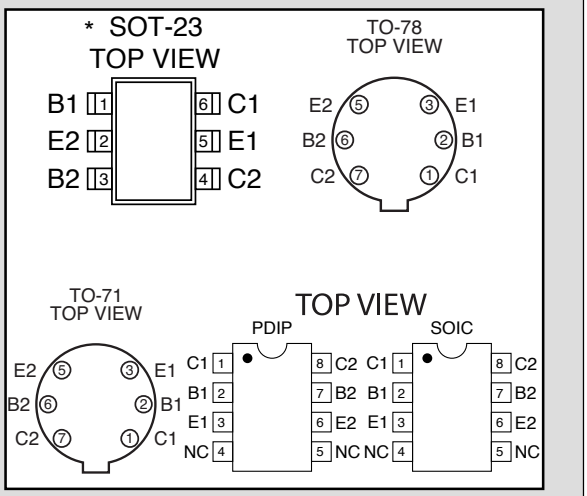
LINEAR SYSTEMS

*Twenty-Five Years Of Quality Through Innovation*

# LS3250 SERIES

## MONOLITHIC DUAL NPN TRANSISTORS

| *FEATURES | |
|---|---|
| 6 LEAD SOT-23 SURFACE MOUNT PACKAGE* | |
| TIGHT MATCHING[1] | 2mV |
| EXCELLENT THERMAL TRACKING[1] | 3µV/°C |
| **ABSOLUTE MAXIMUM RATINGS[2]** @ 25 °C (unless otherwise stated) | |
| **Maximum Temperatures** | |
| Storage Temperature | -55 to +150 °C |
| Operating Junction Temperature | -55 to +150 °C |
| **Maximum Power Dissipation** | |
| Continuous Power Dissipation | TBD |
| **Maximum Currents** | |
| Collector Current | 50mA |
| **Maximum Voltages** | |
| Collector to Collector Voltage | 50V |




**MATCHING ELECTRICAL CHARACTERISTICS @25 °C (unless otherwise stated)**

| SYMBOL | CHARACTERISTIC | LS3250A | | LS3250B | | LS3250C | | UNIT | CONDITIONS |
|---|---|---|---|---|---|---|---|---|---|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | |
| $\lvert V_{BE1} - V_{BE2} \rvert$ | Base to Emitter Voltage Differential | | 2 | | 5 | | 10 | mV | $I_C$ = 10µA , $V_{CE}$ = 5V |
| $\frac{\lvert V_{BE1} - V_{BE2} \rvert}{\Delta T}$ | Base to Emitter Voltage Differential Change with Temperature | | 3 | | 5 | | 15 | µV/°C | $I_C$ = 10µA , $V_{CE}$ = 5V<br>$T_A$ = -40°C to +85°C |
| $\lvert I_{B1} - I_{B2} \rvert$ | Base Current Differential | | 10 | | 10 | | 10 | nA | $I_C$ = 10µA, $V_{CE}$ = 5V |
| $\frac{\lvert I_{B1} - I_{B2} \rvert}{\Delta T}$ | Base Current Differential Change with Temperature | | 0.5 | | 0.5 | | 1.0 | nA/°C | $I_C$ = 10µA, $V_{CE}$ = 5V<br>$T_A$ = -40°C to +85°C |
| $h_{FE1}/h_{FE2}$ | Current Gain Differential | | 10 | | 10 | | 15 | % | $I_C$ = 1mA, $V_{CE}$ = 5V |

**ELECTRICAL CHARACTERISTICS @25 °C (unless otherwise stated)**

| SYMBOL | CHARACTERISTIC | LS3250A | | LS3250B | | LS3250C | | UNIT | CONDITIONS |
|---|---|---|---|---|---|---|---|---|---|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | |
| $BV_{CBO}$ | Collector to Base Breakdown Voltage | 45 | | 40 | | 20 | | V | $I_C$ = 10µA , $I_E$ = 0A |
| $BV_{CEO}$ | Collector to Emitter Breakdown Voltage | 45 | | 40 | | 20 | | | $I_C$ = 10mA, $I_B$ = 0 |
| $BV_{CCO}$ | Collector to Collector Breakdown Voltage | ±50 | | ±50 | | ±50 | | | $I_C$ = ±1µA, $I_E$ = $I_B$= 0A |
| $BV_{EBO}$ | Emitter to Base Breakdown Voltage[3] | 6.0 | | 6.0 | | 6.0 | | | $I_E$ = 10µA, $I_C$ = 0A |
| $V_{CE(SAT)}$ | Collector to Emitter Saturation Voltage | | 0.35 | | 0.35 | | 1.2 | | $I_C$ = 10mA, $I_B$ = 1mA |

