LINEAR SYSTEMS

Twenty-Five Years Of Quality Through Innovation

LS301 LS302 LS303

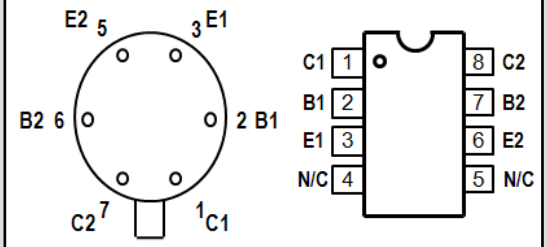
HIGH VOLTAGE SUPER-BETA MONOLITHIC DUAL NPN TRANSISTORS

FEATURES	
VERY HIGH GAIN	h_{FE} 2000 @ 1.0µA TYP.
LOW OUTPUT CAPACITANCE	C_{OBO} 2.0pF
TIGHT V_{BE} MATCHING	$\|V_{BE1}-V_{BE2}\|$=0.2mV TYP.
HIGH f_T	100 MHz

ABSOLUTE MAXIMUM RATINGS NOTE 1 @ 25 °C (unless otherwise stated)		
I_C	**Collector Current**	**5mA**

Maximum Temperatures	
Storage Temperature	-55 to +150 °C
Operating Junction Temperature	-55 to +150 °C

Maximum Power Dissipation	ONE SIDE	BOTH SIDES
Device Dissipation @ Free Air	250mW	500mW
Linear Derating Factor	2.3mW/°C	4.3mW/°C



