

LINEAR SYSTEMS

Linear Integrated Systems

LS350 LS351 LS352

MONOLITHIC DUAL PNP TRANSISTORS

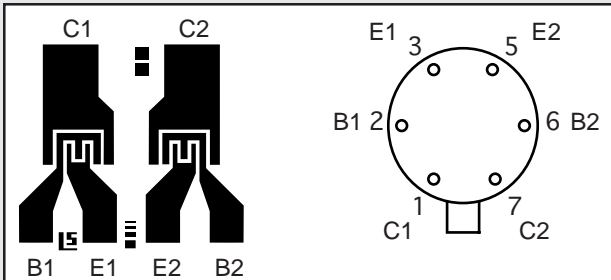
FEATURES

| | |
|---|---|
| HIGH GAIN | $h_{FE} \geq 200$ @ 10 μ A - 1mA |
| TIGHT V_{BE} MATCHING | $ V_{BE1} - V_{BE2} = 0.2\text{mV TYP.}$ |
| HIGH f_T | 275MHz TYP. @ 1mA |

ABSOLUTE MAXIMUM RATINGS NOTE 1

@ 25°C (unless otherwise noted)

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



26 X 29 MILS

BOTTOM VIEW

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

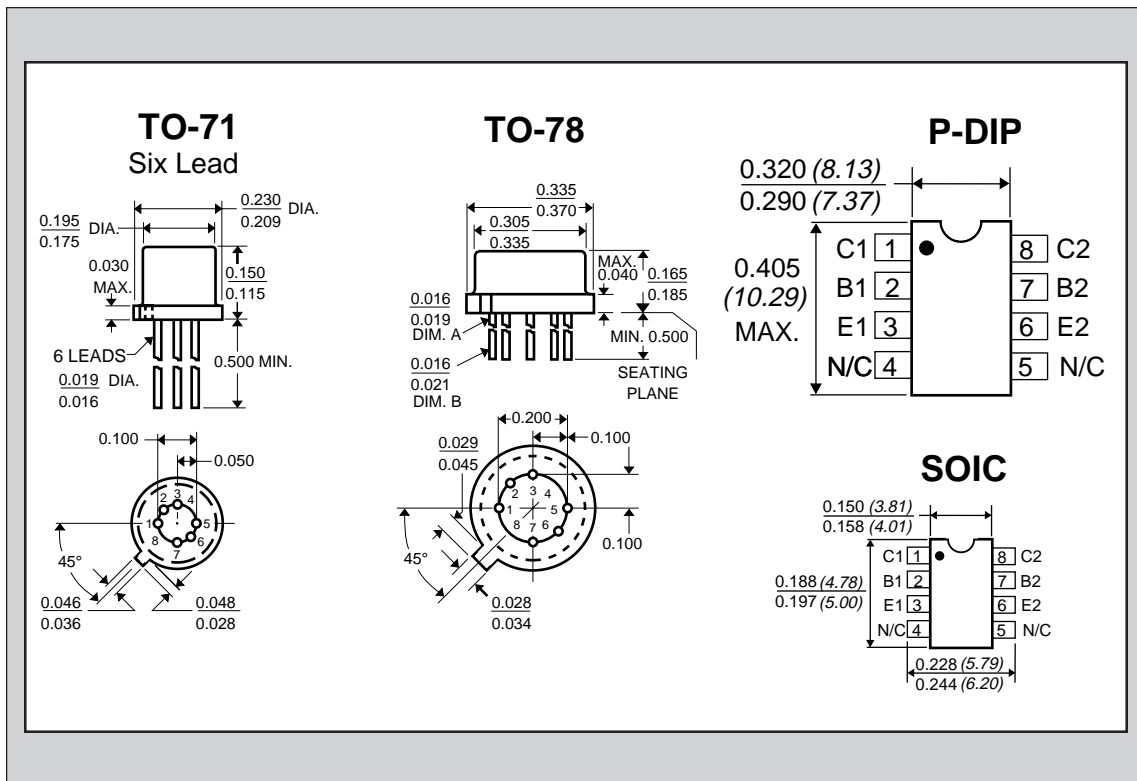
| SYMBOL | CHARACTERISTICS | LS350 | LS351 | LS352 | | UNITS | CONDITIONS |
|---------------|--|-------|------------|------------|--------------|-------|--|
| BV_{CBO} | Collector to Base Voltage | 25 | 45 | 60 | MIN. | V | $I_C = 10\mu\text{A}$ $I_E = 0$ |
| BV_{CEO} | Collector to Emitter Voltage | 25 | 45 | 60 | MIN. | V | $I_C = 10\mu\text{A}$ $I_B = 0$ |
| BV_{EBO} | Emitter to Base Voltage | 6.2 | 6.2 | 6.2 | MIN. | V | $I_E = 10\mu\text{A}$ $I_C = 0$ NOTE 2 |
| BV_{CCO} | Collector to Collector Voltage | 30 | 60 | 100 | MIN. | V | $I_C = 10\mu\text{A}$ $I_E = 0$ |
| h_{FE} | DC Current Gain | 100 | 150 600 | 200 600 | MIN. MAX. | | $I_C = 10\mu\text{A}$ $V_{CE} = 5V$ |
| h_{FE} | DC Current Gain | 100 | 150 600 | 200 600 | MIN. MAX. | | $I_C = 100\mu\text{A}$ $V_{CE} = 5V$ |
| h_{FE} | DC Current Gain | 100 | 150 | 200 | MIN. | | $I_C = 1\text{mA}$, $V_{CE} = 5V$ |
| $V_{CE(SAT)}$ | Collector Saturation Voltage | 0.5 | 0.5 | 0.5 | MAX. | V | $I_C = 1\text{mA}$ $I_B = 0.1\text{mA}$ |
| I_{CBO} | Collector Cutoff Current | 0.2 | 0.2 | 0.2 | MAX. | nA | $I_E = 0$ $V_{CB} = \text{NOTE 3}$ |
| I_{EBO} | Emitter Cutoff Current | 0.2 | 0.2 | 0.2 | MAX. | nA | $I_C = 0$ $V_{EB} = 3V$ |
| C_{OBO} | Output Capacitance | 2 | 2 | 2 | MAX. | pF | $I_E = 0$ $V_{CB} = 5V$ |
| C_{C1C2} | Collector to Collector Capacitance | 2 | 2 | 2 | MAX. | pF | $V_{CC} = 0$ |
| I_{C1C2} | Collector to Collector Leakage Current | 0.5 | 0.5 | 0.5 | MAX. | nA | $V_{CC} = \text{NOTE 4}$ |
| f_T | Current Gain Bandwidth Product | 200 | 200 | 200 | MIN. | MHz | $I_C = 1\text{mA}$ $V_{CE} = 5V$ |
| NF | Narrow Band Noise Figure | 3 | 3 | 3 | MAX. | dB | $I_C = 100\mu\text{A}$ $V_{CE} = 5V$ BW = 200Hz $R_G = 10\text{K}\Omega$ $f = 1\text{KHz}$ |

