|                                     | BC174      |   | 65    |     |     | V       |
|                                     | BC171      |   | 45    |     |     | V       |
|                                     | BC172      |   | 25    |     |     | V       |
| Emitter Base Breakdown Voltage      | $BV_{EBO}$ | $I_E=100\mu A, I_C=0$                   |       |     |     |         |
|                                     | ALL        |   | 6     |     |     | V       |
| Collector Cut off Current           | $I_{CES}$  |   |       |     |     |         |
|                                     | BC174      | $V_{CE}=70V, V_{BE}=0$                  |       |     | 15  | nA      |
|                                     | BC171      | $V_{CE}=50V, V_{BE}=0$                  |       |     | 15  | nA      |
|                                     | BC172      | $V_{CE}=35V, V_{BE}=0$                  |       |     | 15  | nA      |
|                                     |            | $V_{CE}=30V, V_{BE}=0, T_a=125^\circ C$ |       |     | 4   | $\mu A$ |



NJ Semi-Conductors reserves the right to change test conditions, parameters limits and package dimensions without notice information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**Quality Semi-Conductors**

| DESCRIPTION                                 | SYMBOL        | TEST CONDITION                  | VALUE |     |      | UNIT |
|---|---------------|---------------------------------|-------|-----|------|------|
|   |               |                                 | MIN   | TYP | MAX  |      |
| <b>DC Current Gain</b>                      | $h_{FE}$      | $V_{CE}=5V, I_C=10\mu A$        |       |     |      |      |
| BC171A, 2A, 4A                              |               |                                 |       | 90  |      |      |
| BC171B, 2B, 4B                              |               |                                 |       | 150 |      |      |
| BC172C                                      |               |                                 |       | 270 |      |      |
|   |               | $V_{CE}=5V, I_C=2mA$            |       |     |      |      |
| BC174                                       |               |                                 | 120   |     | 450  |      |
| BC171                                       |               |                                 | 120   |     | 800  |      |
| BC172                                       |               |                                 | 120   |     | 800  |      |
|   |               |                                 |       |     |      |      |
| BC171A, 2A, 4A                              |               |                                 | 120   |     | 220  |      |
| BC171B, 2B, 4B                              |               |                                 | 180   |     | 460  |      |
| BC172C                                      |               |                                 | 380   |     | 800  |      |
|   |               | $V_{CE}=5V, I_C=100mA$          |       |     |      |      |
| BC171A, 2A, 4A                              |               |                                 |       | 120 |      |      |
| BC171B, 2B, 4B                              |               |                                 |       | 180 |      |      |
| BC172C                                      |               |                                 |       | 300 |      |      |
| <b>Base Emitter Saturation Voltage</b>      | $V_{BE(sat)}$ | $I_C=10mA, I_B=0.5mA$           |       | 0.7 |      | V    |
| <b>Collector Emitter Saturation Voltage</b> | $V_{CE(sat)}$ | $I_C=10mA, I_B=0.5mA$           |       |     | 0.25 | V    |
|   |               | $I_C=100mA, I_B=5mA$            |       |     | 0.60 | V    |
| <b>Base Emitter on Voltage</b>              | $V_{BE(on)}$  | $I_C=2mA, V_{CE}=5V$            | 0.55  |     | 0.70 | V    |
| <b>DYNAMIC CHARACTERISTICS</b>              |               |                                 |       |     |      |      |
| <b>Transition Frequency</b>                 | $f_T$         | $I_C=10mA, V_{CE}=5V$           |       |     |      |      |
| BC171                                       |               | $f=100MHz$                      | 150   |     |      | MHz  |
| BC172                                       |               |                                 | 150   |     |      |      |
| BC174                                       |               |                                 | 150   |     |      |      |
| <b>Output Capacitance</b>                   | $C_{ob}$      | $I_E=0, V_{CB}=10V$             |       |     | 4.50 | pF   |
|   |               | $f=1MHz$                        |       |     |      |      |
| <b>Input Capacitance</b>                    | $C_{ib}$      | $I_C=0, V_{EB}=0.5V$            |       | 10  |      | pF   |
|   |               | $f=1MHz$                        |       |     |      |      |
| <b>Small Signal Current Gain</b>            | $ h_{fe} $    | $V_{CE}=5V, I_C=2mA$            |       |     |      |      |
| BC171, 2, 4                                 |               | $f=1KHz$                        | 125   |     | 900  |      |
| BC171A, 2A, 4A,                             |               |                                 | 125   |     | 260  |      |
| BC171B, 2B, 4B                              |               |                                 | 240   |     | 500  |      |
| BC172C                                      |               |                                 | 450   |     | 900  |      |
| <b>Noise Figure</b>                         | NF            | $V_{CE}=5V, I_C=0.2mA$          |       |     | 10   | dB   |
| BC171                                       |               | $R_S=2K\Omega, f=1KHz, f=200Hz$ |       |     | 10   |      |
| BC172                                       |               |                                 |       |     | 10   |      |
| BC174                                       |               |                                 |       |     |      |      |