Top View TO-71 & TO-78

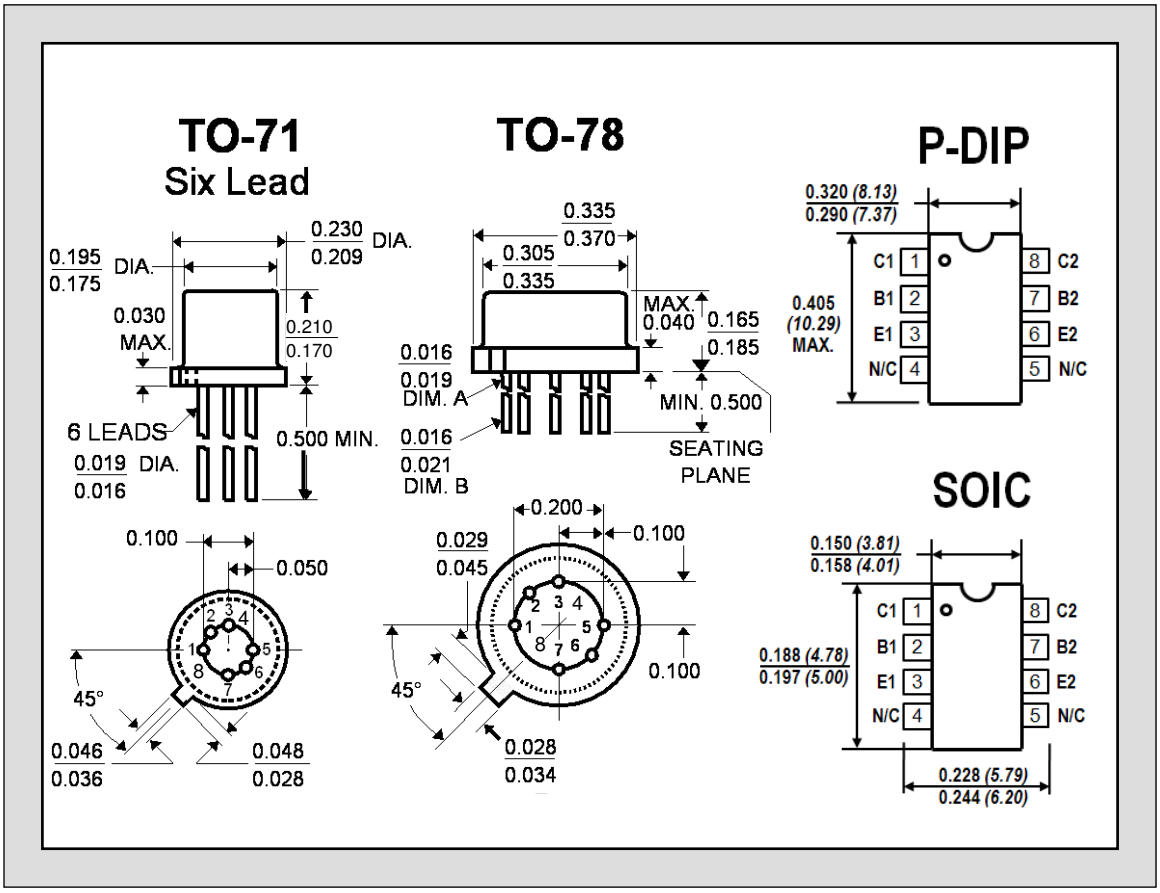
Top View SOIC

ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated)

SYMBOL	CHARACTERISTIC	LS301	LS302	LS303		UNITS	CONDITIONS
BV_{CBO}	Collector to Base Voltage	18	35	10	MIN.	V	I_C = 10µA I_E = 0
BV_{CEO}	Collector to Emitter Voltage	18	35	10	MIN.	V	I_C = 1mA I_B = 0
BV_{EBO}	Emitter-Base Breakdown Voltage	6.0	6.0	6.0	MIN.	V	I_E = 10µA I_C = 0 NOTE 2
BV_{CCO}	Collector To Collector Voltage	80	80	20	MIN.	V	I_C = 1µA $I_E = I_B$ = 0
h_{FE}	DC Current Gain	2000	1000	2000	TYP.		I_C = 1µA V_{CE} = 5V
h_{FE}	DC Current Gain	2000	1000	2000	MIN.		I_C = 10µA V_{CE} = 5V
h_{FE}	DC Current Gain	2000	1000	2000	TYP.		I_C = 500µA V_{CE} = 5V
V_{CE}(SAT)	Collector Saturation Voltage	0.5	0.5	0.5	MAX.	V	I_C = 1mA I_B = 0.1mA
I_{CBO}	Collector Cutoff Current	100	100	100	MAX.	pA	I_E = 0 V_{CB} = NOTE 3
I_{EBO}	Emitter Cutoff Current	0.2	0.2	0.2	MAX.	pA	I_E = 0 V_{EB} = 3V
C_{OBO}	Output Capacitance	2	2	2	MAX.	pF	I_E = 0 V_{CB} = 1V
C_{C1C2}	Collector to Collector Capacitance	2	2	2	MAX.	pF	V_{CC} = 0
I_{C1C2}	Collector to Collector Leakage Current	1.0	1.0	1.0	MAX.	µA	V_{CC} = NOTE 4, $I_E = I_B$ = 0
f_T	Current Gain Bandwidth Product	100	100	100	MIN.	MHz	I_C = 200µA V_{CE} = 5V
NF	Narrow Band Noise Figure	3	3	3	MAX.	dB	I_C = 10µA V_{CE} = 3V BW = 200Hz R_G = 10K f = 1KHz

MATCHING CHARACTERISTICS

SYMBOL	CHARACTERISTIC	LS301	LS302	LS303		UNITS	CONDITIONS
$\lvert V_{BE1}-V_{BE2}\rvert$	Base Emitter Voltage Differential	0.2	0.2	0.2	TYP.	mV	I_C = 10µA V_{CE} = 5V
		1	1	1	MAX.	mV	
$\lvert\Delta(V_{BE1}-V_{BE2})\rvert/\Delta$℃	Base Emitter Voltage Differential	1	1	1	TYP.	µV/℃	I_C = 10µA V_{CE} = 5V
	Change with Temperature	5	5	5	MAX.	µV/℃	T = 55℃ to +125℃
$\lvert I_{B1}- I_{B2}\rvert$	Base Current Differential	0.5	1	0.5	TYP.	nA	I_C = 10µA V_{CE} = 1V
		1	5	1.5	MAX.	nA	I_C = 10µA V_{CE} = 5V
h_{FE1}/h_{FE2}	DC Current Gain Differential	5	5	5	TYP.	%	I_C = 10µA 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 6.0 volts; the reverse base-to-emitter current must never exceed 10 µAmps.
3. For LS301 & LS302: V_{CB}=10V; for LS303: V_{CB}=5V
4. For LS301 & LS302: V_{CC}=±80V; for LS303: V_{CC}=±20V

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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