

# LINEAR SYSTEMS

*Linear Integrated Systems*

## IT120A IT120 IT121 IT122 MONOLITHIC DUAL NPN TRANSISTORS

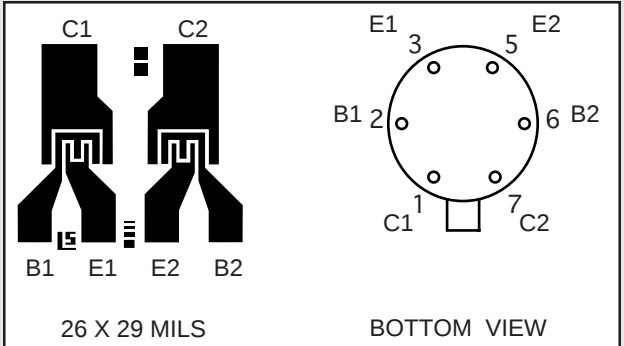
### FEATURES

Direct Replacement for Intersil IT120 Series  
Pin for Pin Compatible

### ABSOLUTE MAXIMUM RATINGS NOTE 1

(T<sub>A</sub> = 25°C unless otherwise noted)

|                                  |                   |                                   |
|----------------------------------|-------------------|-----------------------------------|
| I <sub>C</sub>                   | Collector Current | 10mA                              |
| <b>Maximum Temperatures</b>      |                   |                                   |
| Storage Temperature Range        |                   | -65°C to +200°C                   |
| Operating Temperature Range      |                   | -55°C to +150°C                   |
| <b>Maximum Power Dissipation</b> |                   |                                   |
|                                  |                   | <b>ONE SIDE</b> <b>BOTH SIDES</b> |
| Device Dissipation @ Free Air    |                   | 250mW      500mW                  |
| Linear Derating Factor           |                   | 2.3mW/°C      4.3mW/°C            |