| DIM | MIN.  | MAX.  |
|-----|-------|-------|
| A   | 4.32  | 5.33  |
| B   | 4.45  | 5.20  |
| C   | 3.18  | 4.19  |
| D   | 0.41  | 0.55  |
| E   | 0.35  | 0.50  |
| F   | 5 DEG |       |
| G   | 1.14  | 1.40  |
| H   | 1.14  | 1.53  |
| K   | 12.70 | —     |
| L   | 1.982 | 2.082 |

**PIN CONFIGURATION**

1. EMITTER
2. BASE
3. COLLECTOR

All diminsions in mm.

**All dimensions in mm unless specified otherwise**

| ITEM                                 | SYMBOL | SPECIFICATION |      |       |              | REMARKS   |
|--------------------------------------|--------|---------------|------|-------|--------------|---|
|                                      |        | MIN.          | NOM. | MAX.  | TOL.         |   |
| BODY WIDTH                           | A1     | 4.0           |      | 4.8   |              | CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH TO BE MEASURED AT BOTTOM OF CLINCH |
| BODY HEIGHT                          | A      | 4.8           |      | 5.2   |              |   |
| BODY THICKNESS                       | T      | 3.9           |      | 4.2   |              |   |
| PITCH OF COMPONENT                   | P      |               | 12.7 |       | ±1           |   |
| FEED HOLE PITCH                      | Po     |               | 12.7 |       | ±0.3         |   |
| FEED HOLE CENTRE TO COMPONENT CENTRE | P2     |               | 6.35 |       | ±0.4         | TO BE MEASURED AT BOTTOM OF CLINCH  |
| DISTANCE BETWEEN OUTER LEADS         | F      |               | 5.08 |       | +0.6<br>-0.2 |   |
| COMPONENT ALIGNMENT                  | Ah     |               | 0    | 1     |              | AT TOP OF BODY  |
| TAPE WIDTH                           | W      |               | 18   |       | ±0.5         | HOLD-DOWN TAPE POSITION   |
| HOLD-DOWN TAPE WIDTH                 | Wo     |               | 6    |       | ±0.2         |   |
| HOLE POSITION                        | W1     |               | 9    |       | +0.7<br>-0.5 |   |
| HOLD-DOWN TAPE POSITION              | W2     |               | 0.5  |       | ±0.2         | HOLD-DOWN TAPE POSITION   |
| LEAD WIRE CLINCH HEIGHT              | Ho     |               | 16   |       | ±0.5         |   |
| COMPONENT HEIGHT                     | H1     |               |      | 23.25 |              | H 0.3 - 0.6   |
| LENGTH OF SNIPPED LEADS              | L      |               |      | 11.0  |              |   |
| FEED HOLE DIAMETER                   | Do     |               | 4    |       | ±0.2         |   |
| TOTAL TAPE THICKNESS                 | t      |               |      | 1.2   |              |   |
| LEAD - TO - LEAD DISTANCE F1         | F2     |               | 2.54 |       | +0.4<br>-0.1 |   |
| CLINCH HEIGHT                        | H2     |               |      | 3     |              |   |
| PULL - OUT FORCE                     | (P)    | 6N            |      |       |              |   |

**NOTES**

1. MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2 mm.
2. MAXIMUM NON-CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1 mm IN 20 PITCHES.
3. HOLDDOWN TAPE NOT TO EXCEED BEYOND THE EDGE(S) OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
4. NO MORE THAN 3 CONSECUTIVE MISSING COMPONENTS ARE PERMITTED.
5. A TAPE TRAILER, HAVING AT LEAST THREE FEED HOLES ARE REQUIRED AFTER THE LAST COMPONENT.
6. SPLICES SHALL NOT INTERFERE WITH THE SPROCKET FEED HOLES.