Linear Integrated Systems

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MATCHING CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | LS350 | LS351 | LS352 | | UNITS | CONDITIONS |
|--------------------------------------|---|-------|-------|-------|------|------------------|---------------------------------------|
| $ V_{BE1} - V_{BE2} $ | Base Emitter Voltage Differential | 1 | 0.4 | 0.2 | TYP. | mV | $I_C = 10 \mu A$ $V_{CE} = 5V$ |
| | | 5 | 1.0 | 0.5 | MAX. | mV | |
| $\Delta(V_{BE1} - V_{BE2})/^\circ C$ | Base Emitter Voltage Differential Change with Temperature | 2 | 1 | 0.5 | TYP. | $\mu V/^\circ C$ | $I_C = 10 \mu A$ $V_{CE} = 5V$ |
| | | 20 | 10 | 2 | MAX. | $\mu V/^\circ C$ | $T_A = -55^\circ C$ to $+125^\circ C$ |
| $ I_{B1} - I_{B2} $ | Base Current Differential | | 5 | 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 | 0.3 | MAX. | $nA/^\circ C$ | $I_C = 10 \mu A$ $V_{CE} = 5V$ |
| | | | | | | | $T_A = -55^\circ C$ to $+125^\circ C$ |
| h_{FE1}/h_{FE2} | DC Current Gain Differential | 10 | 5 | 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 μA .
3. For LS350: $V_{CB} = 20V$; for LS351 & LS352: $V_{CB} = 30V$.
4. For LS351: $V_{CC} = \pm 45V$; for LS352: $V_{CC} = \pm 80V$; for LS350: $V_{CC} = \pm 25V$.