### ELECTRICAL CHARACTERISTICS T<sub>A</sub> = 25°C (unless otherwise noted)

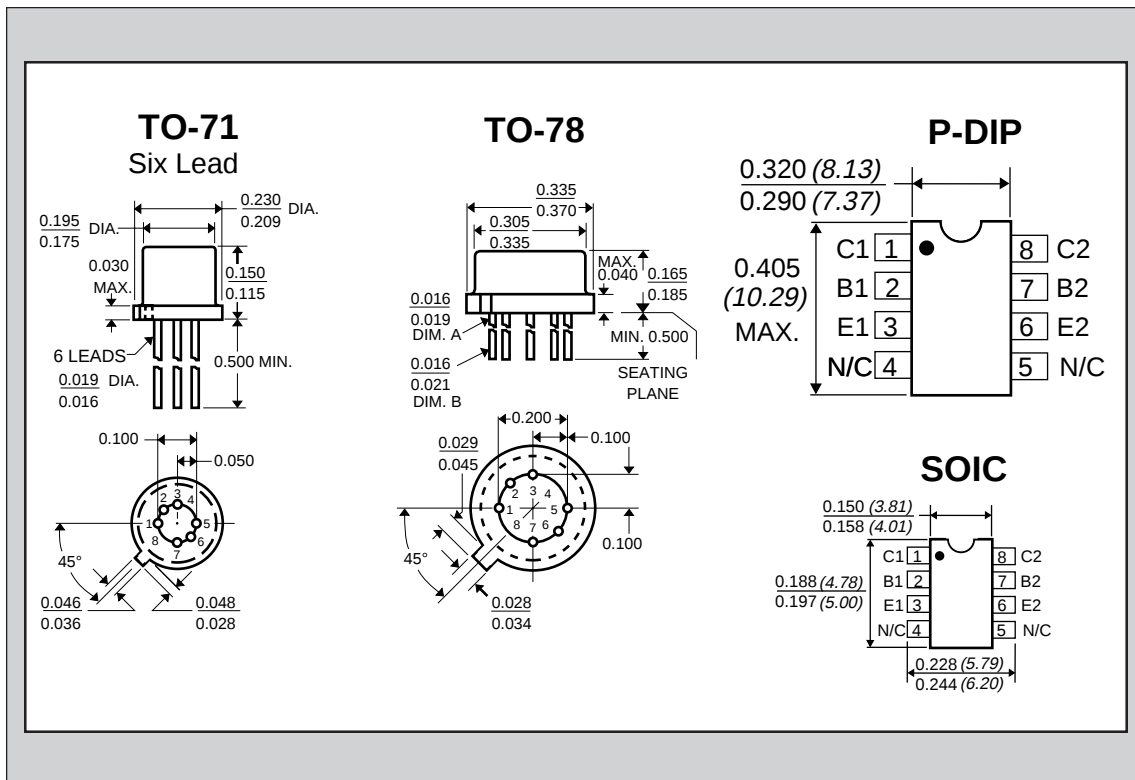
| SYMBOL               | CHARACTERISTICS                        | IT120A | IT120 | IT121 | IT122 |      | UNITS | CONDITIONS                                                                                    |
|----------------------|----------------------------------------|--------|-------|-------|-------|------|-------|-----------------------------------------------------------------------------------------------|
| BV <sub>CBO</sub>    | Collector to Base Voltage              | 45     | 45    | 45    | 45    | MIN. | V     | I <sub>C</sub> = 10μA I <sub>E</sub> = 0                                                      |
| BV <sub>CEO</sub>    | Collector to Emitter Voltage           | 45     | 45    | 45    | 45    | MIN. | V     | I <sub>C</sub> = 10μA I <sub>B</sub> = 0                                                      |
| BV <sub>EBO</sub>    | Emitter-Base Breakdown Voltage         | 6.2    | 6.2   | 6.2   | 6.2   | MIN. | V     | I <sub>E</sub> = 10μA I <sub>C</sub> = 0 <u>NOTE 2</u>                                        |
| BV <sub>CCO</sub>    | Collector to Collector Voltage         | 60     | 60    | 60    | 60    | MIN. | V     | I <sub>C</sub> = 10μA I <sub>E</sub> = 0                                                      |
| h <sub>FE</sub>      | DC Current Gain                        | 200    | 200   | 80    | 80    | MIN. |       | I <sub>C</sub> = 10μA V <sub>CE</sub> = 5V                                                    |
|                      |                                        | 225    | 225   | 100   | 100   | MIN. |       | I <sub>C</sub> = 1.0mA V <sub>CE</sub> = 5V                                                   |
| V <sub>CE(SAT)</sub> | Collector Saturation Voltage           | 0.5    | 0.5   | 0.5   | 0.5   | MAX. | V     | I <sub>C</sub> = 0.5mA I <sub>B</sub> = 0.05mA                                                |
| I <sub>EBO</sub>     | Emitter Cutoff Current                 | 1      | 1     | 1     | 1     | MAX. | nA    | I <sub>C</sub> = 0 V <sub>EB</sub> = 3V                                                       |
| I <sub>CBO</sub>     | Collector Cutoff Current               | 1      | 1     | 1     | 1     | MAX. | nA    | I <sub>E</sub> = 0 V <sub>CB</sub> = 45V                                                      |
| C <sub>OBO</sub>     | Output Capacitance                     | 2      | 2     | 2     | 2     | MAX. | pF    | I <sub>E</sub> = 0 V <sub>CB</sub> = 5V                                                       |
| C <sub>C1C2</sub>    | Collector to Collector Capacitance     | 2      | 2     | 2     | 2     | MAX. | pF    | V <sub>CC</sub> = 0                                                                           |
| I <sub>C1C2</sub>    | Collector to Collector Leakage Current | 10     | 10    | 10    | 10    | MAX. | nA    | V <sub>CC</sub> = ±60V                                                                        |
| f <sub>T</sub>       | Current Gain Bandwidth Product         | 220    | 220   | 180   | 180   | MIN. | MHz   | I <sub>C</sub> = 1mA V <sub>CE</sub> = 5V                                                     |
| NF                   | Narrow Band Noise Figure               | 3      | 3     | 3     | 3     | MAX. | dB    | I <sub>C</sub> = 100μA V <sub>CE</sub> = 5V<br>BW = 200Hz, R <sub>G</sub> = 10 KΩ<br>f = 1KHz |

*Linear Integrated Systems*

4042 Clipper Court, Fremont, CA 94538 • TEL: (510) 490-9160 • FAX: (510) 353-0261

**MATCHING CHARACTERISTICS @ 25°C (unless otherwise noted)**

| SYMBOL                               | CHARACTERISTICS                                           | IT120A | IT120 | IT121 | IT122 |      | UNITS            | CONDITIONS                                                            |
|--------------------------------------|-----------------------------------------------------------|--------|-------|-------|-------|------|------------------|-----------------------------------------------------------------------|
| $ V_{BE1} - V_{BE2} $                | Base Emitter Voltage Differential                         | 1      | 2     | 3     | 5     | MAX. | mV               | $I_C = 10 \mu A$ $V_{CE} = 5V$                                        |
| $\Delta(V_{BE1} - V_{BE2})/\Delta T$ | Base Emitter Voltage Differential Change with Temperature | 3      | 5     | 10    | 20    | MAX. | $\mu V/^\circ C$ | $I_C = 10 \mu A$ $V_{CE} = 5V$<br>$T = -55^\circ C$ to $+125^\circ C$ |
| $ I_{B1} - I_{B2} $                  | Base Current Differential                                 | 2.5    | 5     | 25    | 25    | MAX. | nA               | $I_C = 10 \mu A$ $V_{CE} = 5V$                                        |



**NOTES:**

1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired.
2. The reverse base-to-emitter voltage must never exceed 6.2 volts; the reverse base-to-emitter current must never exceed 10  $\mu A$ .