

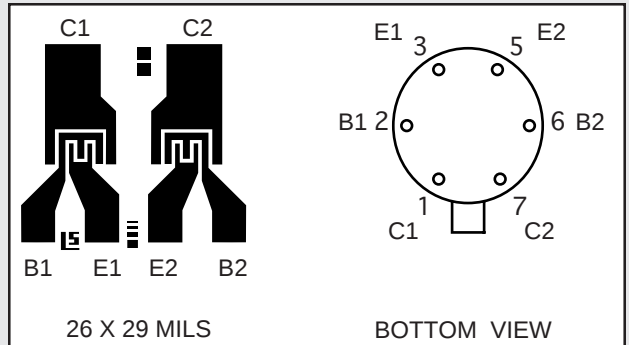
# LINEAR SYSTEMS

*Linear Integrated Systems*

## LS358

### LOG CONFORMANCE MONOLITHIC DUAL PNP TRANSISTORS

| FEATURES                               |                   |                         |
|----------------------------------------|-------------------|-------------------------|
| LOG CONFORMANCE                        |                   | Δre ≤1Ω from ideal TYP. |
| ABSOLUTE MAXIMUM RATINGS <u>NOTE 1</u> |                   |                         |
| @ 25°C (unless otherwise noted)        |                   |                         |
| IC                                     | Collector Current | 10mA                    |
| Maximum Temperatures                   |                   |                         |
| Storage Temperature Range              |                   | -65°C to +200°C         |
| Operating Junction Temperature         |                   | +150°C                  |
| Maximum Power Dissipation              |                   | ONE SIDE                |
| Device Dissipation @ Free Air          |                   | 250mW                   |
| Linear Derating Factor                 |                   | 2.3mW/°C                |
|                                        |                   | BOTH SIDES              |
|                                        |                   | 500mW                   |
|                                        |                   | 4.3mW/°C                |



#### ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

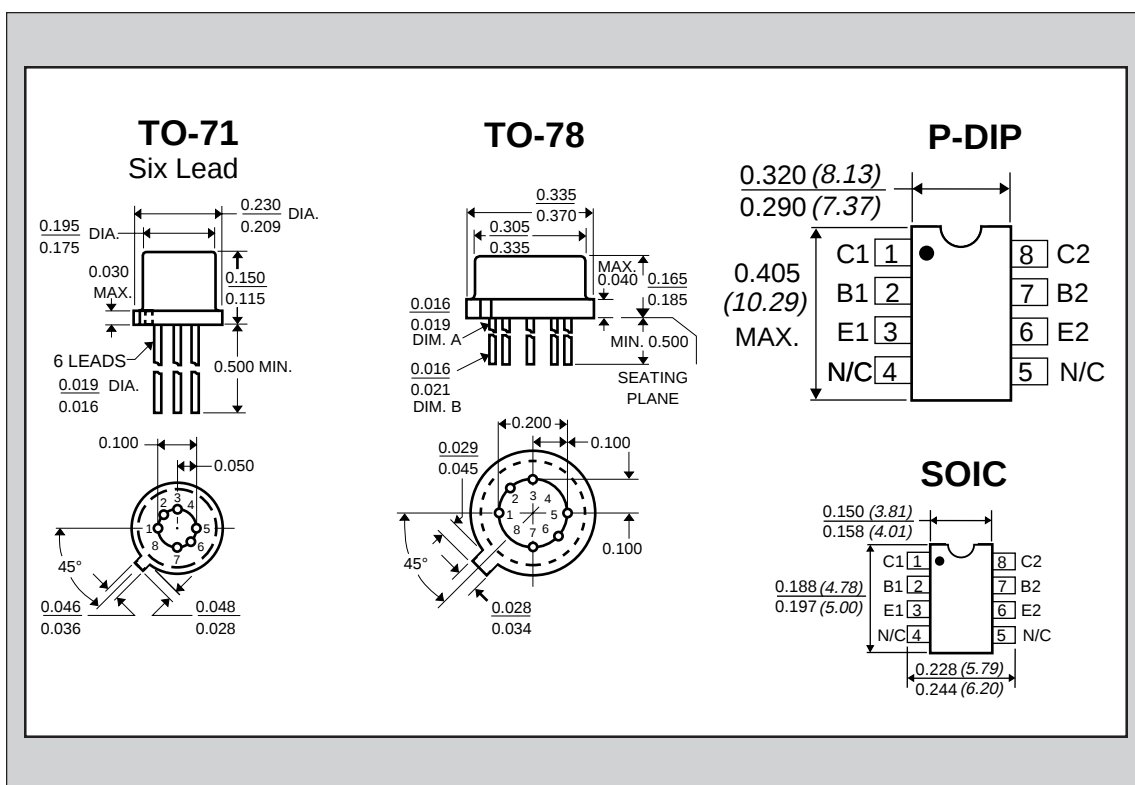
| SYMBOL        | CHARACTERISTICS                        | LS358      |              | UNITS    | CONDITIONS                                                                     |
|---------------|----------------------------------------|------------|--------------|----------|--------------------------------------------------------------------------------|
| $\Delta r_e$  | Log Conformance                        | 1.5        |              | $\Omega$ | $I_C = 10-100-1000\mu A$ $V_{CE} = 5V$                                         |
| $BV_{CBO}$    | Collector-Base Breakdown Voltage       | 20         | MIN.         | V        | $I_C = 10\mu A$ $I_E = 0$                                                      |
| $BV_{CEO}$    | Collector to Emitter Voltage           | 20         | MIN.         | V        | $I_C = 10\mu A$ $I_B = 0$                                                      |
| $BV_{EBO}$    | Emitter-Base Breakdown Voltage         | 6.2        | MIN.         | V        | $I_E = 10\mu A$ $I_C = 0$ NOTE 2                                               |
| $BV_{CCO}$    | Collector to Collector Voltage         | 45         | MIN.         | V        | $I_C = 10\mu A$ $I_E = 0$                                                      |
| $h_{FE}$      | DC Current Gain                        | 100<br>600 | MIN.<br>MAX. |          | $I_C = 10\mu A$ $V_{CE} = 5V$                                                  |
| $h_{FE}$      | DC Current Gain                        | 100<br>600 | MIN.<br>MAX. |          | $I_C = 100\mu A$ $V_{CE} = 5V$                                                 |
| $h_{FE}$      | DC Current Gain                        | 100        | MIN.         |          | $I_C = 1mA$ $V_{CE} = 5V$                                                      |
| $V_{CE(SAT)}$ | Collector Saturation Voltage           | 0.5        | MAX.         | V        | $I_C = 1mA$ $I_B = 0.1mA$                                                      |
| $I_{CBO}$     | Collector Cutoff Current               | 0.2        | MAX.         | nA       | $I_E = 0$ $V_{CB} = 15V$                                                       |
| $I_{EBO}$     | Emitter Cutoff Current                 | 0.2        | MAX.         | nA       | $I_C = 0$ $V_{EB} = 3V$                                                        |
| $C_{OBO}$     | Output Capacitance                     | 2          | MAX.         | pF       | $I_E = 0$ $V_{CB} = 5V$                                                        |
| $C_{C1C2}$    | Collector to Collector Capacitance     | 2          | MAX.         | pF       | $V_{CC} = 0$                                                                   |
| $I_{C1C2}$    | Collector to Collector Leakage Current | 0.5        | MAX.         | nA       | $V_{CC} = \pm 45V$                                                             |
| $f_T$         | Current Gain Bandwidth Product         | 200        | MIN.         | MHz      | $I_C = 1mA$ $V_{CE} = 5V$                                                      |
| NF            | Narrow Band Noise Figure               | 3          | MAX.         | dB       | $I_C = 100\mu A$ $V_{CE} = 5V$<br>$BW = 200Hz$ $R_G = 10K\Omega$<br>$f = 1KHz$ |

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

| SYMBOL                               | PARAMETER                                                 | LS358    |              | UNITS                                | CONDITIONS                                                              |
|--------------------------------------|-----------------------------------------------------------|----------|--------------|--------------------------------------|-------------------------------------------------------------------------|
| $ V_{BE1} - V_{BE2} $                | Base Emitter Voltage Differential                         | 0.4<br>1 | TYP.<br>MAX. | mV<br>mV                             | $I_C = 10 \mu A$ $V_{CE} = 5V$                                          |
| $\Delta(V_{BE1} - V_{BE2})/^\circ C$ | Base Emitter Voltage Differential Change with Temperature | 1<br>10  | TYP.<br>MAX. | $\mu V/^\circ C$<br>$\mu V/^\circ C$ | $I_C = 10 \mu A$ $V_{CE} = 5V$<br>$T_A = -55^\circ C$ to $+125^\circ C$ |
| $ I_{B1} - I_{B2} $                  | Base Current Differential                                 | 5        | MAX.         | nA                                   | $I_C = 10 \mu A$ $V_{CE} = 5V$                                          |
| $ \Delta(I_{B1} - I_{B2}) /^\circ C$ | Base Current Differential Change with Temperature         | 0.5      | MAX.         | nA/°C                                | $I_C = 10 \mu A$ $V_{CE} = 5V$<br>$T_A = -55^\circ C$ to $+125^\circ C$ |
| $h_{FE1}/h_{FE2}$                    | DC Current Gain Differential                              | 5        | TYP.         | %                                    | $I_C = 10 \mu A$ $V_{CE} = 5V$                                          |


**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  $\mu A$ .