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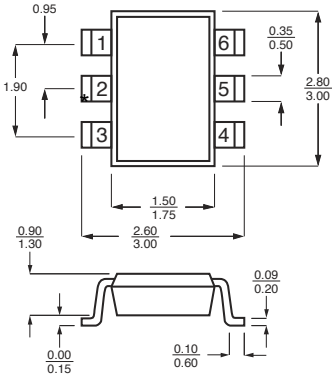
1/31/12 Rev#A4 ECN# LS 3250

**ELECTRICAL CHARACTERISTICS CONT. @25 °C (unless otherwise stated)**

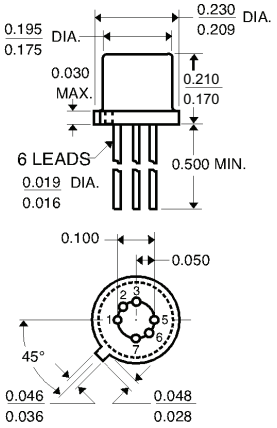
| SYMBOL | CHARACTERISTIC | LS3250A | | LS3250B | | LS3250C | | UNIT | CONDITIONS |
|---|---|---|---|---|---|---|---|---|---|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | |
| $h_{FE}$ | DC Current Gain | 150 | | 100 | | 50 | | | $I_C$ = 1mA, $V_{CE}$ = 5V |
| | | 150 | 650 | 80 | | 40 | | | $I_C$ = 10mA, $V_{CE}$ = 5V |
| | | 125 | | 60 | | 30 | | | $I_C$ = 35mA, $V_{CE}$ = 5V |
| $I_{CBO}$ | Collector Cutoff Current | | 0.35 | | 0.35 | | | | $I_E$ = 0A, $V_{CB}$ = 30V |
| | | | | | | | 0.2 | nA | $I_E$ = 0A, $V_{CB}$ = 20V |
| $I_{EBO}$ | Emitter Cutoff Current | | 0.35 | | 0.35 | | 0.35 | | $I_E$ = 0A, $V_{CB}$ = 3V |
| $I_{C1C2}$ | Collector to Collector Leakage Current | | ±1 | | ±1 | | ±1 | µA | $V_{CC}$ = ±50V, $I_E$ = $I_B$= 0A |
| $C_{OBO}$ | Output Capacitance | | 2 | | 2 | | 2 | pF | $I_E$ = 0A, $V_{CB}$ = 10V |
| $f_T$ | Gain Bandwidth Product (Current) | | 600 | | 600 | | 600 | MHz | $I_C$ = 1mA, $V_{CE}$ = 5V |
| NF | Noise Figure (Narrow Band) | | 3 | | 3 | | 3 | dB | $I_C$ = 100µA, $V_{CE}$ = 5V<br>BW = 200Hz<br>$R_B$ = 10Ω, *f* = 1kHz |

## SOT-23

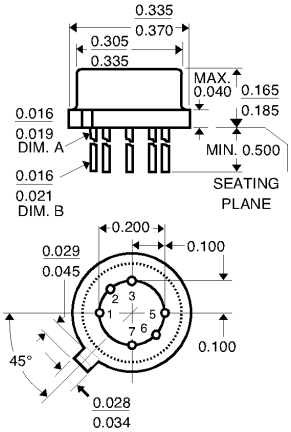



## TO-71

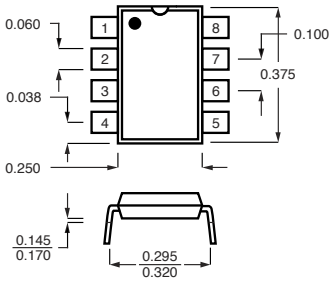
Six Lead



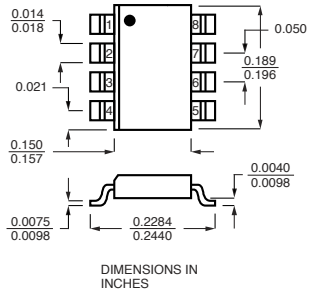

## TO-78




## PDIP




## SOIC




* Standard package is SOT23 6 lead.
Other packages listed are optional. Contact factory regarding availability of optional packages.

## NOTES:

1. Maximum rating for LS3250A, SOT23-6.
2. Absolute maximum ratings are limiting values above which serviceability may be impaired.
3. The reverse Base to Emitter voltage must never exceed 6.0 Volts. The reverse Base to Emitter current must never exceed 10µA.



**Linear Integrated Systems (LIS) is a 25-year-old, third-generation precision semiconductor company providing high-quality discrete components. Expertise brought to LIS is based on processes and products developed at Amelco, Union Carbide, Intersil and Micro Power Systems by company President John H. Hall. Hall, a protégé of Silicon Valley legend Dr. Jean Hoerni, was the director of IC Development at Union Carbide, co-founder and vice president of R&D at Intersil, and founder/president of Micro Power Systems.**

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